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爆薬の爆轟特性解析

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化学技術研究所

Detonation Properties of Condensed Explosives Computed Using the Kihara-Hikita-Tanaka Equation of State

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序

本報告は木研究成果のまとめと基礎的なデータの取得を目的とした爆速に対して式（ＪＡＮＡＦ他）を用いる事により応用が可能となった。

以上は欧米の状態式に対して我国良好な生成物の選び方等を変えなければ良い一致が得られない事がわかった。また産業用爆薬は理想的な爆轟をしないため解析結果とは一致しない。

今後は最も多く使われている爆薬ＫＨＴ（高温定容爆発熱量）について測定した爆速値と計算値との誤差を検討し，ＣＨＮＯ爆薬に対しても理想気体の理論を用いる事により応用が可能となった

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総　論

Detonation Properties of Condensed Explosives Computed by Kihara-Hikita-Tanaka Equation of State

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Abstract

A study on the equation of state called KHT for the calculation of detonation properties has been performed using repulsive intermolecular potential transformed into PVT-equation of state. Calculated results give the favorable agreements with experiment by assuming the highly compressible equation of state of solid carbon. KHT calculations show the similar results with Mader's BKW calculation except the aluminized explosives with nonideal nature and water-in-oil emulsion explosives containing large amount of ammonium nitrate with ideal nature. For the comparison, the BKW calculations have been performed using the equation of state of solid carbon and thermodynamic data in KHT calculation.

1. Introduction

We propose the equation of state which is revised the Kihara-Hikita [1] equation of state to calculate the detonation properties of high explosives. Calculated results are compared with those of experiments and BKW calculation by Mader [2] whose calculations have been compiled for the various detonation properties of many explosives.

There are many types of equations of state to calculate the detonation properties of high explosives. Kihara and Hikita, in 1952, have derived the equation of state of gases based on the intermolecular potential equation of Lennard-Jones-Devonshire type neglecting attractive term. The equation of state proposed by Kihara and Hikita has the following form

$$\frac{Pv}{kT} = \frac{1 + ax + bx^2 + cx^3}{1 - \alpha x} \quad \text{,where } x = \left(\frac{\lambda}{Pv}\right)^{3/n} \frac{1}{v} \qquad (1)$$

The Kihara-Hikita equation of state constants have been determined for the experimental detonation velocities of pentaerithritol tetranitrate(PETN). After their studies, Tanaka and Hikita [3] have applied the K-H equation of state to various explosives. The calculated results reproduced the experimental data. However at higher densities near the crystal , calculated detonation velocities are higher and

pressures are lower than those of experimental data. Especially, for carbon rich explosives like TNT, disagreement of calculated results were significant. The several detonation scientists have attributed the disagreements to the problem of the validity of the equation of state. The author [4] have tried to get more reproducible equation of state for the calculation of detonation properties. Recently Mader [5] and his coworkers [6] in Los Alamos Laboratory have reported about the failure of the classical Chapman-Jouget theory and about the formation of gaseous carbon in the detonation products instead of solid carbon. Their reports are interesting because, in our KHT calculation , solid detonation products including the case of aluminized explosives give significant effects on the detonation properties.

In this report,we have described about the result of calculations using the KHT and BKW equation of state.

2. Derivation of the Kihara-Hikita-Tanaka Equation of State

(i) Basic Equations

Using a repulsive potential of the form $\phi = \lambda / r^n$ where r is the distance between atoms or molecules, intermolecular potential equation may be written in the form

$$\phi = \frac{\lambda}{\left(\frac{6\sigma}{\pi} v\right)^{n/3}} \qquad (2)$$

where σ is the packing ratio and v is the volume occupied by one molecule or atom.

If it is assumed that istotherm at zero degree Kelvin, $P_c(v)$, can be derived from $P_c(v) = -(\partial\phi/\partial v)_T$, we can get the equation

$$P_c(v) = \frac{\frac{n}{3}\lambda}{\left(\frac{6\sigma}{\pi}\right)^{n/3} v^{1+n/3}} \qquad (3)$$

Equation(3) can be simplified to the form,

$$\alpha x = 1 \text{ , where } x = \left(\frac{\lambda}{Pv}\right)^{3/n} \frac{1}{v} \text{ , } \alpha = \left(\frac{n}{3}\right)^{3/n} \frac{\pi}{6\sigma} \qquad (4)$$

$1/\alpha$ is closely related to the limit of the compression. Let assume that the P-V-T relation can be written in the form

$$\frac{Pv}{kT} = \frac{f(x)}{1 - \alpha x} \qquad (5)$$

where k denots the Boltzman constant.

Then the internal energy E can be derived from classical thermodynamic theory, resulting in the form

$$E = E^\circ(T) + \frac{3}{n}(PV - RT) \qquad (6)$$

where E° is the internal energy of the ideal state per mole . Equation(6) is useful because it is independent of the form of f(x) .

(ii) Determination of the Equation of State Constants

First, we must determine the form of f(x) in equation(5). Let $\lim_{n\to\infty} (\lambda/Pv)^{3/n} = B$, then we get x=B/v and equation(5) can be transformed into $P(V - \alpha B)/RT = f(B/V)$ that is similar to virial equation of state. Therefore, although f(x) is arbitrary function, it may be appropriate in the form

$$f(x) = 1 + ax + bx^2 + cx^3 + dx^4 + ex^5 \qquad (7)$$

To determine the equation of state constants, the use of equation(6) with experimental Hugoniots of liquid nitrogen and other cryogenic gases may be convenient because in a parameter study of K-H-T equation of state one can find the Hugoniot temperatures to known experimental Hugoniot state of pressures and volemes under a fixed value of only a constant n. Using the obtained results of a set of P-V-T,

the constants of a,b,c,d e and α are determined to represent a single curve for several experimental Hugoniots in which the each constant of λ_i are determined for the fixed value of n.

Resulted parameters in the KHT equation of state are shown in Table 1 and Fig.1 . Calculated Hugoniots of detonation products are shown in Fig.2 to Fig.11 . For CO_2,we used lower value of λ(=14) than Hugoniot fitting value of λ (=15.5 , Fig.2) which reproduces favorably the detonation properties except the C-N-O explosives independent of existence of the formation of solid carbon. For C-N-O explosives, Hugoniot fitting value reproduces the detonation properties favorably. A difficulty exists for the estimation of the constant of carbon monooxide which could be decomposed into solid carbon and CO_2. The constant of carbon monooxide is set to same value of nitrogen which has similar properties with carbon monooxide. The calculated results of Hugoniot for liquid carbon monooxide are shown in Fig. 3 with experimental results of Nellis et al [7].

(iii) Solid Equation of State

We must determine the equation of state of solids

before the analysis, especially for the solid carbon. We used the Mie-Gruneisen equation of state in the form

$$P_c(V) = P_c(V) + \frac{\Gamma}{V}(E - E_c(V)) \qquad (8)$$

where subscript c denotes isotherm at the zero degree Kelvin .

To get the $P_c(V)$ from measured Hugoniot curves to various porosity, we must estimate the Hugoniot temperature to calculate the thermal expansion of volume. We used Walsh-Christian equation of calculation of Hugoniot temperature in solid with JANAF thermotables . Calculated results for solid carbon, aluminum and alumina are shown in Fig.12 to Fig.15 . There are little effects of porosity for measured Hugoniots for pressure-volume relation to a solid carbon. As it is possible to select two shock Hugoniots of solid carbon (curve A or B in Fig.12) due to a phase transition to the diamond , we calculated the detonation properties using either of them. Calculated results of detonation properties have shown different manners for each Hugoniot curves. However unfortunately both of two curves give higher detonation velocity and pressure for TNT than experimental values. It seems that this situation for the problem of the equation of state of solid carbon as the detonation products may be same as the case of BKW calculation [2]. Similar results are obtained even if KHT equation of state constants are changed . Any TNT fitting

parameter gives lower detonation velocity and pressure for RDX,PETN and some of other explosives than experimental values. Then we assumed various equation of state independent of experimental Hugoniot of solid carbon to get reproducible results . As the result , we have found that the curve labeled KHT in Fig. 12 , in the form

$$P_c(V) = 0.450653 + 4.17309\ V - 34.8893\ V^2 + 76.0323\ V^3 - 54.2024\ V^4 \quad , \quad (9)$$

where P(Mbar) and V(cm^3/g) with $\frac{\Gamma}{V} = 0.48\ (g/cm^3)$, reproduces the detonation properties well as shown in Table 2. The applicability of equation (9) to BKW calculation will be discussed . Equation (9) has considerably higher compressibility than that of Mader and other workers. We cannot confirm the physical and chemical meanings of equation (9). However, we have found that this equation is applicable to most of other explosives including carbon-rich explosives in KHT calculation as shown in Table 3. Using equation (9), a Hugoniot of carbon monooxide was calculated as shown in Fig.3 . The comparison with experimental result by Nellis et al [7] shows good agreement for the case of equilibrium decomposition of CO_2-CO-C(solid) in Fig. 3 as Mader's calculation assuming also decomposition of liquid carbon monooxide .

The favorable reproducibility of equation (9) to

detonation properties may be related with suggestion by Mader [5] who has studied the effects of C_1 ,C_2 or other carbon gases. In our calculation, highly endothermic nature of carbon gases as C_1,C_2 and C_5 reduces the detonation temperature considerably.

It is interesting that Nellis et al [7] have suggested a formation of diamonds in shocked carbon monooxide from their experimetal data. Also, peculiar behaviours of solid detonation products will be shown in next section.

3 Calculated Results

Calculated results are summarized in Table 3 with BKW results by Mader labeled(M) [2),5)] and by the author labeled(T). Also, the calculated results of detonation velocities and pressures for PETN,RDX,TNT and for tetryl are shown in Fig. 16 to Fig. 19 to initial densities. The potential index n is set to 9 for our calculation. While in LJD, n is generally 6 corresponding to α of the BKW constnt of 0.5, lower values near n=6 gives low detonation temperatures and cannot reproduce the detonation velocities and pressures for explosives of low initial densities because of neglecting the attractive term of the intermolecular potential . Calculations are performed using BKW code programmed by Mader[8)]. While, in the BKW code, Mader has used his own thermodynamic data and the heat of formation of explosives at zero degree Kelvin, we have used the JANAF thermotables and heat of formation at 298.15 K (ΔH_f°) under the assumption of $E_0 = \Delta H_f^\circ$. Some of the thermodynamic data used are polynominal by Gordon et al [9)] and others are fitted the data summerized in JANAF tables and Kelley's table [10)]. Due to the different thermodynamic systems used and computor machine, we have obtained slightly different results from Mader's calculation even if Mader's

original code [8)] is used.

It must be noted that used computor machine, FACOM M-200, which is IBM compatible , has 32 bits/word and generate the machine error in fifth or sixth order. The search of Chapman-Jouget point is performed by the condition of convergence that minimum detonation velocity corresponding to C-J state may be defined within the range of 0.1 (or 1.0) m/sec . This condition generates the errors of C-J pressures and temperatures about one percent or less.

The comparison with experiments shown in Table 3 represents the significant deviations in C-N-O explosives and aluminized explosives. As shown in Table 4, for C-N-O explosives, detonation properties may be reproduced favorably by changing the value of CO_2 constant λ = 14 to 15.5 which fits the measured Hugoniots as shown in Fig.2 It is interesting that the Mader have indicated that the reproducible detonation properties of C-N-O explosives are obtained changing a covolume in BKW to higher value.

Aluminized explosives are specified into ideal explosives by Mader [5),6a)]. However, in our calculation, aluminized explosives may be specified into nonideal explosives as shown in Table 5. Due to decrease of volume caused by formation of Al_2O_3, calculated results give higher temperatures but lower detonation velocities than the case for nonreactive aluminum which gives agreements with

experimental results of detonation velocities and pressures. Same results are shown in the case of BKW calculation by author (Table 5). Other metal loaded high explosives of lead or tungsten represent non ideal features as already shown by Mader (Table 5). Also, single compounds having the metal element such as lead azide show similar behaviour in which measured detonation velocities are higher and pressures are considerably lower than those of calculated results.

Also, we have performed the calculation of explosives containing ammonium nitrate in Table 5. As indicated by Mader [6a], these explosives are non ideal. Calculated detonation velocity and pressures are considerably higher comparing with experiments. Mader et al suggested that the reaction of ammonium nitrate is incomplete at the detonation front. It is true for KHT calculation too . However, recent studies of water-in oil type emulsion explosives containig over saturated ammonium nitrate (about 75 wt.%) with micro glassbaloon revealed the ideal feature as shown in Table 5. as the exception to non- ideal nature of ammonium-nitrate explosives.

The isentrope through C-J point is shown in Fig.20 which represents favorable agreement with experimental results.

4 Conclusion

It seems to us that efforts to get the equation of state to reproduce the detonation properties for all kinds of high explsosives will not be fruitful as far as based on the C-J theory. Our interests tend to the analysis of industrial explosives with high accuracy. Industrial explosives contain large amounts of ammonium nitrate or nitrate salts or aluminum and most of them are non-ideal. We require the information about reaction kinetics or mechanism of detonation initiation or propagation through the explosives. However, C-J calculation is still useful . The KHT equation of state,also the BKW too, reproduce the detonation properties within maximum errors of 200 m/sec in detonation velocity and maximum errors in 30 kbar in pressure for ideal explosives.

Our study about the calculation of detonation properties have agreed with most part of Mader's study except the reactivity of aluminum in the explosives. However, while sophisticated equation of state of solid carbon has been successful to KHT, attempts to apply this equation of state of solid carbon to BKW do not give the favorable result in expected manner in comparison with Mader's original results [2] as shown in Table 3 . It may be likely due to the low C-J temperature for BKW calculation.

Reference

1) Kihara,T. and Hikita,T. *Fourth Symp.(International) on Combustion*,458(1953)

2) Mader,C.L.,*Detonation Properties of Condensed Explosives ; Computed Using BKW Equation of State*, Los Alamos Scientific Laboratory Report LA-2900(1963)

3) Tanaka,K. and Hikita,T. *Kogyo Kayaku*, 36 ,210 (1975)

4) Tanaka,K. *ibid* , 43 ,239(1982) ; 43 ,335(1982)

5) Mader,C.L., *Numerical Modeling of Detonations* ,Univ.California Press (1979)

6) a) Mader,C.L., LA-5864(1975)

b) Mader,C.L.,*et al* LA-5865(1975)

c) Craig,B.G.,*et al* LA-6585-MS(1976)

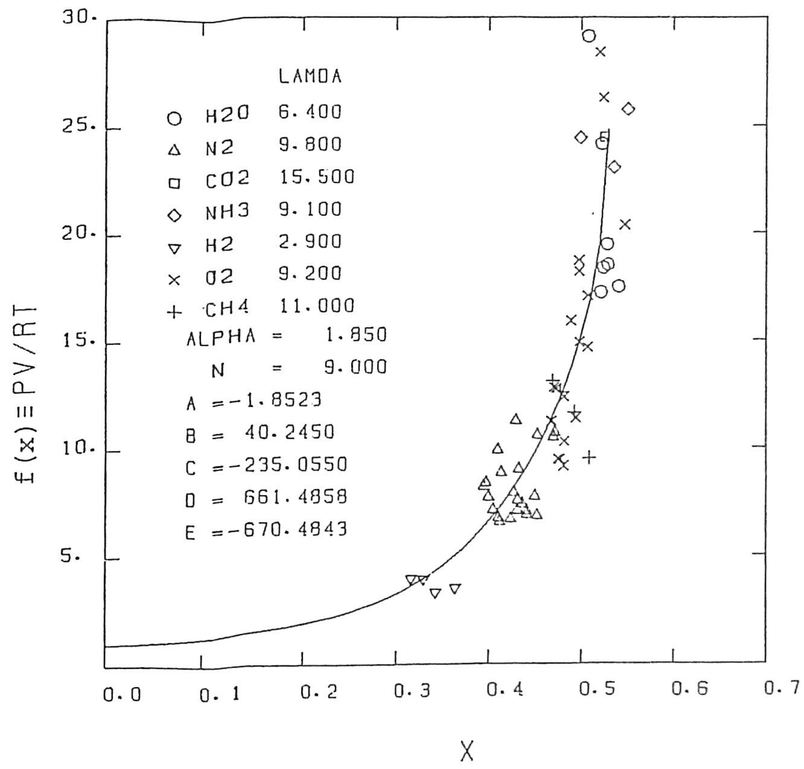
d) Craig,B.G.,*et al* LA-7140(1978)

7) Nellis,W.J. *et al* ,*J.Chem.Phys.*, 75 ,3055,(1981)

8) Mader,C.L., LA-3704(1967)

9) Gordon,S. and McBride,B.J., NASA SP-273

10) Kelley,K.K., *Bur.Mines,Bullelin* 584 (1960) ; *ibid* 592 (1961)



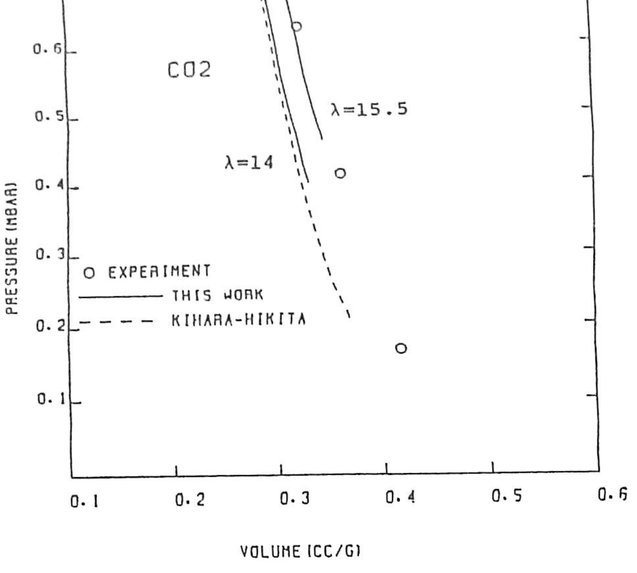


Fig. 2
λ=14 for the best fit to experimental detonation properties except CNO explosives.
Experiment by Zubarev.

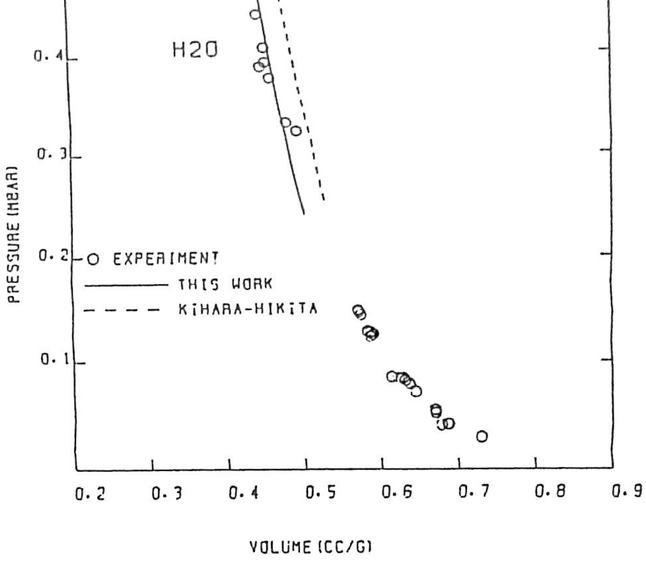


Fig. 4
Calculated Hugoniot of water.
Experiment by van Thiel Walsh, Rice.

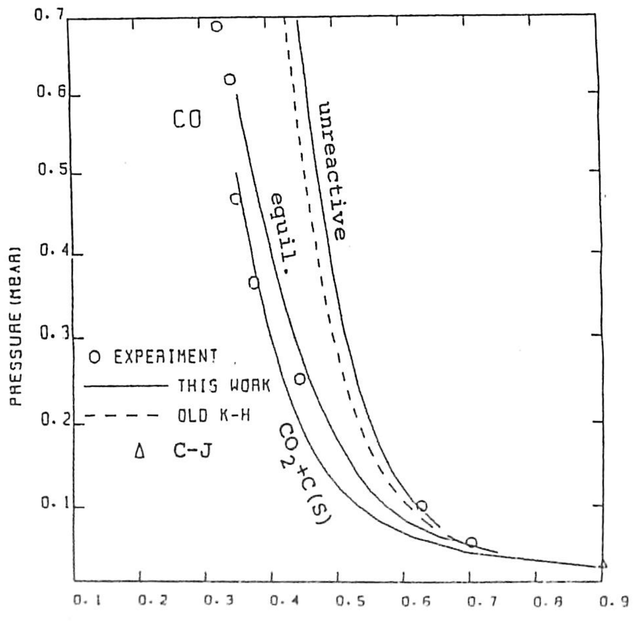


Fig. 3
Calculated Hugoniot of liquid carbon monooxide.
Experiment by Nellis.

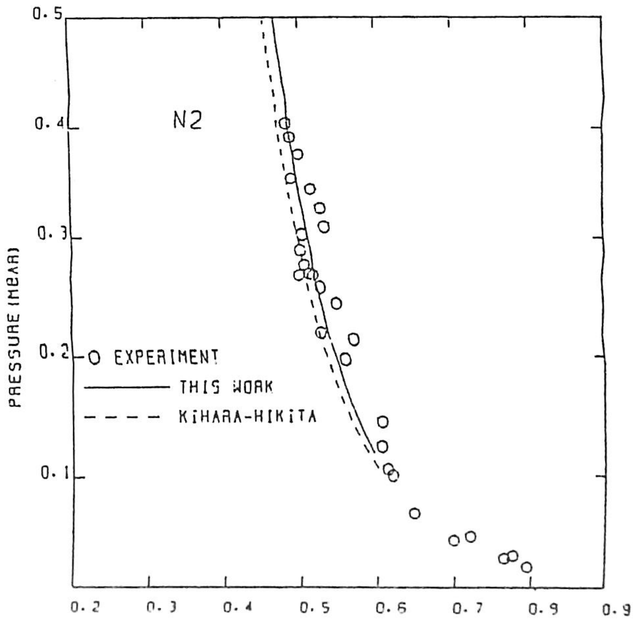


Fig. 5
Calculated Hugoniot of liquid nitrogen.
Experiment by Dick.

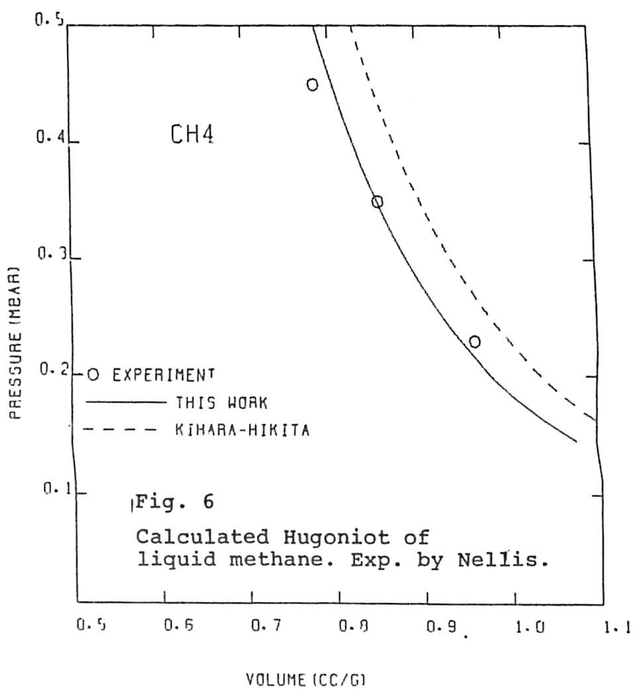


Fig. 6
Calculated Hugoniot of liquid methane. Exp. by Nellis.

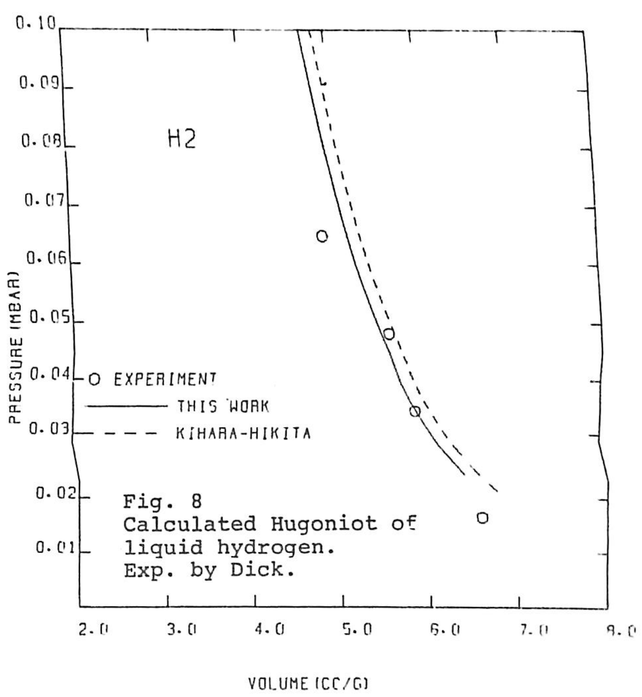


Fig. 8
Calculated Hugoniot of liquid hydrogen.
Exp. by Dick.

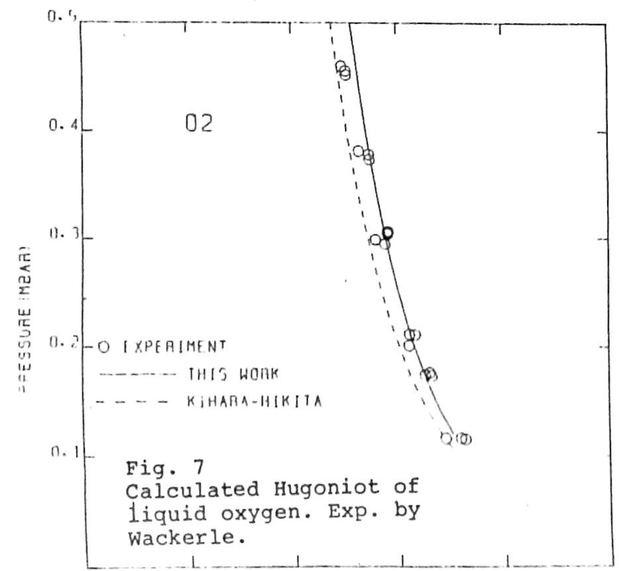


Fig. 7
Calculated Hugoniot of liquid oxygen. Exp. by Wackerle.

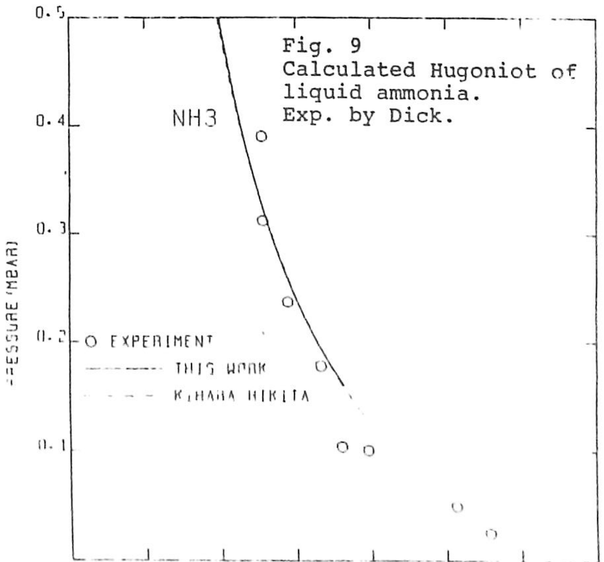


Fig. 9
Calculated Hugoniot of liquid ammonia.
Exp. by Dick.

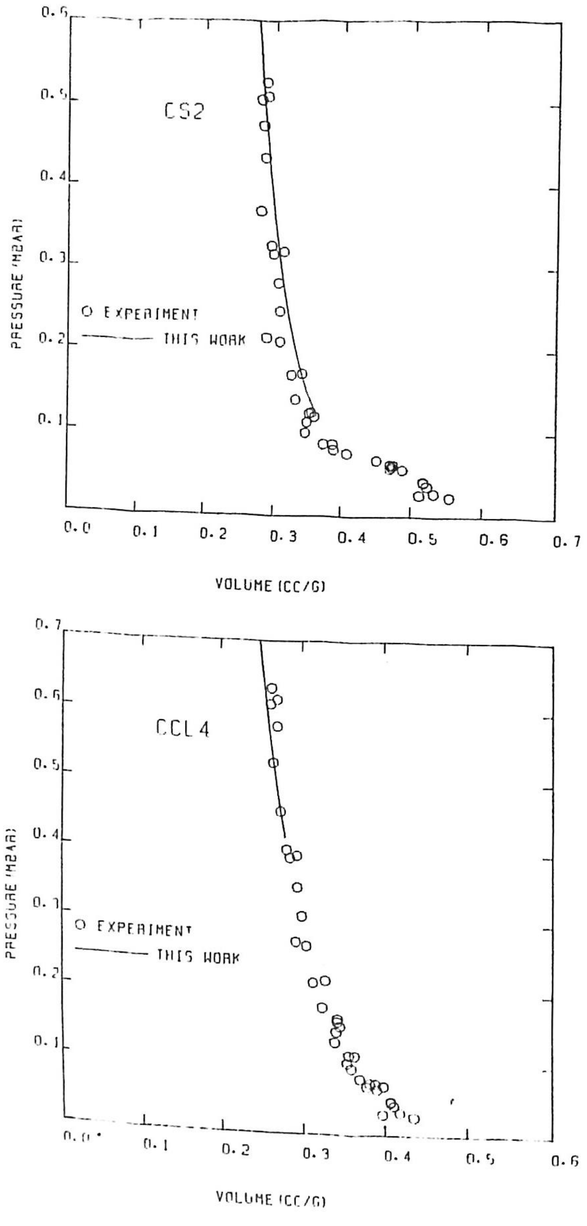


Fig. 10
Calculated
Hugoniot of
carbon disulfide.
Exp. by Dick

Fig. 11
Calculated
Hugoniot of
carbon tetrachloride.
Exp. by Dick.

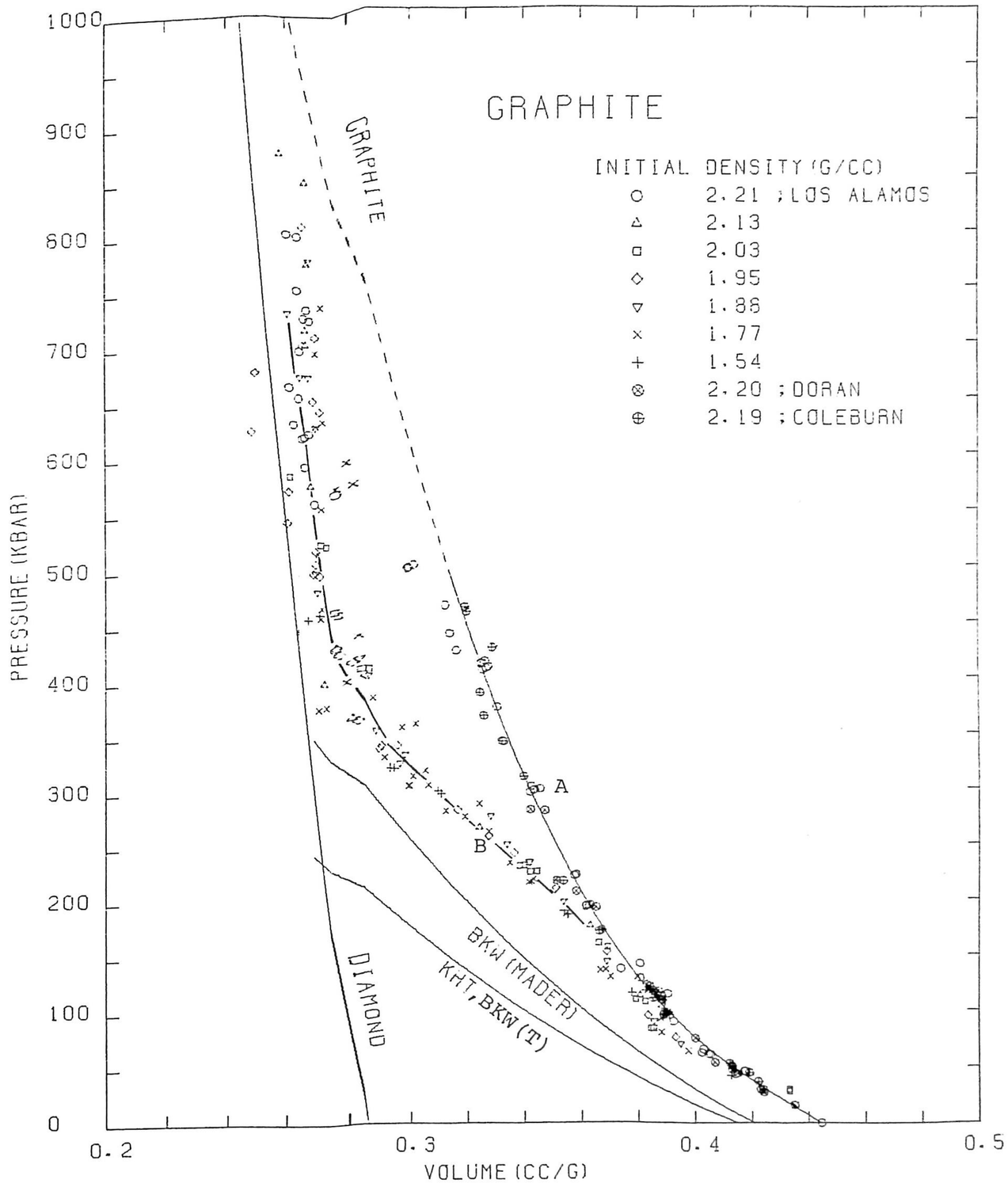


Fig. 12 Experimental Hugoniot data of solid carbon. Lines are 0°K isotherm. KHT and BKW(T) in the figure is used in this report. (see text and Table 3)

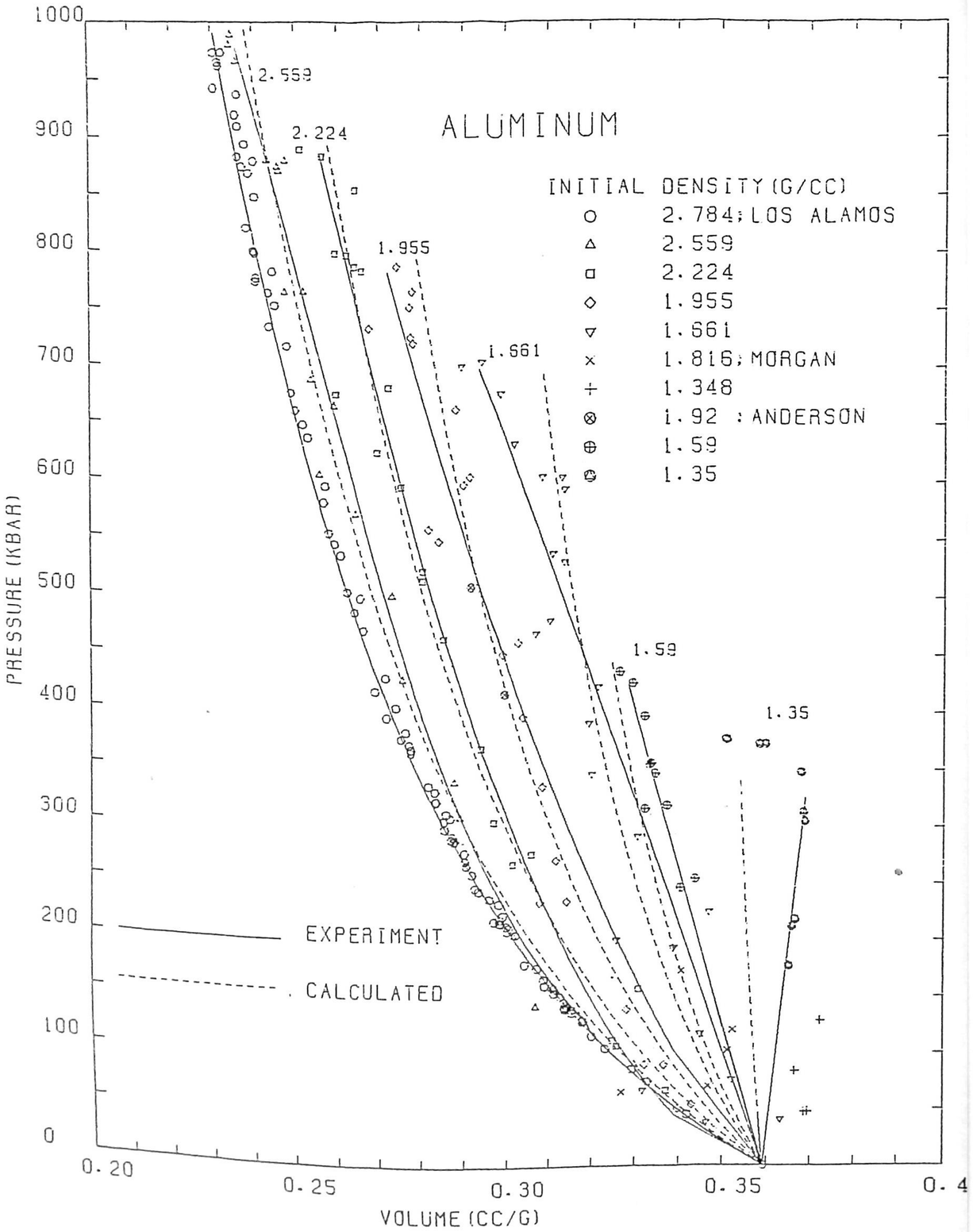


Fig. 13 Experimental Hugoniot data of aluminum. Solid lines are Hugoniot calculated by compaction model using Mie-Gruneisen equation.

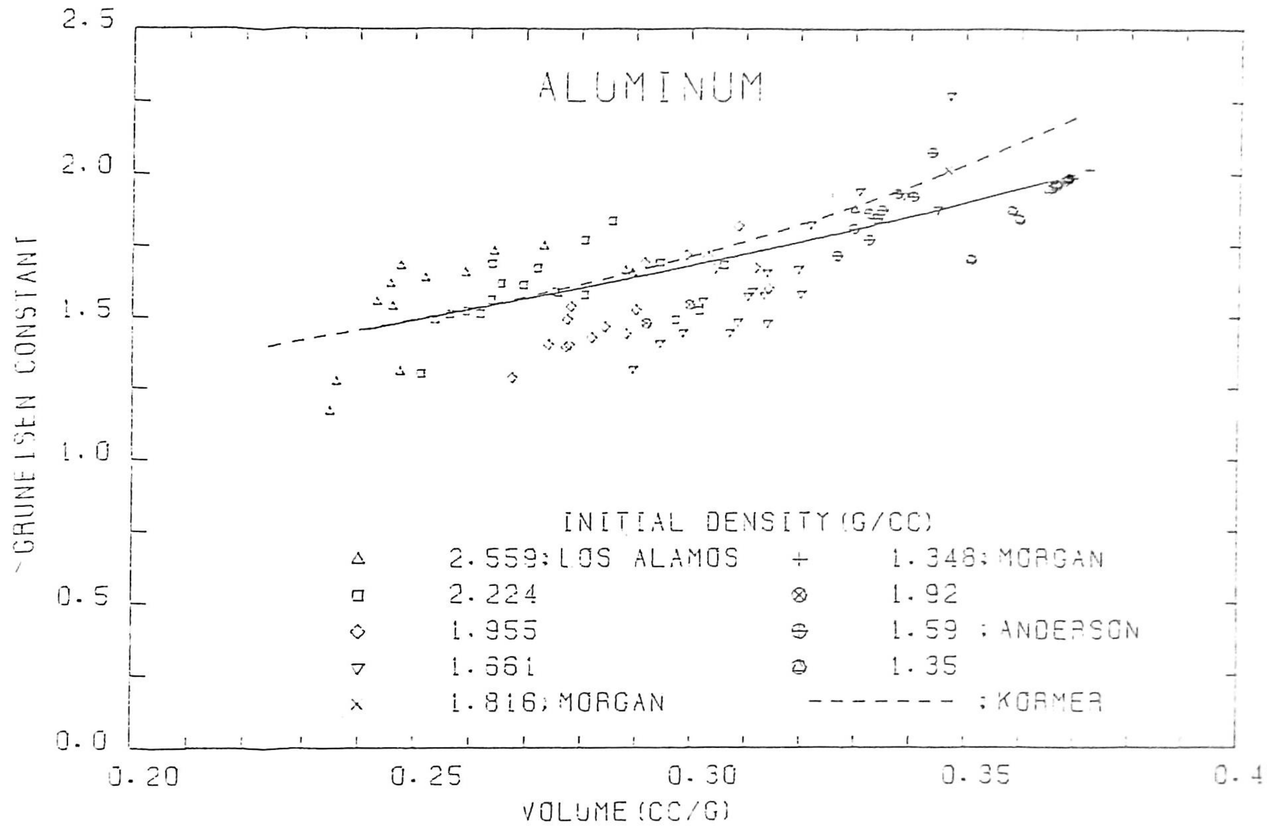


Fig. 14 Gruneisen constant of aluminum. Estimated from the Hugoniot data of porous aluminum.

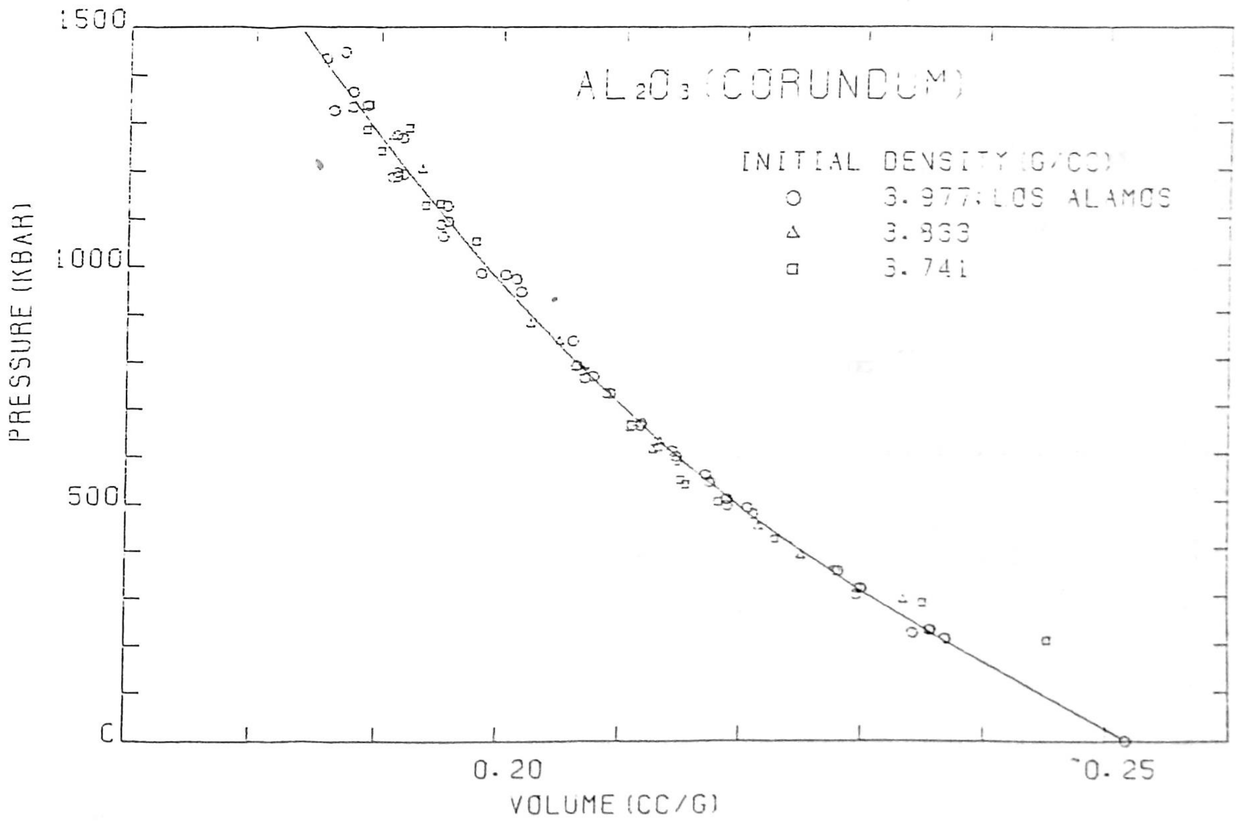


Fig. 15 Hugoniot curve of Al_2O_3 .

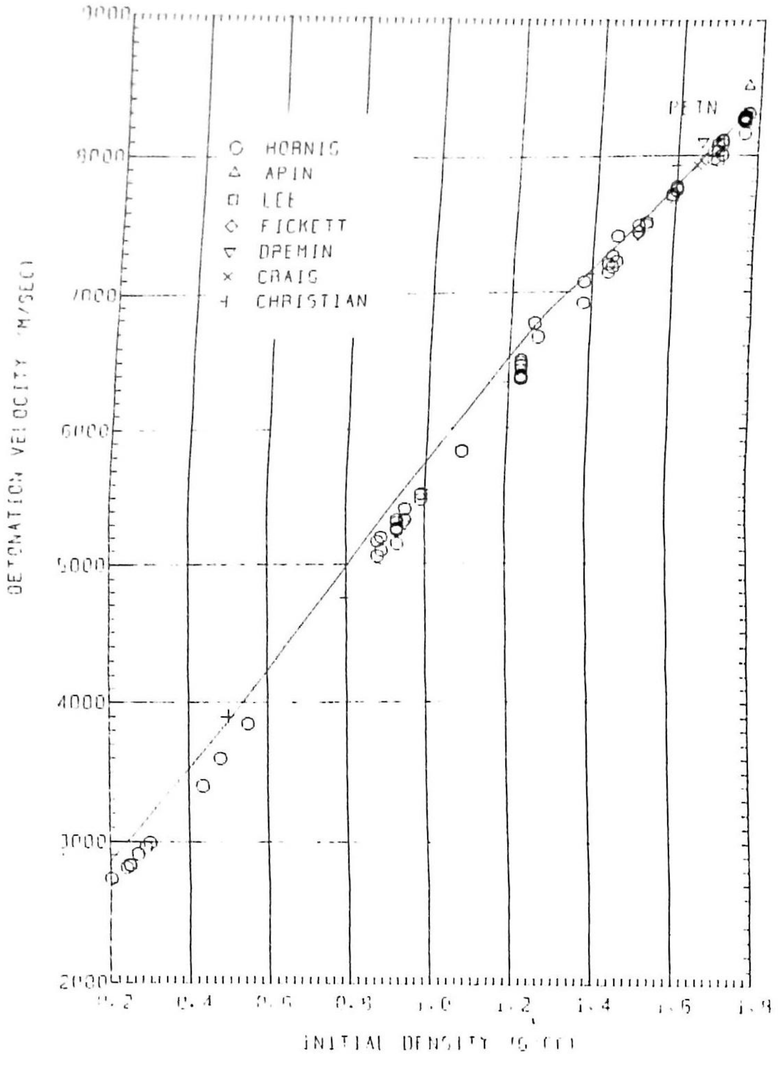


Fig. 16 Detonation velocity vs initial density for PETN.
A solid line is calculated by KHT.

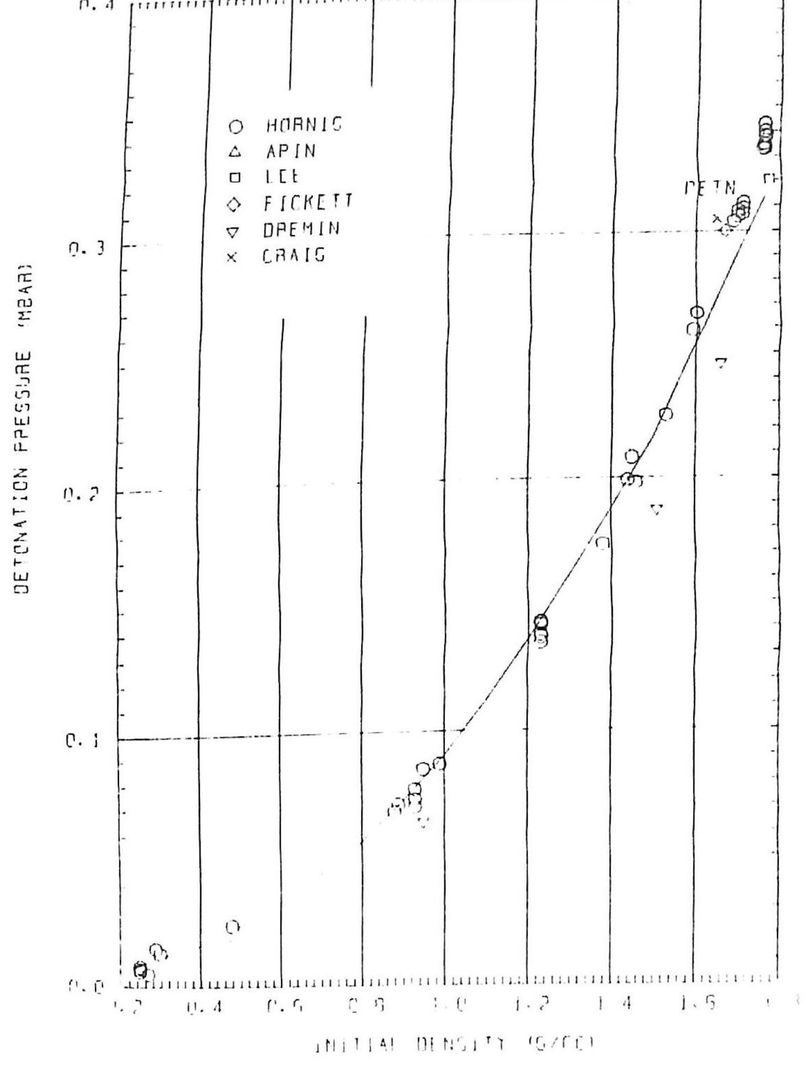


Fig. 17 Detonation pressure vs initial density for PETN.
A solid line is calculated by KHT.

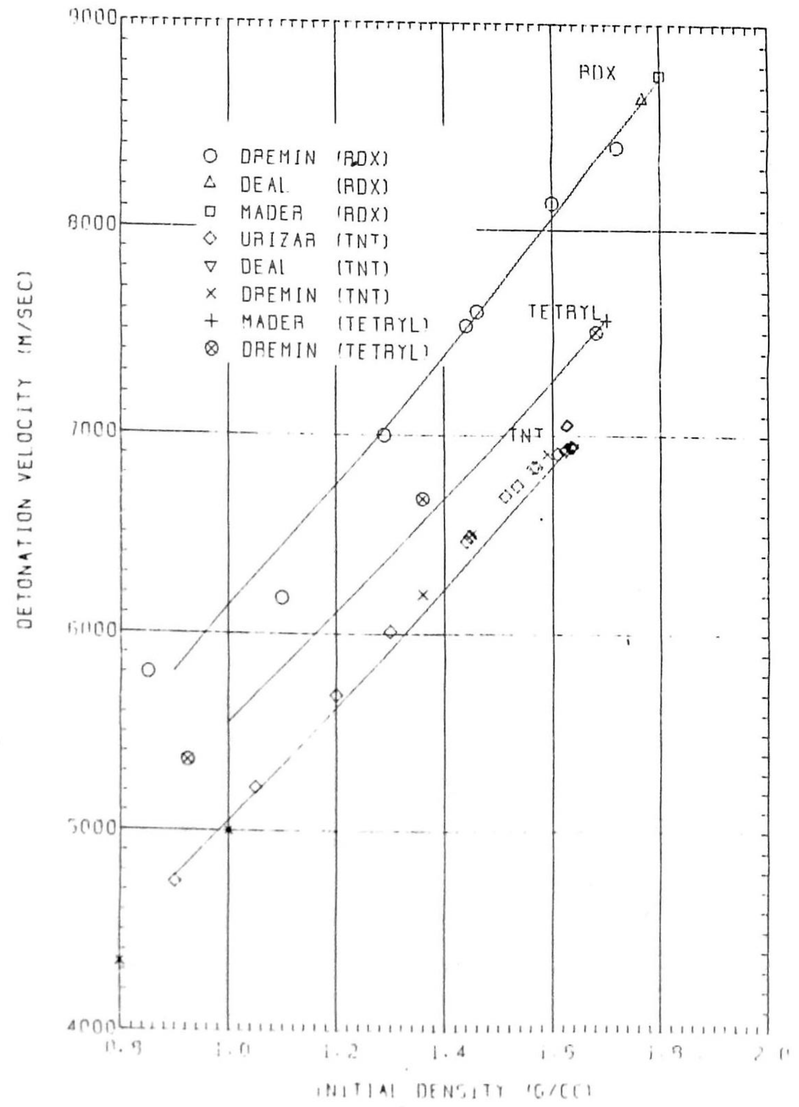


Fig.18 Detonation velcity vs initial density.
Solid lines are calculated by KHT.

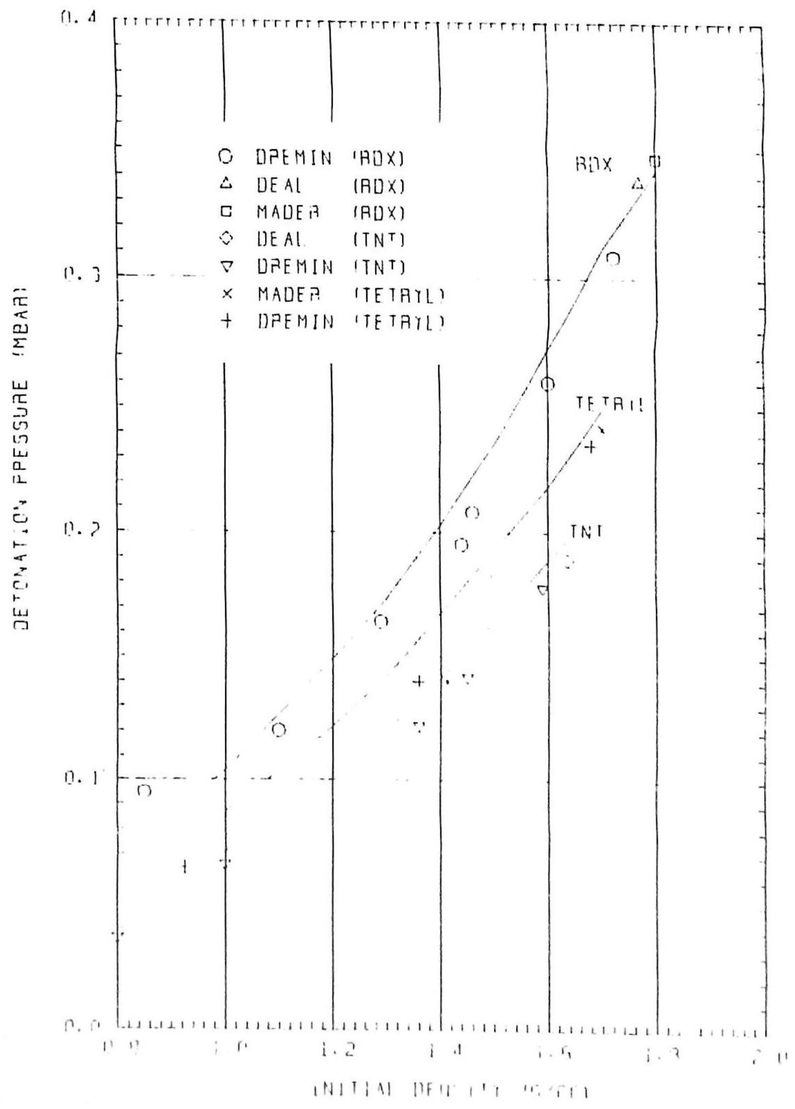


Fig.19 Detonation pressure vs initial density.
Solid lines are calculated

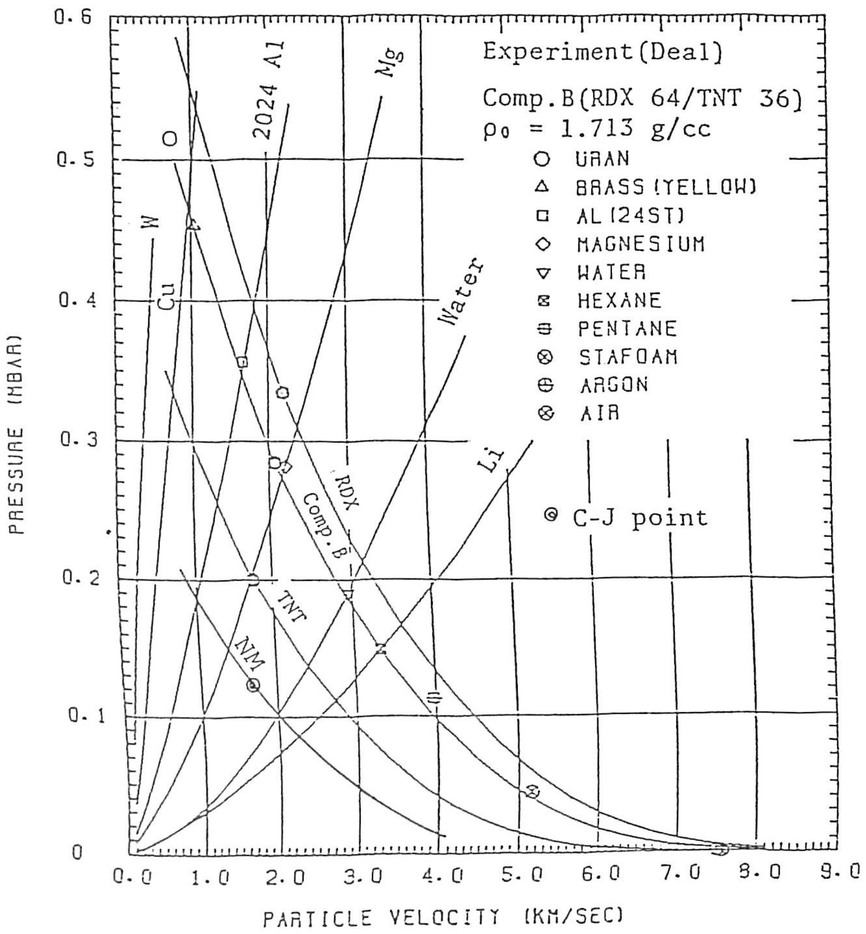


Fig. 20 Pressure-particle velcity isentrope through Chapman-Jouget point.

Table 1 The equation of state constants derived from measured Hugoniots.

	This Work	KH(1975)	KH(1952)
a	-1.8523	0.958	"
b	40.245	1.635	"
c	-235.06	-9.928	"
d	661.49	-	
e	-670.48	-	
α	1.85	1.878	"
n	9.	9	"
$\lambda^{1/3}$ ($cm^3(10^{12}erg)^{1/3}$)			
H_2O	6.1	6.877	6.665
H_2	2.9	3.209	3.154
O_2	9.2	7.794	8.153
CO_2	14.0	12.837	12.794
CO	9.8	9.169	9.283
N	9.8	9.169	9.283
NO_2	9.15	8.481	-
OH	5.65	5.499	-
H	1.25	1.605	-
NH_3	9.1	-	-
CH_4	11.0	-	11.604

Others

$\lambda^{1/3}$ ($cm^3(10^{12}erg)^{1/3}$)

N_2H_4	9.1	Cl_2	23.9	Ar	9
HCN	11	ClF	16	Xe	12
F_2	9	Cl	11.9	Kr	11
HF	3.8	$CHCl_3$	47.5		
CF_4	23	CCl_4	60		
B_2O_3	14.5	Al_2O	25		
HBO_2	30	AlF_3	20		
BF_3	30	CS_2	22		
HBr	18	SO_2	18		
Br_2	27.5	SO	14		
$CHBR_3$	53	H_2S	15		
CBr_4	70	$POCl_3$	46.4		
HCl	11	PCl_3	46.4		

Table 2

Explosives		RDX $C_3H_6N_6O_6$	TNT $C_7H_5N_3O_6$	PETN $C_5H_8N_4O_{12}$	Tetryl $C_7H_5N_5O_8$
ρ_o (g/cm^3)		1.8	1.64	1.763	1.7
$H_f°$ (Kcal/mole)		16.9	-14.19	-127.2	8.07
Detonation Velocity (m/sec)	Experiment	8754	6950	8270	7560
	Calculation				
	KHT(eq.(9))[1]	8743	6969	8300	7573
	KHT[2]	8890	7328	8358	7830
	BKW(RDX Param.)[3]	8754	7197	8421	7629
	BKW(TNT Param.)[4]	8263	6950	----	----
Detonation Pressure (kbar)	Experiment	347	190	335	242
	Calculation				
	KHT(eq.(9))[1]	342	202	306	251
	KHT[2]	346	206	312	254
	BKW(RDX Param.)[3]	347	213	318	251
	BKW(TNT Param.)[4]	324	206	----	----
Detonation Temperature (°k)	Calculation				
	KHT(eq.(9))[1]	3504	3414	3672	3795
	KHT[2]	3472	3356	3677	3745
	BKW(RDX Param.)[3]	2587	2829	2833	2917
	BKW(TNT Param.)[4]	2861	2937	----	----
Detonation Products (mole%) KHT(eq.(9))[1]	H_2O	33.2	22.48	36.18	20.59
	H_2	0.04	0.15	0.07	0.12
	O_2	0.00	0.00	0.01	0.00
	CO_2	16.33	14.94	35.37	21.52
	CO	0.62	2.15	1.88	2.85
	N_2	33.24	13.60	18.08	20.74
	NO	0.12	0.03	0.14	0.11
	H	0.00	0.00	0.00	0.00
	OH	0.03	0.02	0.06	0.05
	CH_4	0.00	0.00	0.00	0.00
	NH_3	0.04	0.06	0.04	0.06
	C(S)	16.37	46.56	8.17	33.95

1. eq. (9)
2. in Fig.3
3.4. Mader's calculation

Table 3 Calculated results of KHT and BKW .
BKW(M) ; by Mader and BKW(T) ; by Tanaka with Soft Solid Carb

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param
BCHNO					
1/3.75 moles Ethyl Decaborane/ Tetranitromethane	D	6740	6739	6945	6808
	P	172	172	196	191
ρ = 1.40	T	4460	5594	5336	5008
ΔH_f = 65	γ	2.70	2.69	2.43	2.39
1/4.45moles Ethyl Decaborane/ Tetranitromethane	D	6820	6721	6897	6913
	P	167	173	196	194
ρ = 1.427	T		5721	5409	4939
ΔH_f = 71.16	γ	2.97	2.72	2.46	2.51
CHNF					
1,2 Bis(diduoroamino)- propane	D	5960	5976	7213	
	P	140	121	209	
ρ = 1.256	T		4312	2905	
ΔH_f = 39.5	γ		2.70	2.12	
CHNO(Solid One Component)					
RDX, Cyclotrimethylene trinitramine	D	8754	8743	8754	8656
	P	347	336	347	346
ρ = 1.80	T		3488	2587	2701
ΔH_f = 16.90	γ	2.98	3.09	2.98	2.90
RDX	D	5981	6140	6128	5999
ρ = 1.0	P		106	108	106
	T		3972	3600	3732
	γ		2.56	2.48	2.39
TNT, Trinitrotoluene	D	6950	6969	7197	7005
ρ = 1.64	P	190	203	213	210
ΔH_f = -14.19	T		3420	2829	3002
	γ	3.16	2.92	2.98	2.84

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Para
TNT	D	5254	5225		5233
ρ = 1.061	P	110	80		83
	T		3319		3294
	γ	1.66	2.62		2.50
TNT	D	4200	4296		4395
ρ = 0.732	P	59	40		44
	T		3231		3231
	γ	1.18	2.36		2.23
HMX, Cyclotetramethylene-	D	9100	9075	9159	9030
tetranitramine	P	393	394	395	395
ρ = 1.90	T		3361	2364	2472
ΔH_f = 17.89	γ	3.0	2.98	3.03	2.92
PETN, Pentaerythritol	D	7980	7996	8056	7982
Tetranitrate	P	300	271	280	283
ρ = 1.67	T		3758	3018	3035
ΔH_f = -127.2	γ	2.55	2.94	2.86	2.77
PETN	D	8300	8289	8421	8355
ρ = 1.77	P	335	303	318	323
	T	3400	3668	2833	2183
	γ	2.64	2.99	2.94	2.83
PETN	D	5480	5757	5947	5882
ρ = 1.0	P	87	90	101	99
	T		4202	3970	3777
	γ	2.45	2.68	2.48	2.48
PETN	D	3600	3868	4313	4225
ρ = 0.50	P	24	24	30.3	29
	T		4438	4493	4308
	γ	1.70	2.13	2.06	2.03
PETN	D	2830	3019	3414	3340
ρ = 0.25	P	7	8.6	10.5	10.3
	T		4410	4442	4339
	γ	1.86	1.59	1.78	1.72
TATB, 1,3,5,-Triamino-	D	7860	8029	8411	8143
2,4,6-trinitrobenzene	P	315	302	326	325
ρ = 1.895	T		2656	1887	2103
ΔH_f = -33.4	γ	2.72	3.04	3.11	2.86

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Par
DATB, 1,3-Diamino-2,4,6-	D	7520	7612	7959	7709
trinitrobenzene	P	259	257	282	274
ρ = 1.788	T		3054	2477	2479
ΔH_f = -23.6	γ	2.90	3.01	3.02	2.88
Tetryl,N-Methyl-N,2,4,6-	D	7560	7571	7629	7515
tetranitroaniline	P		250	251	255
ρ = 1.70	T		3791	2917	3224
ΔH_f = 8.07	γ		2.90	2.93	2.76
NQ,Nitroguanidine	D	7980	7869	8069	7961
ρ = 1.629	P		238	256	253
ΔH_f = -20.29	T		2081	1581	1603
	γ		3.24	3.15	3.08
Sorguyl, 1,3,4,6-Tetra-	D	----	8913	(8791)	8948
nitroglycoluril	P		377	(369)	389
ρ = 2.01,(1.98)	T		3426	(2276)	2353
ΔH_f = 10.0	γ		(3.24)	3.15	3.14
PYX,2,6,-Bis(picrylamino)-	D	----	7405	7587	7398
3,5-dinitropyridine	P		245	256	252
ρ = 1.77	T		3599	2868	3037
ΔH_f = 20.90			2.97	2.97	2.85
PATO,3-Picryiamino-1,2,4-	D	----	7953	8338	7983
triazole	P		310	333	332
ρ = 1.94	T		3187	2190	2625
ΔH_f = 36.3	γ		2.95	3.05	2.72
TPT,2,4,6-Tripicryl-3-	D	----	7078	7143	6990
triazine	P		210	218	219
ρ = 1.67	T		3919	3185	3485
ΔH_f = 118.1	γ		2.99	2.92	2.74
T-TACOT,1,3,8,10-	D	----	7467	7618	7363
Tetranitrobenzotriazolo-					
(1,2-a)benzotriazole	P		252	262	259
ρ = 1.81	T		3653	4143	3150
ΔH_f = 112.4	γ		2.94	3.00	2.79
Z-TACOT,1,3,7,9-Tetra-	D	7250	7520	7757	7482
nitrobenzotriazolo-					
(2,1,-a)benzotriazole	P		272	278	276
ρ = 1.85	T		3651	2860	3105
ΔH_f = 110.50	γ		2.84	3.00	2.75

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Para
PADP,2,6-Bis(picrylazo) 3,5-dinitropyridine	D	----	7839	7971	7751
	P		289	300	299
ρ = 1.86	T		3954	3112	3315
ΔH_f = 147.70	γ		2.96	2.93	2.74
ABH,Azobis(2,2',4,4',6,6'-(hexanitrobiphenyl)	D	7600	7515	7627	7416
	P		267	265	260
ρ = 1.78	T		4146	3356	3518
ΔH_f = 116.30	γ		2.77	2.89	2.76
BisHNAB,Dodecanitro-3, 3-bis(phenylazo)biphenyl	D	----	7704	7799	7580
	P		276	283	277
ρ = 1.81	T		4190	3400	3568
ΔH_f = 191.10	γ		2.90	2.89	2.75
HNAB, Hexanitroazobenzene	D	----	7583	7697	7490
	P		265	269	264
ρ = 1.775	T		4032	3265	3419
ΔH_f = 67.90	γ		2.85	2.90	2.77
TPB, Tripicrylbenzene	D	----	6618	6896	6691
	P		182	197	191
ρ = 1.67	T		3281	2772	2897
ΔH_f = -62.10	γ		3.02	3.03	2.91
PENCO, Pentanitrobenzo-phenone	D	----	7364	7686	7433
	P		260	272	271
ρ = 1.86	T		3489	2717	2938
ΔH_f = -26.6	γ		2.87	3.03	2.79
DODECA,Dodecanitro-m,m'-quatraphenyl	D	----	7495	7650	7437
	P		258	270	265
ρ = 1.81	T		4000	3249	3415
ΔH_f = 50.60	γ		2.94	2.92	2.78
BTX,Dinitropicrylbenzo-triazole	D	----	7296	7451	7242
	P		238	245	238
ρ = 1.74	T		3766	3070	3227
ΔH_f = 70.90	γ		2.89	2.95	2.84
NONA, Nonanitroterphenyl	D	7560	7410	7568	7355
	P		257	260	254
ρ = 1.78	T		3998	3252	3392
ΔH_f = 27.4	γ		2.81	2.91	2.79

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Par
HNBP, Hexanitrobiphenyl	D	----	7323	7474	7267
	P		244	249	243
ρ = 1.74	T		3859	3252	3393
ΔH_f = 14.6	γ		2.83	2.90	2.79
TNN, Tetranitronaphthalene	D	----	7256	7528	7277
	P		244	255	250
ρ = 1.80	T		3637	2932	3134
ΔH_f = 12.30	γ		2.89	2.99	2.82
ONT, Octanitroterphenyl	D	7330	7335	7562	7329
	P		246	260	253
ρ = 1.80	T		3762	3060	3227
ΔH_f = 19.70	γ		2.94	2.96	2.82
DIPAM, Dipicramide	D	7500	7532	7738	7544
	P		253	269	266
ρ = 1.79	T		3508	2781	2931
ΔH_f = -6.80	γ		3.02	2.98	2.83
HNS, Hexanitrostilbene	D	7130	7181	7410	7179
	P		231	241	235
ρ = 1.74	T		3707	3059	3214
ΔH_f = 13.77	γ		2.88	2.96	2.82
ATNI, Ammonium Trinitro-imidazole	D	----	8557	8560	8536
	P		324	330	336
ρ = 1.835	T		3342	2266	2495
ΔH_f = -3.43	γ		3.15	3.06	2.98
Explosive D, Ammonium Picrate	D	6850	6769	6986	6883
	P		180	189	188
ρ = 1.55	T		2933	2374	2484
ΔH_f = -92.98	γ		2.95	3.00	2.91
EDNA(Haleite) Ethylene Dinitramine	D	----	8407	8534	8421
	P		290	310	316
ρ = 1.71	T		2891	2162	2292
ΔH_f = -24.71	γ		3.18	3.02	2.83
DNPA, Dinitropropyl Acrylate	D	----	6272	6880	6445
	P		141	161	153
ρ = 1.47	T		2327	2197	1968
ΔH_f = -103.22	γ		3.11	3.06	3.00

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Para
CHNO (Solid Mixture)					
Octol 76.3/23.7 HMX/TNT	D	8476	8449	8555	8407
ρ = 1.809	P	343	321	333	340
ΔH_f = 3.13/100 g	T		3443	2578	2737
	γ	2.79	3.02	2.98	2.76
Cyclotol, 77/23 RDX/TNT	D	8250	8251	8311	8186
ρ = 1.743	P	313	297	305	311
ΔH_f = 4.17/100 g	T		3538	2711	2870
	γ	2.79	3.00	2.95	2.75
Composition B, 64/36 RDX/TNT	D	8030	7991	8084	7936
	P	294	277	284	283
ρ = 1.713	T		3551	2763	2922
ΔH_f = 2.62/100 g	γ	2.76	2.95	2.94	2.81
PBX-9011,	D	8500	8457	8496	8394
90/10 HMX/Estane	P	298	319	319	326
ρ = 1.767	T		3419	2393	2740
ΔH_f = 5.83/100 g	γ	3.28	2.96	2.99	2.82
PBX-9205,92/6/2	D	---	8100	8125	8034
RDX/Polystylene/DOP	P		280	281	285
ρ = 1.69	T		3417	2497	2813
ΔH_f = 7.00/100 g	γ		2.97	2.97	2.83
PBX-9501, 95/2.5/2.5	D	8826	8821	8886	8764
HMX/Estane/BFNPF	P		358	363	373
ρ = 1.841	T		3412	2455	2628
ΔH_f = 5.84/100 g	γ		3.01	3.00	2.79
EDC-11, 64/4/30/1/1	D	8213	8254	8384	8220
HMX/RDX/TNT/Wax/Trylene	P	315	308	315	317
ρ = 1.782	T		3437	2571	2763
ΔH_f = 9.43/100 g	γ	2.82	2.94	2.97	2.80
EDC-24, 95/5 HMX/Wax	D	8713	8515	8636	8469
ρ = 1.776	P	342	324	334	332
ΔH_f = 3.24/100 g	T		3285	2476	2601
	γ	2.94	2.97	2.97	2.84
LX-14,95/5 HMX/Estane	D	8760	8678	8749	8617
	P		336	348	352
ρ = 1.81	T		3397	2510	2667
ΔH_f = 5.94/100 g	γ		3.06	2.98	2.82

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param.
Pentolite, 50/50 PETN/TNT	D	7465	7464	7740	7473
ρ = 1.65	P		235	257	242
ΔH_f = -23.24/100 g	T		3606	3239	3050
	γ		2.91	2.84	2.81
HBX-0,48.9/46.1/5	D	----	7443	7609	7434
RDX/TNT/Wax	P		233	237	236
ρ = 1.62	T		3374	2741	2883
ΔH_f = -1.65/100 g	γ		2.85	2.95	2.79
75/25 HMX/Hydrazine	D	9100	9129	9240	9153
Nitrate	P		373	388	387
ρ = 1.86(?)	T		2975	2095	2136
ΔH_f = -10.99/100 g	γ		3.16	3.092	3.03
61/21/18 Nitroguanidine	D	----	7568	7703	7613
/HMX/Estane	P		222	229	234
ρ = 1.57	T		2609	2001	2170
ΔH_f = -9.91/100 g	γ		3.06	3.05	2.90
95/5 PYX/Polyethylene	D	7097	6721	6897	6716
ρ = 1.556	P		176	188	185
ΔH_f = 3.20/100 g	T		3469	2987	3107
	γ		2.98	2.93	2.79
95/5 Nitroguanidine/	D	8300	8135	8427	8293
Estane	P	268	271	288	285
ρ = 1.705	T		2042	1467	1530
ΔH_f = -18.32/100 g	γ	3.38	3.17	3.20	3.11
ANFO, 6/94 Oil/	D	5500	5213	5440	5425
Ammonium Nitrate	P		64.1	73.4	72.6
ρ = 0.88	T		2520	2252	2235
ΔH_f = -104.89/100 g	γ		2.73	2.55	2.57
CHNO(Liquids)					
Nitroglycerine	D	7580	7650	7700	7676
ρ = 1.59	P		235	246	245
ΔH_f = -89.02	T	3470	3871	3216	3137
	γ		2.96	2.83	2.83
Liquid TNT	D	6580	6439	6556	6420
ρ = 1.447	P	172	158	160	158
ΔH_f = -2.64	T	3030	3583	3055	3261
	γ	2.64	2.82	2.87	2.77

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Para
Nitromethane	D	6290	6264	6463	6272
ρ = 1.128	P	141	122	130	122
ΔH_f = -27.03	T	3380	3300	3120	3005
	γ	2.17	2.62	2.62	2.65
1/1.25 moles Acrylo-	D	6710	7077	7074	6999
Nitrile/Tetranitromethane	P	156	180	192	187
ρ = 1.38	T	4000	4744	4760	4533
ΔH_f = 53.66	γ	2.98	2.61	2.59	2.61
1/1.29 moles Benzene/	D	6850	6933	6960	6743
Tetranitromethane	P		178	181	179
ρ = 1.362	T	3520	4375	3855	3996
ΔH_f = 23.07	γ		2.68	2.65	2.47
6.435/2.2275/6.434 moles	D	6540	6439	6666	6615
$HNO_3/H_2O/CH_3NO_2$	P	145	136	153	151
ρ = 1.29	T	3400	2843	2477	2367
ΔH_f = -593.78	γ	2.80	2.91	2.76	2.75
1/0.071 moles Nitromethane	D	6570	6671	6798	6607
Tetranitromethane	P	138	148	153	146
ρ = 1.197	T	3480	3666	3354	3288
ΔH_f = -26.4	γ	2.74	2.60	2.61	2.59
1/0.25 moles Nitromethnae	D	6880	7013	7094	7007
Tetranitromethane	P	156	164	181	177
ρ = 1.310	T	3750	4243	3998	3758
ΔH_f = -24.83	γ	2.98	2.92	2.63	2.63
1/0.50 moles Nitromethane	D	6780	6861	6908	6868
/Tetranitromethane	P	168	170	179	179
ρ = 1.397	T	3580	3684	3248	3130
ΔH_f = -22.63	γ	2.82	2.86	2.73	2.69
14.5/85.5 Toluene/	D	5840	5655	5945	5719
Nitromethane	P	100	94.1	106	98.3
ρ = 1.088	T		2943	2907	2792
ΔH_f = -37.41	γ	2.71	2.68	2.63	2.62

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param.
CHNO Al					
Alex 20,44/32.2/19.8/4	D	7530	7024	7496	6893
RDX/TNT/Al/Wax	P	230	224	252	216
ρ = 1.801	T		5206	5166	4934
ΔH_f = -0.66/100 g	γ	3.44	2.97	3.01	2.97
Alex 32,37.4/27.8/30.8/4	D	7300	6347	7066	6559
RDX/TNT/Al/Wax	P	215	171	213	197
ρ = 1.88	T		5923	5928	5734
ΔH_f = -0.87/100 g	γ	3.66	3.42	3.41	3.11
HBX-1,40/38/17/5 RDX/TNT	D	7224	6869	7270	6706
/Al/Wax	P		206	229	198
ρ = 1.72	T		4879	4839	4648
ΔH_f = -1.83/100 g	γ		2.94	2.98	2.91
HBX-3, 31/29/35/5	D	6917	5833	6853	6687
RDX/TNT/Al/Wax	P		133	195	185
ρ = 1.81	T		5442	5690	5982
ΔH_f = -1.95/100 g	γ		3.64	3.37	3.37
Tritonal,80/20 TNT/Al	D	6475	6071	6583	5897
ρ = 1.72	P		165	191	158
ΔH_f = -5.0/100 g	T		5292	5330	5155
	γ		2.85	2.90	2.79
H-6,45/30/20/5 RDX/TNT/Al	D	7194	6744	7235	6661
/Wax	P		199	225	193
ρ = 1.71	T		5145	5138	4892
ΔH_f = -0.95/100 g	γ		2.92	2.96	2.92
Torpex, 42/40/18 RDX/TNT	D	7495	7151	7492	6884
/Al	P		238	259	221
ρ = 1.81	T		5369	5261	5082
ΔH_f = 0.70/100 g	γ		2.90	2.92	2.87
PBXC-117,71/17/12 RDX/AL	D	7700	7376	7680	7324
/Binder	P		234	249	235
ρ = 1.75	T		4618	4237	4268
ΔH_f = -7.26/100 g	γ		3.08	3.14	3.00
PBXN-1,68/20/12 RDX/Al	D	7930	7447	7693	
/Binder	P	245	247	254	
ρ = 1.77	T		4982	4721	
ΔH_f = -12.60/327 g	γ	3.54	3.06	3.12	

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Para
Destex,74.766/18.691 /4.672/1.869 TNT/Al/Wax /Graphite	D	6650	5938	6439	5862
	P	175	152	174	147
ρ = 1.68	T		4771	4866	4634
ΔH_f = -7/100 g	γ	3.24	2.90	3.00	2.94
CHNO Cl					
60/40 Nitromethane/Urea Perchlorate-Water(UP)	D	6700	6822	6897	6801
UP = 90/10 $CO(NH_3)_2HClO_4$ /H_2O	P		157	173	170
ρ = 1.30	T		3209	2760	2638
ΔH_f = -53.16	γ		2.85	2.58	2.54
40/60 Nitromethane/UP	D	6800	7109	7042	7018
	P		177	186	184
ρ = 1.39	T		3128	2515	2419
ΔH_f = -54.76	γ		2.97	2.71	2.73
20/80 Nitromethane/UP	D	7220	7386	7207	7240
	P		204	200	202
ρ = 1.48	T		3647	2253	2193
ΔH_f = -56.37	γ		2.95	2.85	2.84
50/50 Nitromethane/ Carbon Tetrachloride	D	5200	5499	5082	5027
	P	92	99	106	105
ρ = 1.35	T		2644	2078	1893
ΔH_f = -41.64	γ	2.97	3.12	2.28	2.28
CHNO ClP					
PBX-9404,94/3/3 HMX/ Nitrocellulose/CEF	D	8800	8777	8879	8758
	P	365	351	363	363
ρ = 1.844	T		3396	2466	2575
ΔH_f = 3.75/100 g	γ	2.91	3.05	3.01	2.90
PBX-9404	D	5905	5948	5976	5842
ρ = 0.969	P	92	98	99	98
	T		3897	3564	3673
	γ	2.67	2.52	2.46	2.38
PBX-9408,94/3.6/2.4 HMX /DNPA/CEF	D	8787	8766	8865	8743
	P		355	361	361
ρ = 1.842	T		3382	2427	2553
ΔH_f = 4.26/100 g	γ		2.99	3.01	2.90

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param.
CHNOF					
TFNA,Trifluoro-Trinitro- azahexane	D	7400	7331	7569	7530
	P	249	230	242	250
ρ = 1.692	T		3356	2204	2473
ΔH_f = -158	γ	2.72	2.96	3.01	2.83
TFENA, Trifluoroethyl- nitramine	D	6650	6261	6491	6529
	P	174	151	162	167
ρ = 1.523	T		3022	1827	2022
ΔH_f = -152	γ	2.87	2.97	2.95	2.88
TFTF, Trifluoro-trinitro- benzene	D	7000	7011	7049	6993
	P		220	224	228
ρ = 1.80	T		3816	2906	3179
ΔH_f = -114	γ		3.02	2.98	2.86
TFET,Trinitrophenyl- Trifluoroethylnitramine	D	7400	7397	7500	7424
	P		252	252	257
ρ = 1.786	T		3798	2611	2906
ΔH_f = -112	γ		2.88	2.98	2.83
PF, Fluorotrinitrobenzene nitramine	D	7500	7493	7612	7490
	P		266	268	271
ρ = 1.83	T		3915	2829	3142
ΔH_f = -36	γ		2.86	2.95	2.80
DFTNB, Difluoro-trinitro- benzene	D	7800	7389	7450	7361
	P		257	257	261
ρ = 1.851	T		3892	2801	3096
ΔH_f = -75	γ		2.93	3.00	2.84
LX-04, 85/15 HMX/Viton	D	8530	8616	8698	8633
	P		347	348	363
ρ = 1.865	T		3668	2218	2715
ΔH_f = -2.38/100 g	γ		2.99	3.06	2.83
LX-07, 90/10 HMX/Viton	D	8640	8729	8805	8722
	P		365	358	368
ρ = 1.865	T		3610	2292	2657
ΔH_f = 0.09/100 g	γ		2.89	3.04	2.86

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Par
LX-9, 93.3/4.4/2.3	D	8840	8779	8823	8738
HMX/DNPA/FEFO	P		348	356	360
ρ = 1.838	T		3360	2389	2551
ΔH_f = 2.60/100 g	γ		3.07	3.01	2.90
LX-10, 95/5 HMX/Viton	D	8820	8819	8890	8791
	P		365	364	371
ρ = 1.86	T		3503	2374	2609
ΔH_f = 3.07/100 g	γ		2.96	3.03	2.88
X0204, 83/17 HMX/Teflon	D	8440	8431	8791	8627
	P		328	362	370
ρ = 1.909	T		3191	2255	2194
ΔH_f = -28.98/100 g			3.14	3.07	2.84
65/35 RDX/TFNA	D	8220	8211	8278	8238
	P	324	297	302	308
ρ = 1.754	T		3486	2446	2648
ΔH_f = -15.08/100 g	γ	2.66	2.98	2.98	2.87
95/5 Nitroguanidine/	D	----	8013	8309	8240
Viton	P		259	280	280
ρ = 1.69	T		2172	1454	1589
ΔH_f = -21.19/100 g	γ		3.18	3.15	3.10

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param.
CHNOF Cl					
PBX-9010,90/10 RDX/Kel-F	D	8363	8403	8371	8334
	P	319	313	313	321
ρ = 1.781	T		3562	2490	2686
ΔH_f = -1.46/100 g	γ	2.91	3.02	2.98	2.85
90.54/9.46 HMX/Exon	D	8665	8607	8625	8567
	P	343	339	340	344
ρ = 1.833	T		3521	2383	2605
ΔH_f = 2.59/100 g	γ	3.01	3.01	3.01	2.86
PBX-9407, 94/6 RDX/Exon	D	7910	7958	7886	7838
	P		266	262	266
ρ = 1.61	T		3758	2853	3038
ΔH_f = 5.33/100 g	γ		2.92	2.81	2.71
PBXC-9,75/20/5 HMX/Al/	D	8503	7968	8463	
Viton	P		319	354	
ρ = 1.975	T		5664	5373	
ΔH_f = -4.36/100 g	γ		2.93	2.99	
X0219,90/10 TATB/Kel-F	D	7630	7909	----	8064
	P		297		323
ρ = 1.914	T		2760		2064
ΔH_f = -19.95/100 g	γ		3.03		2.85
PBX-9502, 95/5 TATB/Kel-F	D	7710	7943	----	8076
	P		289		321
ρ = 1.894	T		2711		2092
ΔH_f = -16.45/100 g	γ		3.14		2.85
45/45/10, TATB/HMX/Kel-F	D	8167	8309	8553	8376
	P		321	339	348
ρ = 1.898	T		3082	2018	2279
ΔH_f = -11.41/100 g	γ		3.08	3.10	2.83
90.1/9.9 RDX/Exon	D	8404	8458	8403	8336
	P	320	320	317	324
ρ = 1.786	T		3611	2468	2723
ΔH_f = 3.84/100 g	γ	2.95	2.99	2.98	2.83

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Par
CHNOS					
Dinitropropyl Sulfite	D		6781	6650	6631
	P	185	181	174	179
ρ = 1.53	T		3227	2587	2834
ΔH_f = -136	γ		2.88	2.88	2.77
CHNO Si					
76/24 PETN/Silicon Rubber	D	7100	6909	7037	6776
	P		180	173	181
ρ = 1.49	T		3671	2814	3145
ΔH_f = -30.58/ 100 g	γ		2.95	3.26	2.77
CN					
2,4,6 Triazido-s-Triazine (Cyanuric Triazide)	D	5600	5857	5788	5747
	P		100	105	103
ρ = 1.15	T		3872	3581	3465
ΔH_f = 218.59	γ		2.96	2.66	2.67
CNO					
TNM, Tetranitromethane	D	6360	6226	6421	6361
	P	159	153	162	157
ρ = 1.64	T	2800	1645	1341	1228
ΔH_f = 8.80	γ	3.17	3.15	3.16	3.22
TNTAB, Triazidotrinitro-benzene	D	8576	8282	8094	7876
	P		314	300	292
ρ = 1.74	T		4901	4046	4123
ΔH_f = 270	γ		2.80	2.80	2.70
HNB, Hexanitrobenzene	D	9300	8626	8466	8512
	P		352	355	363
ρ = 1.973	T		4544	3269	3507
ΔH_f = 10	γ		3.17	2.98	2.94
BTF, Benzotrisoxadiazole-oxide	D	8485	8194	8156	7886
	P		328	325	315
ρ = 1.859	T		4917	4059	4315
ΔH_f = 144	γ		2.81	2.81	2.67
BTF	D	8262	7942	7890	7608
	P		288	291	280
ρ = 1.76	T		4952	4214	4315
	γ		2.86	2.76	2.64

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Param.
1/1 moles BTF/TNM	D	----	7982	7791	7731
	P		266	273	268
ρ = 1.673	T		5326	4750	4540
ΔH_f = 152.8	γ		3.00	2.72	2.74
3/1 moles Cyanogen/ Tetranitromethane	D	----	6530	6316	6429
	P		127	135	140
ρ = 1.1276	T		7321	5793	6682
ΔH_f = 230.5	γ		2.79	2.33	2.34
HN					
Hydrazine Azide	D	6000	6394	7390	7251
	P		162	135	130
ρ = 1.0	T		1723	1400	1282
ΔH_f = 40	γ		3.02	3.05	3.03
HNO					
Hydrazine Nitrate	D	8691	8201	8474	8422
	P		244	276	273
ρ = 1.626	T		1713	1347	1258
ΔH_f = -59.03	γ		3.49	3.22	3.22
21/79 Hydrazine/ Hydrazine Nitrate	D	8600	8526	8682	8819
	P		251	265	274
ρ = 1.4418	T	2900	2598	1500	1923
ΔH_f = -15/100 g	γ		3.12	3.10	3.04
70/30 Hydrazine/ Hydrazine Nitrate	D	8025	7727	9393	9336
	P		158	227	225
ρ = 1.14	T	2180	1610	1008	1001
ΔH_f = 12/ 100 g	γ		3.29	3.42	3.39
Ammonium Nitrate	D	4500	4883	5262	5141
	P		61	73.2	68
ρ = 1.05	T		1127	1112	1265
ΔH_f = -87.28	γ		3.08	2.97	3.06

Table 3 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(M) RDX Param.	BKW(T) RDX Pa
NO Al					
90/10 Ammonium Nitrate /Aluminum ρ = 1.05 ΔH_f = −98.14/100 g	D	5600	5274	5453	
	P		76	85.3	
	T		3011	2775	
	γ		2.85	2.65	
80/20 Ammonium Nitrate /Aluminum ρ = 1.05 ΔH_f = −87.23/100 g	D	5800	5008	5370	
	P		71	85.6	
	T		4552	4754	
	γ		2.72	2.54	
70/30 Ammonium Nitrate /Aluminum ρ = 1.05 ΔH_f = −76.33/100 g	D	5400	4556	5093	
	P		60	78.8	
	T		5368	5586	
	γ		2.64	2.46	
NO					
Nitric Oxide ρ = 1.30 ΔH_f = −17	D	5620	5639	5607	5576
	P	103	104	106	105
	T		2156	1854	1791
	γ	2.99	2.99	2.84	2.87
N Pb					
Lead Azide ρ = 4.0 ΔH_f = 113.98	D	5600	5098	4994	4918
	P	133	224	231	221
	T		3475	2658	2890
	γ	8.43	3.64	3.30	3.37

Table 4 Calcualted Results for C-N-O Explosives

$\lambda(CO_2)$= 15.5 (> 14 in the case of Table 3)

Explosive	C-J Param.	Expt'l	KHT
CNO			
TNM, Tetranitromethane ρ=1.64 E_0=8.8	D	6360	6342
	P	159	151
	T	2800	1565
	γ	3.17	3.36
TNTAB, 1,2,5,-Triazido-2,4,6-trinitrobenzene ρ=1.74 E_0=270.0	D	8576	8506
	P		327
	T		4680
	γ		2.86
HNB, Hexanitrobenzene ρ=1.973 E_0=10	D	9300	9129
	P		390
	T		4216
	γ		3.21
BTF, Benzotris(1,2,5,-oxadiazole-1-oxide) ρ=1.859 E_0=144	D	8485	8504
	P		356
	T		4709
	γ		2.78
BTF ρ =1.76	D	8262	8241
	P		322
	T		4803
	γ		2.72
1/1 moles BTF/TNM ρ=1.673 E_0=152.8	D	---	8314
	P		291
	T		4945
	γ		2.98
3/1 moles Cyanogen/Tetranitro-methane ρ=1.1276 E_0=230.5	D	---	6746
	P		137
	T		7094
	γ		2.75

Table 5 Calculated results of non-ideal explosives

Explosive	C-J Param.	Expt'l	KHT	BKW(T) RDX Param.
CHNO Al (non-reactive aluminum)				
Alex 20,44/32.2/19.8/4	D	7530	7536	7600
RDX/TNT/Al/Wax	P	230	230	242
ρ = 1.801	T		2871	2483
ΔH_f = -0.66/100 g	γ	3.44	3.44	3.30
Alex 32,37.4/27.8/30.8/4	D	7300	7423	7530
RDX/TNT/Al/Wax	P	215	219	234
ρ = 1.88	T		2599	2289
ΔH_f = -0.87/100 g	γ	3.66	3.73	3.55
HBX-1,40/38/17/5 RDX/TNT	D	7224	7239	7301
/Al/Wax	P		207	218
ρ = 1.72	T		2917	2561
ΔH_f = -1.83/100 g	γ		3.36	3.20
HBX-3, 31/29/35/5	D	6917	6854	6985
RDX/TNT/Al/Wax	P		172	186
ρ = 1.81	T		2466	2233
ΔH_f = -1.95/100 g	γ		3.36	3.76
Tritonal,80/20 TNT/Al	D	6475	6629	6747
ρ = 1.72	P		168	183
ΔH_f = -5.0/100 g	T		2919	2640
	γ		3.50	3.29
H-6,45/30/20/5 RDX/TNT/Al	D	7194	7176	7240
/Wax	P		197	216
ρ = 1.71	T		2866	2233
ΔH_f = -0.95/100 g	γ		3.46	3.76
Torpex, 42/40/18 RDX/TNT	D	7495	7628	7679
/Al	P		242	264
ρ = 1.81	T		3067	2643
ΔH_f = 0.70/100 g	γ		3.36	3.04
PBXC-117,71/17/12 RDX/AL	D	7700	7632	7691
/Binder	P		235	246
ρ = 1.75	T		2711	2306
ΔH_f = -7.26/100 g	γ		3.33	3.21
PBXN-1,68/20/12 RDX/Al	D	7930	7817	7872
/Binder	P	245	247	262
ρ = 1.77	T		2678	2271
ΔH_f = -12.60/327 g	γ	3.54	3.48	3.28

Table 5 (continued)

Explosive	C-J Param.	Expt'l	KHT	BKW(T) RDX Param.
Destex,74.766/18.691	D	6650	6388	6528
/4.672/1.869 TNT/Al/Wax				
/Graphite	P	175	155	165
ρ = 1.68	T		2734	2494
ΔH_f = -7/100 g	γ	3.24	3.44	3.33
CHNO Pb (non-reactive lead)				
80/10/10 RDX/Exon/Pb	D	6734	6681	
(vol.%)	P		290	
ρ = 2.700	T		3505	
ΔH_f = 5.78/100 g	γ		3.159	
70/10/20 RDX/Exon/Pb	D	5709	5676	
(vol.%)	P		269	
ρ = 3.650	T		3345	
ΔH_f = 4.41/100 g	γ		3.371	
60/10/30 RDX/Exon/Pb	D	5012	4966	
(vol.%)	P	150	243	
ρ = 4.60	T		3142	
ΔH_f = -3.04/100 g	γ	6.70	3.672	
CHNOW (non-reactive tungsten)				
55/10/35 HMX/Exon/W	D	4900	4586	
(vol.%)	P	230	290	
ρ = 7.90	T		2502	
ΔH_f = 1.13/100 g	γ	7.24	4.732	
CHNO				
Amatex 40 41/30/21	D	7545	7906	
EDX/TNT/AN	P		256	
ρ = 1.66	T		3157	
ΔH_f = -21.65/92 g	γ		3.051	
Amatex 20 20/38/42	D	7009	7696	
	P		235	
ρ = 1.61	T		2849	
ΔH_f = -46.65/100 g	γ		3.061	
Amatol 40/60 TNT/AN	D	5760	7650	
	P		224	
ρ = 1.60	T		2519	
ΔH_f = -67.92/100 g	γ		3.181	

ble 5 (continued)

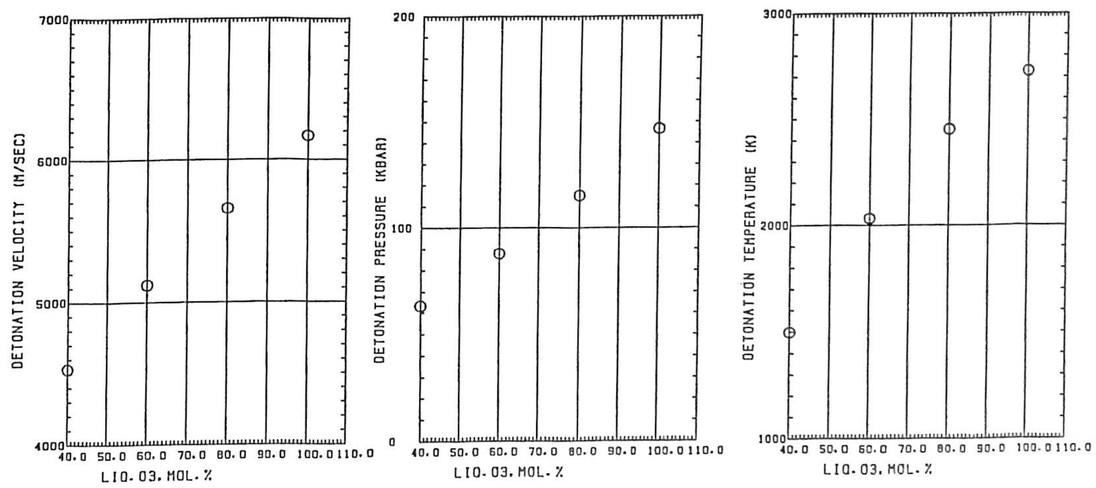
ve		
		BKW(T)
Expt'l	KHT	RDX Param.
5800	5853	
	95	
2160		
2.964		

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES	LIQ.03	#LIQ. 03/02 0.8/0.2 MOLE	#LIQ. 03/02 0.6/0.4 MOLE	#LIQ. 03/02 0.4/0.6 MOLE	#
RHO (G/CC)	1.554	1.441	1.344	1.258	
EO (KCAL/MOLE)	34.14	27.24	19.92	12.81	
MOL.WEIGHT (G)	47.998	44.798	41.598	38.399	
O	3.0000	2.8000	2.6000	2.4000	
DETN.VEL (M/SEC)	6167.1	5657.2	5120.0	4531.6	
PARTICL.VEL(")	1530.9	1411.6	1277.7	1111.8	
C-J PRESS (KBAR)	146.7	115.1	87.9	63.4	
C-J VOLUME (CC/G)	0.48377	0.52081	0.55838	0.59989	
C-J TEMP (DEG K)	2726.0	2452.8	2032.1	1498.3	
C-J S(CAL/DEG MOL)	46.63	46.07	44.87	42.85	
C-J ENERGY (CAL/G)	280.07	238.11	195.08	147.71	
GAMMA	3.029	3.008	3.007	3.076	
C-J DETN.HEAT(CAL)	711.3	608.1	478.9	333.6	
LAMDA	9.2000	9.2000	9.2000	9.2000	
VOLUM(K LITTRE/KG)	0.7646	0.7646	0.7646	0.7646	
TOTAL PRODCT(MOLE)	1.5000	1.4000	1.3000	1.2000	
V GAS (MOLES)	1.5000	1.4000	1.3000	1.2000	
V GAS (CC/MOLE)	15.4800	16.6652	17.8674	19.1958	
O2 (MOL %)	100.0000	100.0000	100.0000	100.0000	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

LIQ.03 RHO = 1.5540 G/CC EO = 3.414000E+04 CAL/MOLE

P = -3.89097023 E+00 -2.45985699 E+00LN V 3.46923947 E-01LN V*2 -4.64032292 E-02LN V*3 2.13523302 E-03LN V*4

T = 7.59677029 E+00 -4.18867648 E-01LN V 7.56862164 E-02LN V*2 -2.05908045 E-02LN V*3 1.67184114 E-03LN V*4

E = -1.67459869 E+00 3.59547257 E-01LNP 5.82065620 E-02LN P*2 4.49451059 E-03LN P*3 1.30659493 E-04LN P*4

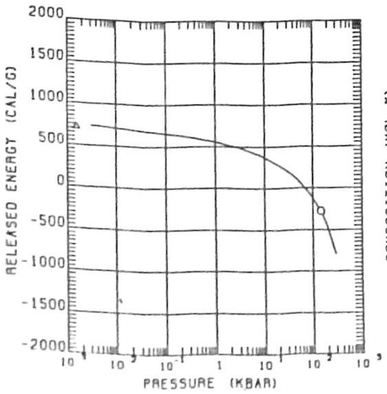
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

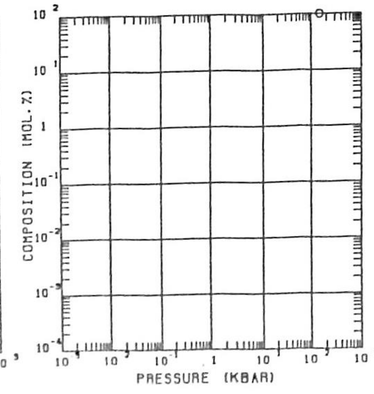
E CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G)	GAMMA	MASS VELOC. (M/SEC)
300.000 (302.930)	0.3861	3483.5 (3239.0)	-801.3	0.13353 (0.13125)	3.2536	307.4
200.000 (203.030)	0.4377	3000.0 (3001.7)	-471.0	0.11971 (0.11999)	3.1330	1035.2
* 146.713 (149.024)	0.4838	2726.0 (2833.2)	-279.9	0.11171 (0.11301)	3.0403	1530.9
100.000 (99.742)	0.5536	2557.8 (2631.7)	-120.5	0.10504 (0.10592)	2.9206	2115.3
80.000 (79.233)	0.5995	2465.9 (2524.4)	-42.4	0.10177 (0.10244)	2.8524	2421.9
60.000 (59.070)	0.6656	2355.6 (2395.2)	44.4	0.09814 (0.09854)	2.7659	2786.2
50.000 (49.142)	0.7119	2289.0 (2318.6)	92.8	0.09612 (0.09636)	2.7121	3000.3
40.000 (39.294)	0.7738	2211.7 (2229.4)	145.5	0.09391 (0.09398)	2.6470	3247.1
30.000 (29.525)	0.8636	2117.0 (2121.6)	205.0	0.09142 (0.09129)	2.5647	3542.6
20.000 (19.807)	1.0126	1990.8 (1981.4)	275.4	0.08848 (0.08814)	2.4512	3921.7
10.000 (10.033)	1.3516	1791.7 (1766.7)	368.5	0.08458 (0.08407)	2.2632	4490.8
8.000 (8.067)	1.4902	1726.5 (1703.5)	393.9	0.08352 (0.08303)	2.2047	4655.7
6.000 (6.071)	1.6991	1647.5 (1624.7)	423.0	0.08230 (0.08185)	2.1299	4859.5
5.000 (5.066)	1.8516	1597.8 (1576.4)	440.0	0.08159 (0.08118)	2.0833	4983.2
4.000 (4.054)	2.0637	1538.3 (1518.8)	459.4	0.08078 (0.08042)	2.0270	5129.5
3.000 (3.036)	2.3861	1462.9 (1446.9)	482.4	0.07981 (0.07956)	1.9561	5310.2
2.000 (2.017)	2.9571	1359.7 (1349.7)	511.8	0.07859 (0.07848)	1.8603	5550.4
1.000 (1.004)	4.3734	1191.5 (1194.2)	555.1	0.07677 (0.07694)	1.7117	5923.8
0.800 (0.799)	5.0039	1144.4 (1145.7)	566.7	0.07629 (0.07649)	1.6679	6037.1
0.600 (0.598)	5.9686	1081.7 (1085.3)	581.3	0.07568 (0.07594)	1.6159	6175.9
0.500 (0.498)	6.6917	1042.9 (1047.8)	590.2	0.07531 (0.07560)	1.5853	6260.9
0.400 (0.398)	7.7199	996.7 (1002.5)	600.5	0.07488 (0.07520)	1.5504	6362.1
0.300 (0.298)	9.3229	938.7 (945.1)	613.0	0.07435 (0.07469)	1.5096	6488.3
0.200 (0.199)	12.2548	859.5 (866.4)	629.5	0.07366 (0.07399)	1.4609	6658.3
0.100 (0.100)	19.8438	730.2 (738.7)	655.1	0.07259 (0.07281)	1.4017	6928.2
0.080 (0.079)	23.3787	695.4 (698.4)	661.7	0.07231 (0.07245)	1.3885	7013.1
0.060 (0.060)	28.7625	648.0 (649.5)	670.5	0.07194 (0.07198)	1.3762	7116.0
0.050 (0.050)	32.8246	619.3 (619.6)	675.8	0.07172 (0.07170)	1.3708	7179.4
0.040 (0.040)	38.5951	585.2 (584.4)	681.9	0.07147 (0.07136)	1.3666	7254.9
0.030 (0.030)	47.5601	543.3 (541.2)	689.3	0.07116 (0.07095)	1.3646	7348.8
0.020 (0.020)	63.9410	489.0 (484.5)	698.7	0.07077 (0.07044)	1.3676	7476.0
0.010 (0.010)	104.5932	401.4 (402.2)	713.3	0.07016 (0.06981)	1.3848	7673.3
0.008 (0.008)	123.9351	380.8 (377.2)	716.6	0.07002 (0.06969)	1.3933	7737.5
0.006 (0.006)	152.4015	351.4 (349.3)	721.3	0.06982 (0.06963)	1.4048	7813.1
0.005 (0.005)	173.8007	334.1 (332.8)	724.1	0.06970 (0.06964)	1.4126	7859.7
0.004 (0.004)	203.9720	313.7 (314.2)	727.3	0.06957 (0.06973)	1.4224	7915.0
0.003 (0.003)	250.5612	289.1 (292.5)	731.2	0.06941 (0.06996)	1.4353	7983.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

K-H-T ISENTROPE THRU C-J POINT





LIQ.03
RHO (G/CC) 1.554
E_0 (KCAL/MOLE) 34.14
D_{C-J}(M/SEC) 6167.
P_{C-J}(KBAR) 146.7
T_{C-J}(K) 2726.

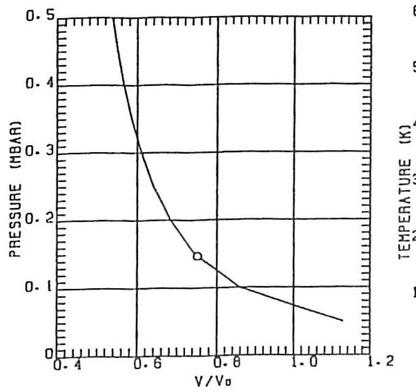
DATE 82-10-25

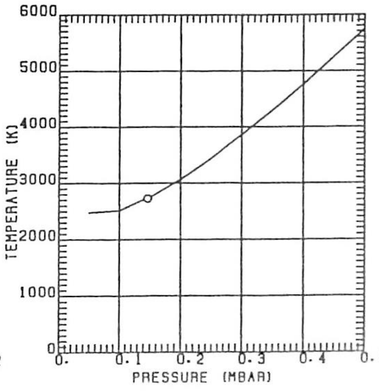
********** A K-H-T H U G O N I O T <<DATE 82-10-25>>**********

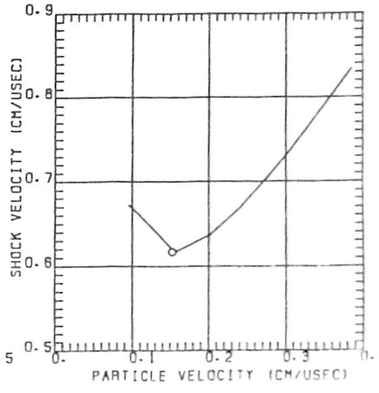
LIQ.03 RHO = 1.5540 G/CC, EO = 3.414000E+04 CAL/MOLE

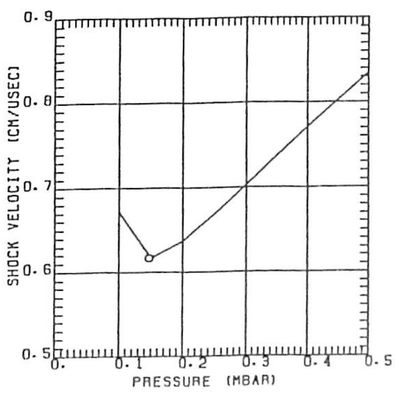
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3460	0.3545	0.3646	0.3769	0.3923	0.4121	0.4393	0.4804	0.5518	0.7239
TEMP (DEG K)	5738.4	5240.0	4758.8	4298.9	3860.1	3447.3	3068.7	2745.3	2512.7	2482.4
US (M/SEC)	8341.8	8030.2	7706.7	7373.7	7032.0	6689.3	6369.2	6170.6	6721.5	0.0
UP (M/SEC)	3857.1	3606.1	3339.9	3054.4	2745.3	2405.0	2020.7	1564.3	957.4	0.0
O2 (MOLE)	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000

K-H-T HUGONIOT









LIQ.03
RHO (G/CC) 1.554
E_0 (KCAL/MOLE) 34.14

DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES	ACETYLENE #
RHO (G/CC)	0.650
EO (KCAL/MOLE)	50.00
MOL.WEIGHT (G)	26.038
C	2.0000
H	2.0000
DETN.VEL (M/SEC)	3852.2
PARTICL.VEL(")	1005.5
C-J PRESS (KBAR)	25.2
C-J VOLUME (CC/G)	1.13690
C-J TEMP (DEG K)	3520.4
C-J S(CAL/DEG MOL)	72.88
C-J ENERGY (CAL/G)	120.83
GAMMA	2.831
C-J DETN.HEAT(CAL)	2071.0
LAMDA	5.2406
VOLUM(K LITTRE/KG)	0.7293
TOTAL PRODCT(MOLE)	2.5516
V GAS (MOLES)	0.7762
V GAS (CC/MOLE)	25.9281
V SOL C(S) (CC/G)	0.44444
H2 (MOL %)	21.5444
H (MOL %)	0.0723
CH4 (MOL %)	8.8055
C(S) (MOL %)	69.5777

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

ACETYLENE RHO = 0.6500 G/CC EO = 5.000000E+04 CAL/MOLE

LN P = -3.32090759 E+00 -2.60605431 E+00LN V 5.90900719 E-01LN V*2 -9.31406617 E-02LN V*3 5.08382171 E-03LN V*4

LN T = 8.21051407 E+00 -1.87551558 E-01LN V 3.69137004 E-02LN V*2 -6.74223527 E-03LN V*3 4.03770944 E-04LN V*4

LN E = -1.48886490 E+00 3.49463820 E-01LNP 5.54968417 E-02LN P*2 4.87061217 E-03LN P*3 1.49498999 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
100.000 (91.355)	0.7189	4095.5 (3931.1)	-746.1	0.13122 (0.12815)	3.0273	0.0
80.000 (75.222)	0.7673	3945.9 (3877.4)	-585.4	0.12449 (0.12370)	2.9391	0.0
60.000 (58.727)	0.8361	3803.3 (3809.7)	-427.0	0.11787 (0.11861)	2.8267	0.0
50.000 (50.179)	0.8846	3733.3 (3767.2)	-347.5	0.11454 (0.11572)	2.7553	214.1
40.000 (41.301)	0.9504	3661.8 (3715.0)	-266.1	0.11113 (0.11246)	2.6669	479.8
30.000 (30.272)	1.0713	3558.6 (3632.9)	-164.1	0.10687 (0.10869)	2.5260	827.6
* 25.178 (26.097)	1.1370	3520.4 (3594.0)	-120.8	0.10505 (0.10658)	2.4589	1005.5
20.000 (21.214)	1.2390	3481.2 (3540.3)	-76.2	0.10319 (0.10401)	2.3655	1228.4
10.000 (10.724)	1.6871	3346.7 (3366.3)	52.6	0.09780 (0.09733)	2.0615	1905.1
8.000 (8.501)	1.8938	3297.4 (3308.0)	94.4	0.09605 (0.09543)	1.9600	2119.1
6.000 (6.260)	2.2261	3234.9 (3231.7)	144.9	0.09394 (0.09311)	1.8288	2391.1
5.000 (5.147)	2.4836	3193.2 (3183.2)	177.4	0.09258 (0.09171)	1.7469	2560.2
4.000 (4.045)	2.8627	3141.9 (3123.6)	216.0	0.09096 (0.09005)	1.6485	2764.3
3.000 (2.962)	3.4836	3073.5 (3046.7)	265.6	0.08889 (0.08797)	1.5268	3022.6
2.000 (1.916)	4.7091	2971.7 (2938.9)	336.4	0.08593 (0.08515)	1.3701	3378.0
1.000 (0.934)	8.3420	2785.8 (2758.9)	459.7	0.08076 (0.08048)	1.1624	3962.4
0.800 (0.749)	10.1305	2723.4 (2702.8)	500.3	0.07907 (0.07899)	1.1153	4144.0
0.600 (0.566)	13.0850	2645.4 (2631.6)	550.4	0.07697 (0.07708)	1.0690	4375.2
0.500 (0.476)	15.4073	2595.1 (2587.3)	582.9	0.07561 (0.07587)	1.0480	4519.5
0.400 (0.386)	18.8563	2536.0 (2533.5)	620.7	0.07403 (0.07439)	1.0302	4695.5
0.300 (0.295)	24.5000	2461.4 (2464.9)	668.4	0.07203 (0.07249)	1.0193	4921.2
0.200 (0.203)	35.4651	2359.3 (2369.4)	733.8	0.06930 (0.06980)	1.0229	5238.4
0.100 (0.105)	66.6952	2192.7 (2208.5)	841.1	0.06481 (0.06526)	1.0649	5781.7
0.080 (0.084)	81.7061	2141.6 (2157.2)	874.1	0.06343 (0.06382)	1.0838	5957.2
0.060 (0.063)	106.1722	2078.4 (2091.5)	914.9	0.06172 (0.06198)	1.1094	6183.6
0.050 (0.053)	125.2346	2038.2 (2050.4)	941.1	0.06063 (0.06084)	1.1252	6326.0
0.040 (0.042)	153.3809	1991.4 (2000.5)	971.3	0.05936 (0.05946)	1.1435	6500.3
0.030 (0.031)	199.1398	1932.8 (1937.1)	1009.2	0.05777 (0.05772)	1.1636	6722.8
0.020 (0.020)	287.5200	1853.0 (1850.5)	1060.9	0.05561 (0.05538)	1.1813	7030.3
0.010 (0.010)	537.3723	1722.5 (1712.7)	1145.4	0.05208 (0.05170)	1.1673	7532.6
0.008 (0.008)	657.0098	1682.5 (1671.8)	1171.3	0.05099 (0.05062)	1.1469	7686.9
0.006 (0.006)	851.5273	1632.8 (1622.0)	1203.3	0.04966 (0.04932)	1.1066	7880.1
0.005 (0.005)	1002.8306	1601.1 (1592.5)	1223.7	0.04880 (0.04855)	1.0721	7998.5
0.004 (0.004)	1225.8884	1564.2 (1558.5)	1247.4	0.04781 (0.04768)	1.0194	8140.0
0.003 (0.003)	1587.8728	1517.9 (1518.6)	1277.1	0.04657 (0.04666)	0.9329	8316.1
0.002 (0.002)	2285.4224	1454.6 (1470.8)	1317.5	0.04488 (0.04545)	0.7722	8550.8

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

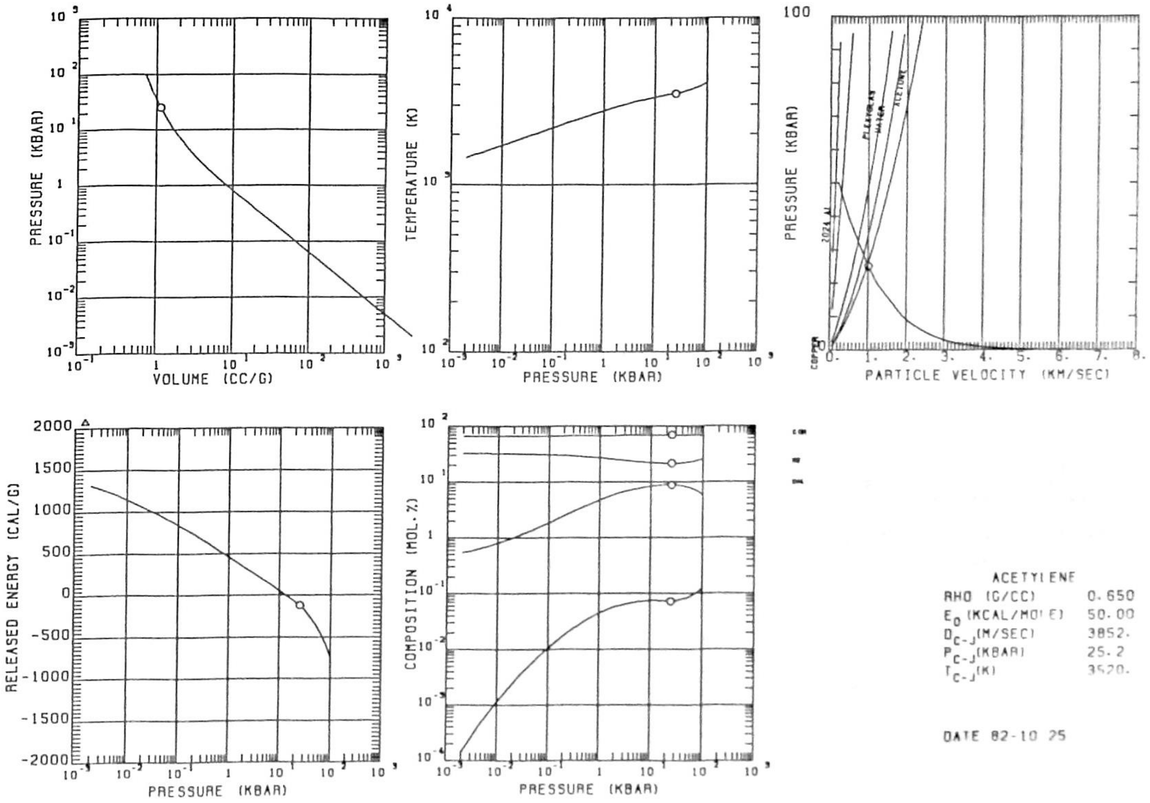
ACETYLENE RHO = 0.6500 G/CC EO = 5.000000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2	H	CH4	C(S)
25.178	0.54973	0.00184	0.22467	1.77533
20.000	0.55002	0.00188	0.22452	1.77548
10.000	0.57080	0.00191	0.21412	1.78588
8.000	0.58141	0.00188	0.20882	1.79118
6.000	0.59761	0.00185	0.20073	1.79927
5.000	0.60884	0.00181	0.19513	1.80487
4.000	0.62389	0.00176	0.18761	1.81239
3.000	0.64514	0.00168	0.17701	1.82299
2.000	0.67816	0.00153	0.16054	1.83946
1.000	0.73902	0.00121	0.13019	1.86981
0.800	0.75818	0.00110	0.12064	1.87936
0.600	0.78234	0.00096	0.10859	1.89141
0.500	0.79658	0.00087	0.10149	1.89851
0.400	0.81343	0.00077	0.09309	1.90691
0.300	0.83352	0.00065	0.08308	1.91692
0.200	0.85850	0.00050	0.07063	1.92937
0.100	0.89251	0.00030	0.05367	1.94633
0.080	0.90144	0.00025	0.04922	1.95078
0.060	0.91190	0.00020	0.04400	1.95600
0.050	0.91762	0.00017	0.04115	1.95885
0.040	0.92425	0.00014	0.03784	1.96216
0.030	0.93184	0.00011	0.03405	1.96595
0.020	0.94087	0.00007	0.02955	1.97045
0.010	0.95247	0.00003	0.02376	1.97624
0.008	0.95542	0.00003	0.02228	1.97772
0.006	0.95887	0.00002	0.02056	1.97944
0.005	0.96065	0.00001	0.01967	1.98033
0.004	0.96277	0.00001	0.01861	1.98139
0.003	0.96515	0.00001	0.01742	1.98258
0.002	0.96788	0.00000	0.01606	1.98394
30.000	0.55367	0.00186	0.22270	1.77730
40.000	0.56486	0.00204	0.21706	1.78294
50.000	0.58145	0.00216	0.20874	1.79126
60.000	0.60042	0.00231	0.19921	1.80079
80.000	0.64135	0.00272	0.17864	1.82136
100.000	0.68231	0.00329	0.15802	1.84198

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT

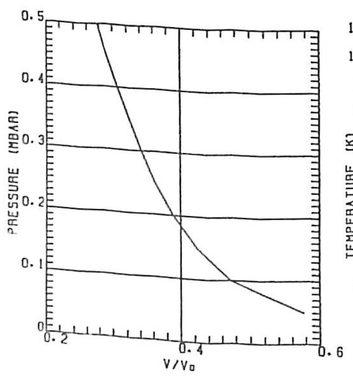


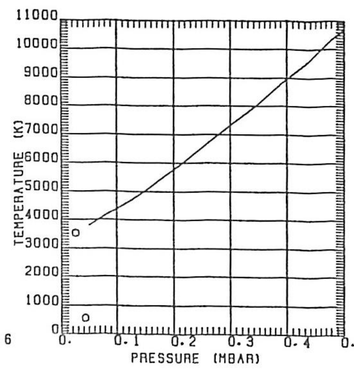
********** A K-H-T H U G O N I O T <<DATE 82-10-25>>**********

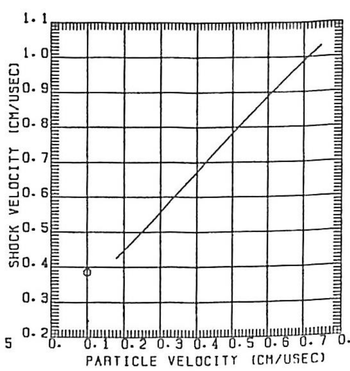
ACETYLENE RHO = 0.6500 G/CC, EO = 5.000000E+04 CAL/MOLE

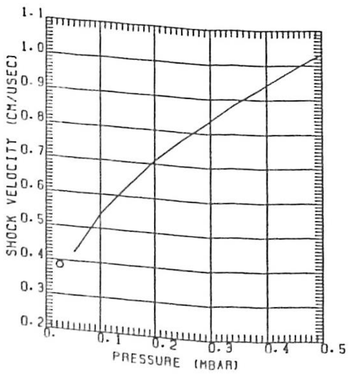
PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.4270	0.4489	0.4722	0.4977	0.5261	0.5589	0.5987	0.6510	0.7280	0.8876
TEMP	(DEG K)	10687.8	9816.1	8964.4	8132.5	7321.3	6532.6	5769.9	5038.4	4377.5	3785.7
US	(M/SEC)	10318.8	9886.9	9422.9	8921.5	8374.9	7772.1	7097.2	6324.8	5404.1	4264.2
UP	(M/SEC)	7454.6	7002.3	6530.7	6035.5	5510.9	4948.6	4335.4	3648.6	2846.8	1803.9
H2	(MOLE)	0.4153	0.4627	0.5147	0.5698	0.6246	0.6749	0.7160	0.7444	0.6822	0.5847
H	(MOLE)	0.0032	0.0037	0.0043	0.0050	0.0059	0.0069	0.0082	0.0099	0.0051	0.0024
CH4	(MOLE)	0.2915	0.2677	0.2416	0.2139	0.1862	0.1608	0.1399	0.1253	0.1576	0.2070
C(S)	(MOLE)	1.7085	1.7323	1.7584	1.7861	1.8138	1.8392	1.8601	1.8747	1.8424	1.7930

K-H-T HUGONIOT









ACETYLENE
RHO (G/CC) 0.650
E_0 (KCAL/MOLE) 50.00

DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES		CYANURIC TRIAZIDE	#
RHO	(G/CC)	1.150	
EO	(KCAL/MOLE)	218.59	
MOL.WEIGHT	(G)	204.114	
C		3.0000	
N		12.0000	
DETN.VEL	(M/SEC)	5856.9	
PARTICL.VEL(")		1480.5	
C-J PRESS	(KBAR)	99.7	
C-J VOLUME	(CC/G)	0.64976	
C-J TEMP	(DEG K)	3872.0	
C-J S(CAL/DEG MOL)		52.74	
C-J ENERGY	(CAL/G)	261.93	
GAMMA		2.956	
C-J DETN.HEAT(CAL)		1070.9	
LAMDA		9.8000	
VOLUM(K LITTRE/KG)		0.7192	
TOTAL PRODCT(MOLE)		9.0000	
V GAS	(MOLES)	6.0000	
V GAS	(CC/MOLE)	19.9385	
V SOL C(S)	(CC/G)	0.36067	
N2	(MOL %)	66.6667	
C(S)	(MOL %)	33.3333	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

CYANURIC TRIAZIDE RHO = 1.1500 G/CC EO = 2.185900E+05 CAL/MOLE

LN P = -3.45458984 E+00 -2.46839237 E+00LN V 4.30561960 E-01LN V*2 -6.44797683 E-02LN V*3 3.49624525 E-03LN V*4

LN T = 8.13764286 E+00 -3.07948291 E-01LN V 5.26619442 E-02LN V*2 -1.06412135 E-02LN V*3 6.77859876 E-04LN V*4

LN E = -1.62601089 E+00 3.41842234 E-01LNP 5.10795787 E-02LN P*2 3.98230925 E-03LN P*3 1.17270029 E-04LN P*4

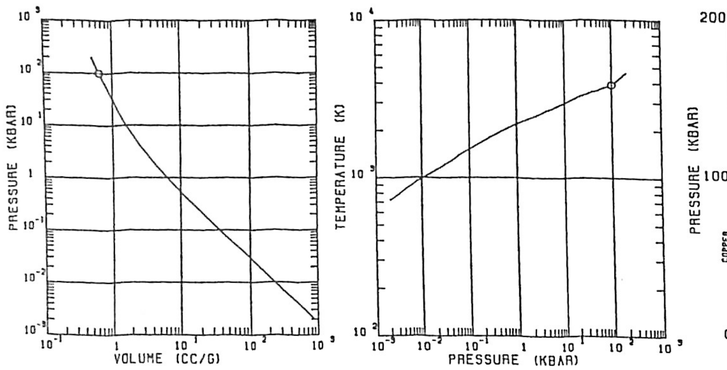
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

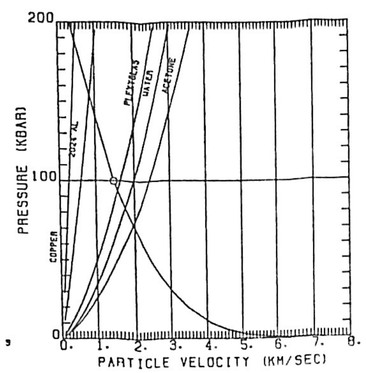
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

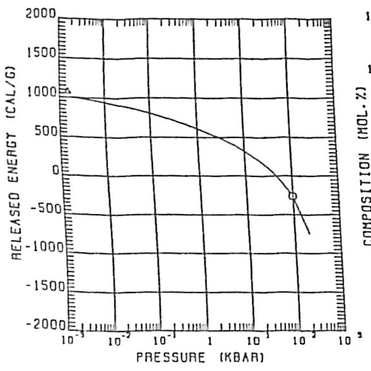
PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (199.647)	0.5156	4628.3 (4306.8)	-742.4	0.13106 (0.12749)	3.1277	320.6
100.000 (100.006)	0.6492	3874.4 (3949.7)	-263.3	0.11102 (0.11218)	2.8776	1476.5
100.000 (100.006)	0.6492	3874.4 (3949.7)	-263.3	0.11102 (0.11218)	2.8776	1476.5
* 99.717 (99.729)	0.6498	3872.0 (3948.3)	-261.7	0.11095 (0.11213)	2.8766	1480.5
80.000 (79.632)	0.7035	3778.9 (3838.9)	-176.9	0.10740 (0.10829)	2.7958	1808.5
60.000 (59.671)	0.7815	3658.9 (3703.1)	-78.5	0.10328 (0.10385)	2.6927	2202.4
50.000 (49.819)	0.8364	3584.2 (3620.7)	-22.6	0.10094 (0.10134)	2.6285	2434.6
40.000 (39.998)	0.9104	3496.9 (3522.9)	39.2	0.09836 (0.09854)	2.5510	2703.9
30.000 (29.779)	1.0244	3387.1 (3395.6)	109.3	0.09543 (0.09531)	2.4477	3044.6
20.000 (20.129)	1.2077	3236.1 (3233.5)	196.8	0.09177 (0.09140)	2.3127	3463.6
10.000 (10.162)	1.6488	2980.2 (2967.7)	321.3	0.08656 (0.08602)	2.0844	4118.3
8.000 (8.119)	1.8398	2899.4 (2884.7)	356.0	0.08510 (0.08456)	2.0121	4315.6
6.000 (6.065)	2.1341	2796.2 (2779.6)	397.9	0.08335 (0.08284)	1.9207	4560.9
5.000 (5.038)	2.3538	2730.6 (2714.3)	423.3	0.08229 (0.08182)	1.8642	4710.9
4.000 (4.013)	2.6656	2652.5 (2635.8)	452.5	0.08107 (0.08065)	1.7969	4889.5
3.000 (2.993)	3.1504	2553.7 (2536.9)	488.1	0.07958 (0.07924)	1.7138	5111.2
2.000 (1.984)	4.0369	2417.8 (2402.1)	534.9	0.07762 (0.07742)	1.6054	5408.6
1.000 (0.990)	6.3744	2191.0 (2182.6)	608.1	0.07456 (0.07460)	1.4482	5882.9
0.800 (0.791)	7.4573	2121.8 (2113.8)	629.5	0.07366 (0.07375)	1.4057	6029.2
0.600 (0.594)	9.1803	2031.8 (2026.7)	656.7	0.07252 (0.07269)	1.3576	6213.1
0.500 (0.495)	10.5048	1974.8 (1972.4)	673.6	0.07182 (0.07204)	1.3312	6327.1
0.400 (0.397)	12.4351	1906.5 (1906.4)	693.6	0.07098 (0.07125)	1.3029	6464.9
0.300 (0.298)	15.5240	1819.8 (1822.7)	718.5	0.06994 (0.07025)	1.2732	6638.9
0.200 (0.200)	21.3615	1700.7 (1707.2)	752.1	0.06853 (0.06887)	1.2438	6877.4
0.100 (0.101)	37.2158	1505.9 (1518.2)	805.7	0.06629 (0.06661)	1.2226	7266.7
0.080 (0.081)	44.6789	1450.5 (1458.9)	820.6	0.06567 (0.06590)	1.2220	7389.2
0.060 (0.061)	56.4478	1378.0 (1385.0)	840.0	0.06486 (0.06501)	1.2244	7542.4
0.050 (0.051)	65.4546	1333.3 (1339.4)	851.8	0.06436 (0.06446)	1.2274	7637.5
0.040 (0.040)	78.4976	1280.5 (1284.8)	865.7	0.06378 (0.06381)	1.2321	7752.1
0.030 (0.030)	99.1928	1214.8 (1216.6)	882.7	0.06307 (0.06300)	1.2391	7896.6
0.020 (0.020)	137.8507	1126.5 (1125.2)	905.4	0.06212 (0.06192)	1.2487	8093.8
0.010 (0.010)	241.0361	985.6 (982.9)	940.6	0.06065 (0.06033)	1.2570	8411.8
0.008 (0.008)	289.3196	946.6 (940.2)	950.2	0.06025 (0.05991)	1.2555	8510.9
0.006 (0.006)	364.7122	895.0 (888.9)	962.6	0.05972 (0.05943)	1.2492	8633.2
0.005 (0.005)	422.1648	863.4 (858.3)	970.2	0.05941 (0.05917)	1.2423	8708.5
0.004 (0.004)	504.8447	826.1 (822.6)	979.0	0.05904 (0.05892)	1.2304	8798.4
0.003 (0.003)	635.2766	779.7 (779.9)	989.7	0.05859 (0.05869)	1.2086	8910.5
0.002 (0.002)	876.7603	717.4 (725.8)	1003.9	0.05800 (0.05858)	1.1641	9061.2

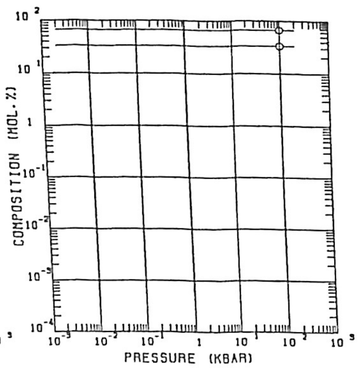
* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

K-H-T ISENTROPE THRU C-J POINT









CYANURIC TRIAZIDE	
RHO (G/CC)	1.150
E_0 (KCAL/MOLE)	218.59
D_{C-J}(M/SEC)	5857.
P_{C-J}(KBAR)	99.7
T_{C-J}(K)	3872.

DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES	LIQ. CO	#
RHO (G/CC)	0.807	
EO (KCAL/MOLE)	-26.42	
MOL.WEIGHT (G)	28.011	
C	1.0000	
O	1.0000	
DETN.VEL (M/SEC)	3261.6	
PARTICL.VEL(")	904.1	
C-J PRESS (KBAR)	23.8	
C-J VOLUME (CC/G)	0.89570	
C-J TEMP (DEG K)	2242.6	
C-J S(CAL/DEG MOL)	59.68	
C-J ENERGY (CAL/G)	97.70	
GAMMA	2.608	
C-J DETN.HEAT(CAL)	533.6	
LAMDA	12.1906	
VOLUM(K LITTRE/KG)	0.5566	
TOTAL PRODCT(MOLE)	1.0000	
V GAS (MOLES)	0.6373	
V GAS (CC/MOLE)	36.3311	
V SOL C(S) (CC/G)	0.44444	
CO2 (MOL %)	36.2746	
CO (MOL %)	27.4531	
O2 (MOL %)	0.0001	
C(S) (MOL %)	36.2722	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

LIQ. CO RHO = 0.8070 G/CC EO = -2.642000E+04 CAL/MOLE

LN P = -4.03429890 E+00 -2.53272057 E+00LN V 4.53928113 E-01LN V*2 -6.35895133 E-02LN V*3 3.30270058 E-03LN V*4

LN T = 7.69122696 E+00 -4.79203939 E-01LN V 1.81679070 E-01LN V*2 -3.39790806 E-02LN V*3 2.21907510 E-03LN V*4

LN E = -1.49841881 E+00 3.74726295 E-01LNP 6.18811697 E-02LN P*2 4.72481549 E-03LN P*3 1.32209243 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
100.000 (99.880)	0.5430	3372.3 (3163.9)	-619.4	0.12592 (0.12404)	3.1611	0.0
80.000 (80.379)	0.5822	3098.5 (3008.5)	-486.6	0.12036 (0.11993)	3.0818	0.0
60.000 (60.371)	0.6399	2819.4 (2820.0)	-353.9	0.11481 (0.11535)	2.9773	0.0
50.000 (50.262)	0.6810	2675.1 (2708.5)	-287.1	0.11201 (0.11281)	2.9104	153.9
40.000 (40.113)	0.7367	2523.4 (2580.2)	-218.9	0.10916 (0.11005)	2.8284	396.4
30.000 (29.536)	0.8227	2355.2 (2421.0)	-144.6	0.10605 (0.10696)	2.7173	691.2
* 23.795 (23.524)	0.8957	2242.6 (2312.9)	-97.7	0.10409 (0.10482)	2.6350	904.0
20.000 (19.785)	0.9573	2170.3 (2236.1)	-69.1	0.10289 (0.10339)	2.5727	1055.6
10.000 (9.979)	1.2660	1936.2 (1974.1)	21.0	0.09912 (0.09889)	2.3290	1599.5
8.000 (8.014)	1.3932	1875.6 (1902.8)	44.0	0.09816 (0.09778)	2.2522	1757.4
6.000 (6.038)	1.5844	1805.2 (1818.9)	70.9	0.09703 (0.09652)	2.1540	1951.3
5.000 (5.043)	1.7246	1764.2 (1770.0)	86.9	0.09636 (0.09582)	2.0924	2069.3
4.000 (4.040)	1.9211	1718.0 (1714.3)	105.0	0.09561 (0.09505)	2.0176	2209.5
3.000 (3.029)	2.2235	1663.4 (1648.9)	126.7	0.09470 (0.09417)	1.9224	2383.9
2.000 (2.012)	2.7724	1594.7 (1568.5)	154.7	0.09353 (0.09310)	1.7913	2619.0
1.000 (0.997)	4.2078	1494.7 (1460.3)	196.7	0.09177 (0.09158)	1.5829	2994.6
0.800 (0.797)	4.8592	1465.3 (1432.7)	210.1	0.09121 (0.09115)	1.5221	3108.5
0.600 (0.598)	5.9004	1429.9 (1401.1)	226.2	0.09053 (0.09060)	1.4484	3252.2
0.500 (0.497)	6.7110	1409.0 (1383.1)	235.4	0.09015 (0.09026)	1.4046	3342.2
0.400 (0.398)	7.8865	1383.4 (1363.1)	247.5	0.08964 (0.08984)	1.3551	3450.0
0.300 (0.299)	9.7906	1351.6 (1339.7)	263.1	0.08899 (0.08930)	1.2976	3587.1
0.200 (0.200)	13.4817	1308.5 (1309.7)	284.5	0.08810 (0.08852)	1.2295	3777.3
0.100 (0.099)	24.2878	1243.7 (1259.1)	314.3	0.08685 (0.08711)	1.1491	4100.2
0.080 (0.080)	29.3039	1220.0 (1242.4)	329.2	0.08623 (0.08664)	1.1336	4198.1
0.060 (0.060)	37.9861	1197.2 (1218.2)	338.3	0.08585 (0.08602)	1.1187	4330.4
0.050 (0.050)	44.3613	1178.3 (1203.0)	351.0	0.08531 (0.08562)	1.1129	4408.2
0.040 (0.040)	54.4703	1162.2 (1181.9)	356.8	0.08507 (0.08513)	1.1081	4509.9
0.030 (0.030)	70.5096	1138.7 (1154.2)	369.3	0.08455 (0.08450)	1.1059	4636.0
0.020 (0.020)	101.6084	1106.9 (1113.5)	386.7	0.08382 (0.08363)	1.1075	4811.4
0.010 (0.010)	190.2905	1055.9 (1045.2)	415.3	0.08262 (0.08227)	1.1129	5105.3
0.008 (0.008)	233.0701	1040.4 (1025.6)	424.0	0.08226 (0.08189)	1.1127	5198.2
0.006 (0.006)	302.8540	1021.1 (1003.5)	435.1	0.08180 (0.08146)	1.1092	5316.5
0.005 (0.005)	357.4045	1009.0 (992.1)	442.2	0.08150 (0.08123)	1.1046	5390.3
0.004 (0.004)	438.1355	994.7 (981.4)	450.4	0.08116 (0.08101)	1.0956	5480.0
0.003 (0.003)	569.9392	976.9 (974.4)	460.7	0.08073 (0.08081)	1.0779	5593.8
0.002 (0.002)	826.0652	952.8 (981.4)	474.7	0.08014 (0.08078)	1.0382	5750.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

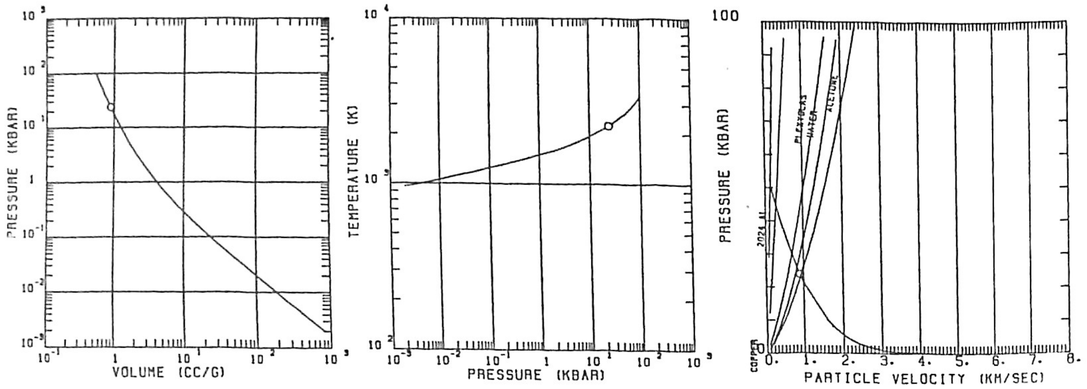
LIQ. CO RHO = 0.8070 G/CC EO = -2.642000E+04 CAL/MOLE

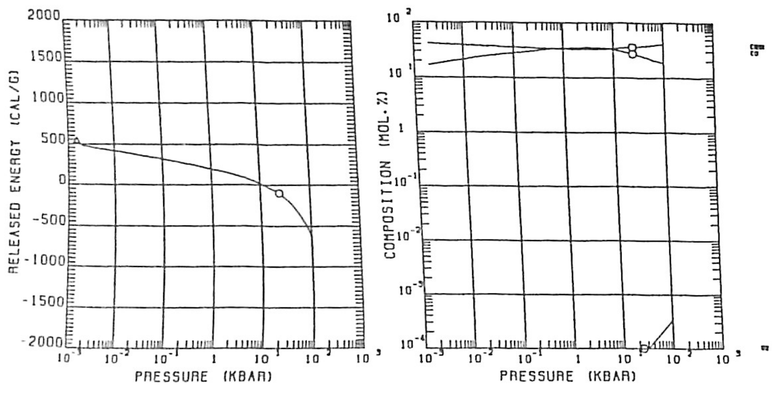
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	CO2	CO	O2	C(S)
23.795	0.36274	0.27452	0.00000	0.36273
20.000	0.35618	0.28766	0.00000	0.35614
10.000	0.33651	0.32701	0.00000	0.33647
8.000	0.33231	0.33539	0.00000	0.33229
6.000	0.32843	0.34315	0.00000	0.32841
5.000	0.32685	0.34632	0.00000	0.32681
4.000	0.32553	0.34894	0.00000	0.32552
3.000	0.32487	0.35027	0.00000	0.32484
2.000	0.32547	0.34911	0.00000	0.32542
1.000	0.32936	0.34131	0.00000	0.32933
0.800	0.33174	0.33654	0.00000	0.33171
0.600	0.33484	0.33036	0.00000	0.33481
0.500	0.33653	0.32700	0.00000	0.33647
0.400	0.33943	0.32116	0.00000	0.33940
0.300	0.34355	0.31296	0.00000	0.34351
0.200	0.34981	0.30037	0.00000	0.34981
0.100	0.35782	0.28444	0.00000	0.35776
0.080	0.36386	0.27233	0.00000	0.36382
0.060	0.36577	0.26855	0.00000	0.36569
0.050	0.37125	0.25757	0.00000	0.37119
0.040	0.37221	0.25563	0.00000	0.37216
0.030	0.37660	0.24684	0.00000	0.37656
0.020	0.38281	0.23443	0.00000	0.38277
0.010	0.39336	0.21338	0.00000	0.39326
0.008	0.39662	0.20680	0.00000	0.39658
0.006	0.40077	0.19856	0.00000	0.40068
0.005	0.40353	0.19300	0.00000	0.40347
0.004	0.40663	0.18680	0.00000	0.40657
0.003	0.41054	0.17901	0.00000	0.41048
0.002	0.41592	0.16824	0.00000	0.41583
30.000	0.37095	0.25810	0.00000	0.37094
40.000	0.37923	0.24153	0.00000	0.37924
50.000	0.38735	0.22534	0.00000	0.38733
60.000	0.39343	0.21313	0.00000	0.39345
80.000	0.40151	0.19698	0.00000	0.40151
100.000	0.40565	0.18869	0.00000	0.40566

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT





LIQ. CO

RHO (G/CC)	0.807
E_0 (KCAL/MOLE)	-26.42
D_{C-J}(M/SEC)	3262.
P_{C-J}(KBAR)	23.8
T_{C-J}(K)	2243.

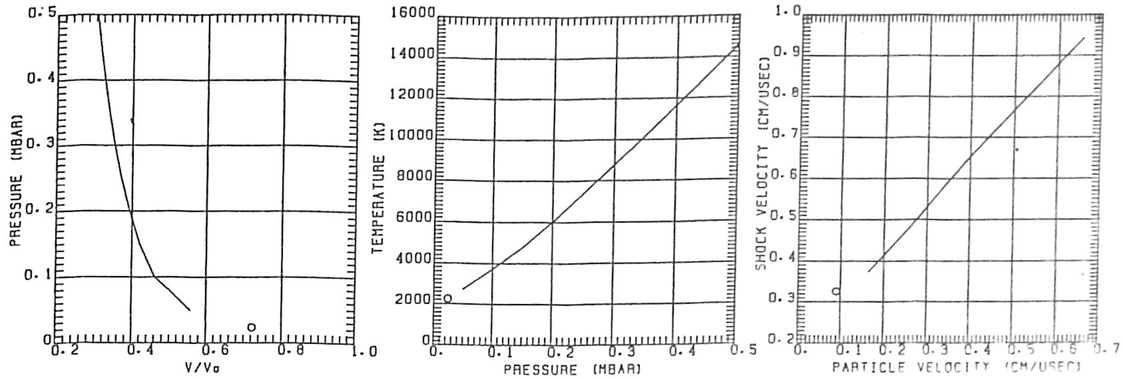
DATE 82-10-25

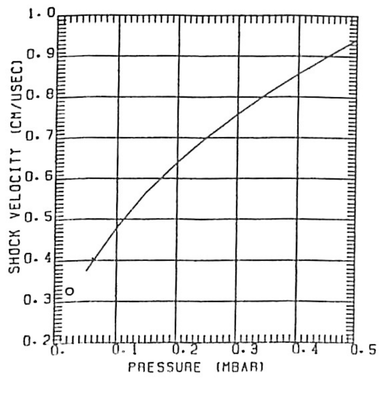
********** A K-H-T H U G O N I O T <<DATE 82-10-25>>**********

LIQ. CO RHO = 0.8070 G/CC, EO = -2.642000E+04 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3751	0.3876	0.4016	0.4176	0.4363	0.4585	0.4864	0.5221	0.5717	0.6915
TEMP	(DEG K)	14586.0	13107.1	11642.5	10194.8	8768.2	7371.2	6016.2	4763.7	3722.7	2743.0
US	(M/SEC)	9426.5	9008.0	8563.3	8087.8	7574.5	7012.3	6387.2	5667.3	4796.3	3744.1
UP	(M/SEC)	6572.7	6190.3	5788.2	5362.4	4907.9	4417.8	3880.1	3279.7	2583.6	1654.8
CO2	(MOLE)	0.4073	0.3977	0.3868	0.3746	0.3611	0.3472	0.3333	0.3292	0.3556	0.3730
CO	(MOLE)	0.1850	0.2042	0.2259	0.2503	0.2774	0.3052	0.3330	0.3413	0.2887	0.2540
O2	(MOLE)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0000	0.0000
C(S)	(MOLE)	0.4077	0.3981	0.3873	0.3751	0.3615	0.3476	0.3337	0.3295	0.3556	0.3730

K-H-T HUGONIOT





LIQ. CO
RHO (G/CC) 0.807
E_0 (KCAL/MOLE) -26.42

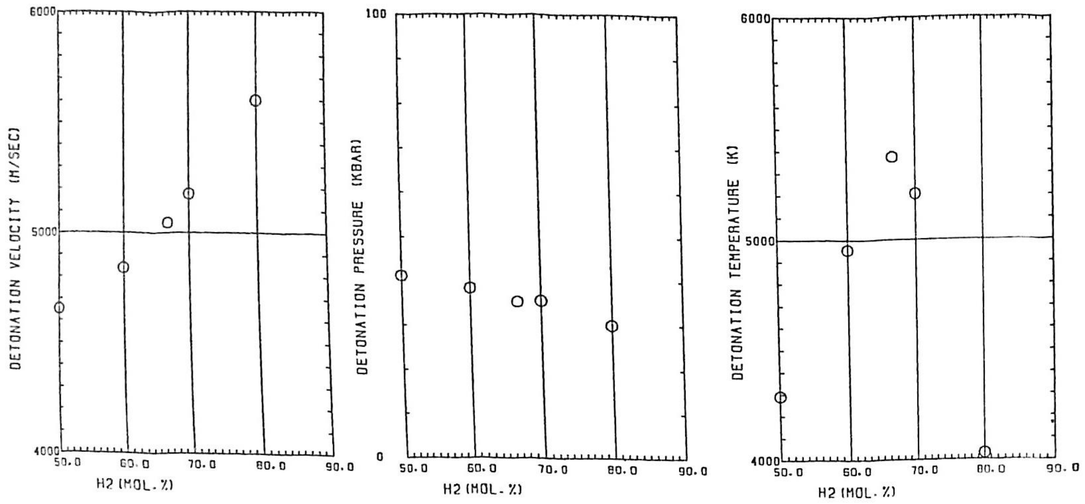
DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES		LIQ. H2/O2 0.5/0.5 MOLE	#LIQ. H2/O2 0.6/0.4 MOLE	#LIQ. H2/O2 STOICHIO.	#LIQ. H2/O2 0.7/0.3 MOLE	#LIQ. H2/O2 0.8/0.2 MOLE #
RHO	(G/CC)	0.621	0.508	0.434	0.398	0.287
EO	(KCAL/MOLE)	-0.75	-0.61	-0.52	-0.48	-0.34
MOL.WEIGHT	(G)	17.007	14.009	12.010	11.011	8.013
H		1.0000	1.2000	1.3333	1.4000	1.6000
O		1.0000	0.8000	0.6667	0.6000	0.4000
DETN.VEL	(M/SEC)	4652.8	4839.3	5045.0	5175.2	5599.5
PARTICL.VEL	(")	1425.0	1560.6	1618.0	1730.1	1874.2
C-J PRESS	(KBAR)	41.2	38.4	35.4	35.6	30.1
C-J VOLUME	(CC/G)	1.11714	1.33369	1.56519	1.67261	2.31812
C-J TEMP	(DEG K)	4290.7	4955.2	5373.0	5206.9	4027.9
C-J S	(CAL/DEG MOL)	54.44	55.75	55.95	53.63	43.90
C-J ENERGY	(CAL/G)	242.64	291.05	312.87	357.73	419.74
GAMMA		2.265	2.101	2.118	1.991	1.988
C-J DETN.HEAT	(CAL)	1552.6	2196.2	2816.3	2917.3	2802.1
LAMDA		7.0442	6.3818	5.9112	5.5493	4.4851
VOLUM	(K LITTRE/KG)	1.0957	1.2630	1.4252	1.5917	2.4515
TOTAL PRODCT	(MOLE)	0.7617	0.7232	0.6996	0.7164	0.8029
V GAS	(MOLES)	0.7617	0.7232	0.6996	0.7164	0.8029
V GAS	(CC/MOLE)	24.9441	25.8341	26.8689	25.7089	23.1339
H2O	(MOL %)	62.6263	76.8099	86.4438	80.1544	49.5967
H2	(MOL %)	0.2521	1.4530	5.5514	15.4315	49.6873
O2	(MOL %)	31.5868	12.3399	1.4184	0.1522	0.0003
OH	(MOL %)	5.4895	9.1259	6.0078	3.2986	0.2228
H	(MOL %)	0.0453	0.2712	0.5785	0.9633	0.4929

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES		HYDRAZINE AZIDE	#
RHO	(G/CC)	1.000	
EO	(KCAL/MOLE)	40.00	
MOL.WEIGHT	(G)	75.073	
N		5.0000	
H		5.0000	
DETN.VEL	(M/SEC)	6394.4	
PARTICL.VEL(")		1590.9	
C-J PRESS	(KBAR)	101.7	
C-J VOLUME	(CC/G)	0.75120	
C-J TEMP	(DEG K)	1722.9	
C-J S	(CAL/DEG MOL)	44.07	
C-J ENERGY	(CAL/G)	302.47	
GAMMA		3.019	
C-J DETN.HEAT	(CAL)	762.5	
LAMDA		9.1928	
VOLUM	(K LITTRE/KG)	1.1172	
TOTAL PRODCT	(MOLE)	3.4281	
V GAS	(MOLES)	3.4281	
V GAS	(CC/MOLE)	16.4508	
N2	(MOL %)	50.0000	
H2	(MOL %)	4.1474	
NH3	(MOL %)	45.8526	
H	(MOL %)	0.0000	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-25>> **********

EXPLOSIVES		LIQ.NO	#
RHO	(G/CC)	1.300	
EO	(KCAL/MOLE)	17.00	
MOL.WEIGHT	(G)	30.006	
N		1.0000	
O		1.0000	
DETN.VEL	(M/SEC)	5639.2	
PARTICL.VEL(")		1411.8	
C-J PRESS	(KBAR)	103.5	
C-J VOLUME	(CC/G)	0.57665	
C-J TEMP	(DEG K)	2155.6	
C-J S	(CAL/DEG MOL)	44.74	
C-J ENERGY	(CAL/G)	238.18	
GAMMA		2.994	
C-J DETN.HEAT	(CAL)	552.0	
LAMDA		9.4929	
VOLUM	(K LITTRE/KG)	0.8153	
TOTAL PRODCT	(MOLE)	1.0000	
V GAS	(MOLES)	1.0000	
V GAS	(CC/MOLE)	17.3032	
N2	(MOL %)	48.9907	
O2	(MOL %)	48.9907	
NO	(MOL %)	2.0187	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

LIQ.NO RHO = 1.3000 G/CC EO = 1.700000E+04 CAL/MOLE

LN P = -3.78984547 E+00 -2.58303452 E+00LN V 3.48898053 E-01LN V*2 -4.12286706 E-02LN V*3 1.42795336 E-03LN V*4

LN T = 7.43274498 E+00 -4.67890084 E-01LN V 1.14788771 E-01LN V*2 -3.76870334 E-02LN V*3 3.75747122 E-03LN V*4

LN E = -1.54938126 E+00 4.25062716 E-01LNP 7.51426816 E-02LN P*2 6.17972761 E-03LN P*3 1.89508282 E-04LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
300.000 (299.489)	0.4133	3156.0 (2875.8)	-1025.9	0.14293 (0.14049)	3.3001	0.0
200.000 (201.946)	0.4667	2652.9 (2628.0)	-637.1	0.12666 (0.12703)	3.1892	381.5
* 103.497 (104.864)	0.5767	2155.6 (2279.6)	-238.2	0.10997 (0.11147)	3.0056	1411.8
100.000 (100.883)	0.5841	2155.6 (2261.2)	-228.2	0.10955 (0.11082)	2.9948	1466.4
80.000 (80.115)	0.6314	2070.0 (2156.0)	-144.5	0.10605 (0.10694)	2.9306	1779.3
60.000 (59.519)	0.6998	1977.8 (2030.8)	-54.7	0.10229 (0.10267)	2.8481	2153.9
50.000 (49.391)	0.7476	1921.9 (1957.7)	-4.9	0.10021 (0.10033)	2.7966	2373.8
40.000 (39.405)	0.8112	1856.8 (1874.3)	49.0	0.09795 (0.09780)	2.7345	2625.6
30.000 (29.525)	0.9030	1776.4 (1775.3)	109.5	0.09542 (0.09501)	2.6555	2926.1
20.000 (19.746)	1.0540	1669.1 (1649.8)	180.4	0.09245 (0.09183)	2.5467	3309.0
10.000 (9.975)	1.3921	1502.2 (1464.4)	272.0	0.08862 (0.08790)	2.3655	3877.4
8.000 (8.031)	1.5274	1445.3 (1411.5)	296.9	0.08758 (0.08694)	2.3092	4039.4
6.000 (6.051)	1.7300	1378.4 (1346.0)	324.8	0.08641 (0.08587)	2.2368	4239.3
5.000 (5.054)	1.8766	1336.6 (1306.2)	341.0	0.08573 (0.08527)	2.1914	4360.1
4.000 (4.049)	2.0790	1286.2 (1259.0)	359.2	0.08497 (0.08462)	2.1363	4502.5
3.000 (3.038)	2.3838	1221.9 (1200.3)	380.8	0.08407 (0.08387)	2.0665	4677.7
2.000 (2.019)	2.9184	1133.6 (1121.0)	407.9	0.08293 (0.08296)	1.9705	4910.0
1.000 (1.003)	4.2248	988.3 (992.6)	447.4	0.08128 (0.08164)	1.8173	5269.4
0.800 (0.798)	4.7998	947.6 (952.0)	457.8	0.08085 (0.08125)	1.7708	5377.9
0.600 (0.597)	5.6713	893.5 (901.1)	470.9	0.08030 (0.08076)	1.7147	5510.0
0.500 (0.497)	6.3191	860.1 (869.2)	478.6	0.07997 (0.08045)	1.6812	5590.4
0.400 (0.397)	7.2330	820.4 (830.5)	487.7	0.07960 (0.08007)	1.6423	5685.8
0.300 (0.297)	8.6440	770.7 (781.1)	498.5	0.07914 (0.07959)	1.5961	5803.9
0.200 (0.202)	11.0782	693.6 (715.4)	514.5	0.07848 (0.07890)	1.5408	5955.9
0.100 (0.100)	17.6925	593.6 (600.8)	534.2	0.07765 (0.07773)	1.4637	6211.2
0.080 (0.080)	20.6767	563.6 (565.4)	539.9	0.07741 (0.07736)	1.4455	6288.8
0.060 (0.060)	25.2179	523.4 (522.7)	547.3	0.07710 (0.07691)	1.4273	6383.3
0.050 (0.050)	28.6379	499.1 (496.7)	551.6	0.07692 (0.07664)	1.4185	6441.4
0.040 (0.040)	33.4836	470.4 (466.3)	556.8	0.07671 (0.07634)	1.4106	6510.6
0.030 (0.030)	40.9952	435.3 (429.6)	562.9	0.07645 (0.07599)	1.4049	6596.7
0.020 (0.020)	54.9327	391.7 (382.0)	570.5	0.07613 (0.07562)	1.4054	6715.1
0.010 (0.010)	88.4600	317.5 (318.8)	583.0	0.07561 (0.07547)	1.4259	6893.8
0.008 (0.008)	104.8428	301.5 (300.6)	585.7	0.07549 (0.07560)	1.4386	6953.7
0.006 (0.006)	128.6365	277.7 (281.8)	589.7	0.07533 (0.07592)	1.4572	7023.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-25>> **********

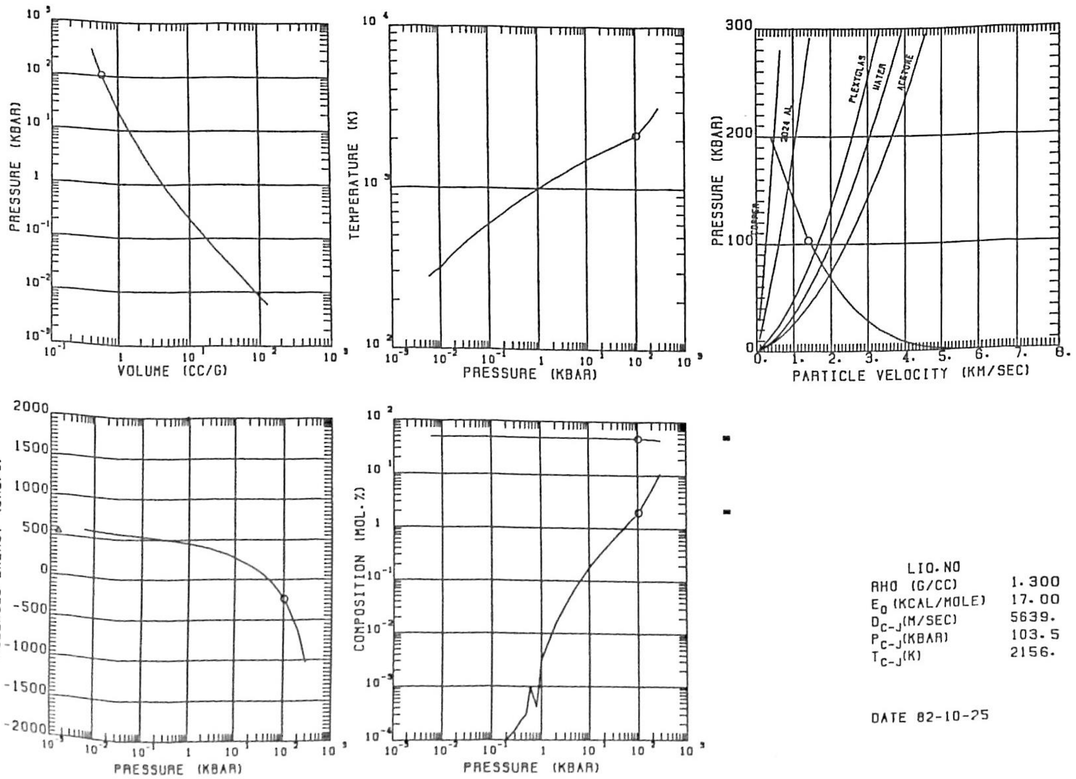
LIQ.NO RHO = 1.3000 G/CC EO = 1.700000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	N2	O2	NO
103.497	0.48991	0.48991	0.02019
100.000	0.48998	0.48998	0.02004
80.000	0.49212	0.49212	0.01576
60.000	0.49406	0.49406	0.01187
50.000	0.49505	0.49505	0.00989
40.000	0.49604	0.49604	0.00792
30.000	0.49705	0.49704	0.00591
20.000	0.49807	0.49807	0.00386
10.000	0.49909	0.49910	0.00179
8.000	0.49933	0.49933	0.00133
6.000	0.49953	0.49955	0.00091
5.000	0.49964	0.49966	0.00071
4.000	0.49974	0.49974	0.00051
3.000	0.49984	0.49983	0.00033
2.000	0.49992	0.49992	0.00016
1.000	0.49999	0.49997	0.00003
0.800	0.50000	0.50000	0.00000
0.600	0.50000	0.49998	0.00001
0.500	0.50000	0.49999	0.00000
0.400	0.50000	0.49999	0.00000
0.300	0.50000	0.49999	0.00000
0.200	0.50000	0.50000	0.00000
0.100	0.50000	0.50000	0.00000
0.080	0.50000	0.50000	0.00000
0.060	0.50000	0.50000	0.00000
0.050	0.50000	0.50000	0.00000
0.040	0.50000	0.50000	0.00000
0.030	0.50000	0.50000	0.00000
0.020	0.50001	0.50001	0.00000
0.010	0.50001	0.50001	0.00000
0.008	0.50001	0.50001	0.00000
0.006	0.50001	0.50001	0.00000
200.000	0.47233	0.47233	0.05535
300.000	0.44699	0.44699	0.10602

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



LIO.NO
RHO (G/CC) 1.300
E_0 (KCAL/MOLE) 17.00
D_{C-J}(M/SEC) 5639.
P_{C-J}(KBAR) 103.5
T_{C-J}(K) 2156.

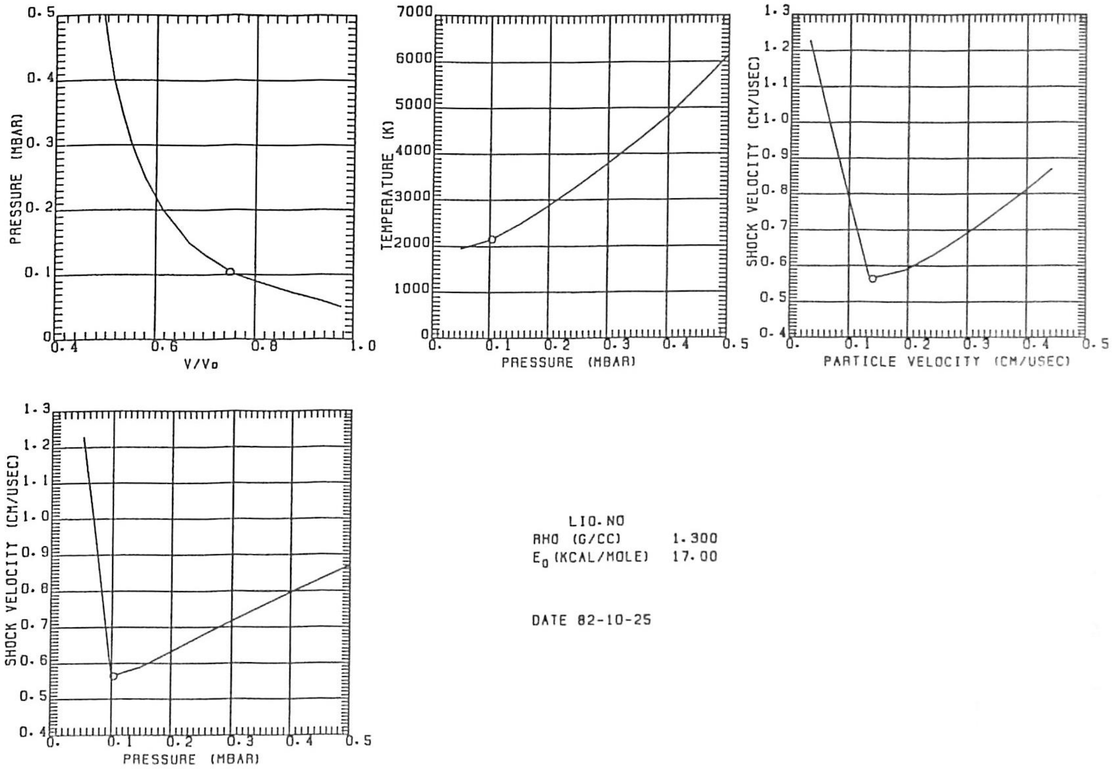
DATE 82-10-25

********** A K-H-T H U G O N I O T <<DATE 82-10-25>>**********

LIQ.NO RHO = 1.3000 G/CC, EO = 1.700000E+04 CAL/MOLE

PRESSURE	(KBAR)I	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)I	0.3784	0.3861	0.3955	0.4084	0.4243	0.4449	0.4727	0.5135	0.5833	0.7496
TEMP	(DEG K)I	6155.5	5475.2	4843.9	4308.6	3803.7	3329.6	2886.4	2479.5	2135.1	1948.7
US	(M/SEC)I	8700.5	8336.1	7958.4	7575.6	7173.9	6753.1	6317.2	5891.2	5640.9	12266.4
UP	(M/SEC)I	4420.6	4152.4	3866.2	3553.9	3216.8	2847.7	2435.3	1958.6	1363.6	313.5
N2	(MOLE)I	0.3665	0.3644	0.3696	0.3934	0.4181	0.4421	0.4634	0.4800	0.4904	0.4947
O2	(MOLE)I	0.3665	0.3644	0.3695	0.3934	0.4181	0.4421	0.4634	0.4800	0.4904	0.4947
NO	(MOLE)I	0.2670	0.2712	0.2609	0.2133	0.1639	0.1158	0.0731	0.0400	0.0192	0.0107

K-H-T HUGONIOT



LIO.NO
RHO (G/CC) 1.300
E_0 (KCAL/MOLE) 17.00

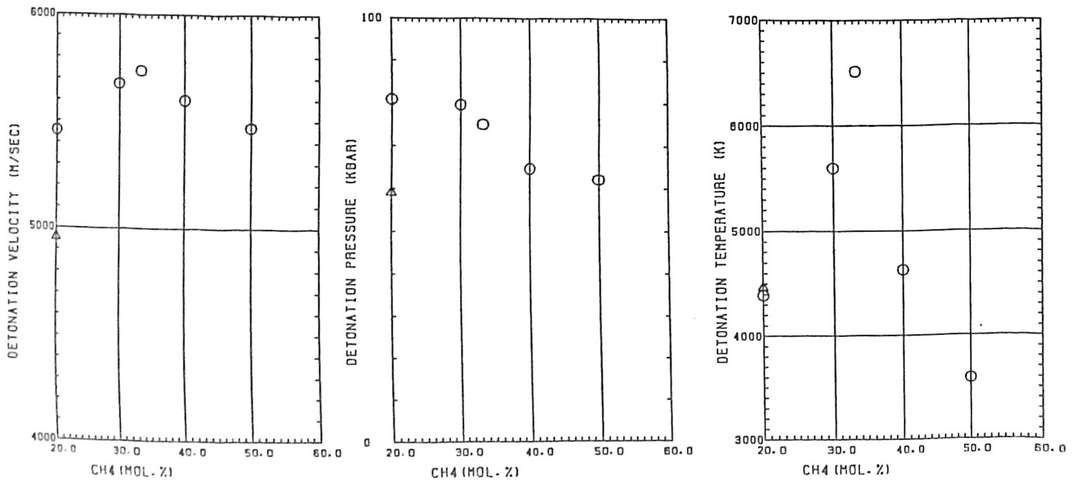
DATE 82-10-25

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES		LIQ. CH4/O2 0.5/0.5 MOLE	#LIQ. CH4/O2 0.4/0.6 MOLE	#LIQ. CH4/O2 STOICHIO.	#LIQ. CH4/O2 0.3/0.7 MOLE	#LIQ. CH4/O2 0.2/0.8 MOLE	#LIQ. CH4/O2 # 0.2/0.8 MOLE
RHO	(G/CC)	0.650	0.710	0.760	0.845	0.980	0.840
EO	(KCAL/MOLE)	-10.71	-8.85	7.61	0.01	0.01	0.01
MOL.WEIGHT	(G)	24.021	25.616	26.680	27.212	28.808	28.808
C		0.5000	0.4000	0.3333	0.3000	0.2000	0.2000
H		2.0000	1.6000	1.3333	1.2000	0.8000	0.8000
O		1.0000	1.2000	1.3333	1.4000	1.6000	1.6000
DETN.VEL	(M/SEC)	5471.2	5599.2	5736.5	5676.1	5456.1	4954.1
PARTICL.VEL(	")	1748.3	1629.2	1720.6	1660.7	1512.4	1419.2
C-J PRESS	(KBAR)	62.2	64.8	75.0	79.7	80.9	59.1
C-J VOLUME	(CC/G)	1.04685	0.99863	0.92114	0.83719	0.73755	0.84944
C-J TEMP	(DEG K)	3589.4	4629.4	6512.4	5598.6	4389.3	4463.4
C-J S	(CAL/DEG MOL)	50.13	54.34	62.58	60.95	57.12	57.61
C-J ENERGY	(CAL/G)	365.27	317.23	353.76	329.61	273.33	240.71
GAMMA		2.129	2.437	2.334	2.418	2.608	2.491
C-J DETN.HEAT	(CAL)	1570.1	1878.3	2598.8	2107.8	1389.7	1370.5
LAMDA		6.6162	7.3979	8.3038	8.4886	8.8214	8.7925
VOLUM(K LITTRE/KG)		1.3171	1.1530	0.9721	0.9347	0.8602	0.8635
TOTAL PRODCT	(MOLE)	1.4196	1.2073	1.0601	1.0396	1.0129	1.0167
V GAS	(MOLES)	1.2932	1.2073	1.0601	1.0396	1.0129	1.0167
V GAS	(CC/MOLE)	18.9914	21.1894	23.1830	21.9136	20.9769	24.0680
V SOL C(S)	(CC/G)	0.38604	0.39270	0.40075	0.38862	0.37780	0.39615
H2O	(MOL %)	43.6324	55.3196	58.8517	54.0255	37.5251	36.8953
CO2	(MOL %)	3.3065	9.9726	24.3508	25.0561	19.1921	18.8680
CO	(MOL %)	20.1430	23.1168	7.0926	3.8006	0.5546	0.8037
H2	(MOL %)	21.0072	10.1908	1.5412	0.6643	0.0817	0.1292
O2	(MOL %)	0.0001	0.0202	3.1762	10.4051	38.8730	38.6641
OH	(MOL %)	0.0523	0.9756	4.7814	5.9204	3.7541	4.6065
H	(MOL %)	0.0878	0.3617	0.2062	0.1280	0.0193	0.0333
CH4	(MOL %)	2.8655	0.0429	0.0001	0.0001	0.0001	0.0001
C(S)	(MOL %)	8.9053	0.0	0.0	0.0	0.0	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



○ CH4/O2
△ CH4/O2 10.84G/CC)

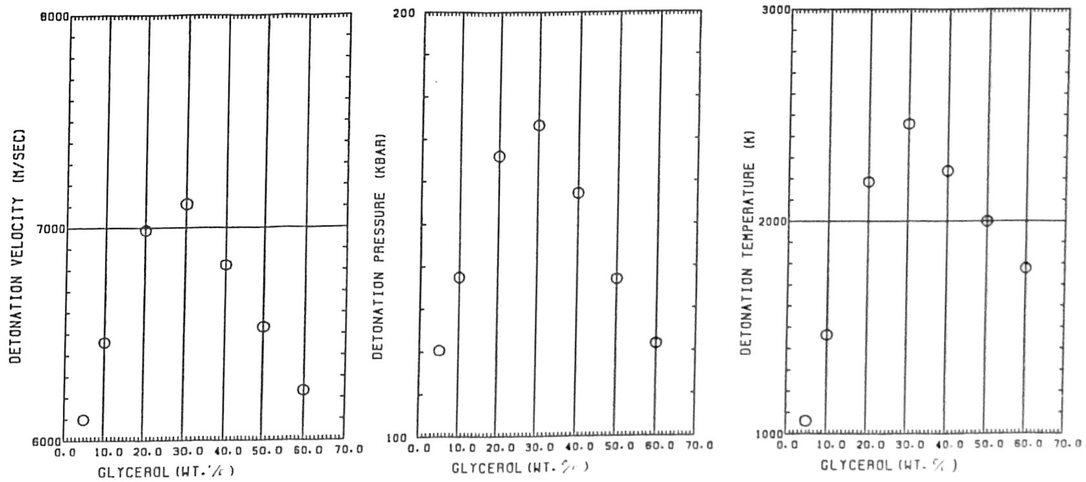
DATE 82-10-28

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES		GLYCEROL H2O2(90%)	5 #GLYCEROL 95 H2O2(90%)	10 #GLYCEROL 90 H2O2(90%)	20 #GLYCEROL 80 H2O2(90%)	30 #GLYCEROL 70 H2O2(90%)	40 #GLYCEROL 60 H2O2(90%)	50 #GLYCEROL 50 H2O2(90%)	60 # 40
RHO	(G/CC)	1.392	1.385	1.371	1.357	1.343	1.329	1.316	
EO	(KCAL/MOLE)	-157.49	-158.33	-160.01	-161.69	-163.38	-165.06	-166.74	
MOL.WEIGHT	(G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
C		0.1629	0.3257	0.6515	0.9772	1.3030	1.6287	1.9545	
H		6.5162	6.6305	6.8589	7.0874	7.3159	7.5443	7.7728	
O		5.7174	5.5880	5.3290	5.0701	4.8111	4.5522	4.2933	
DETN.VEL	(M/SEC)	6099.4	6461.8	6987.2	7111.0	6823.7	6531.2	6233.4	
PARTICL.VEL(	")	1417.2	1535.9	1733.5	1795.8	1715.2	1576.4	1483.3	
C-J PRESS	(KBAR)	120.3	137.5	166.1	173.3	157.2	136.8	121.7	
C-J VOLUME	(CC/G)	0.55147	0.55040	0.54844	0.55082	0.55744	0.57083	0.57906	
C-J TEMP	(DEG K)	1059.8	1465.1	2184.7	2458.6	2236.3	1998.2	1775.6	
C-J S	(CAL/DEG MOL)	38.68	41.96	46.69	48.50	48.12	47.44	46.52	
C-J ENERGY	(CAL/G)	240.01	281.91	359.09	385.37	351.57	296.96	262.94	
GAMMA		3.304	3.207	3.031	2.960	2.978	3.143	3.202	
C-J DETN.HEAT	(CAL)	461.6	639.3	994.5	1143.7	1019.6	894.8	769.4	
LAMDA		7.1236	7.2426	7.4862	7.4949	7.1736	6.8397	6.4931	
VOLUM(K LITTRE/KG)		1.0980	1.0891	1.0714	1.0571	1.0380	1.0194	1.0012	
TOTAL PRODCT	(MOLE)	4.4879	4.4517	4.3794	4.5210	4.9609	5.4009	5.8409	
V GAS	(MOLES)	4.4879	4.4517	4.3794	4.3207	4.2428	4.1669	4.0922	
V GAS	(CC/MOLE)	12.2880	12.3640	12.5230	12.5755	12.4929	12.5354	12.4337	
V SOL C(S)	(CC/G)	0.33154	0.32415	0.31281	0.31051	0.31762	0.32723	0.33447	
H2O	(MOL %)	72.6023	74.4742	78.3017	78.2735	73.6546	69.7812	66.4926	
CO2	(MOL %)	3.6315	7.3189	14.8768	16.6840	11.5370	7.1967	3.4876	
CO	(MOL %)	0.0000	0.0000	0.0001	0.5027	0.2517	0.1124	0.0362	
H2	(MOL %)	0.0000	0.0000	0.0000	0.1089	0.0797	0.0617	0.0451	
O2	(MOL %)	23.7662	18.2067	6.8058	0.0000	0.0000	0.0000	0.0000	
OH	(MOL %)	0.0000	0.0002	0.0156	0.0017	0.0004	0.0001	0.0000	
H	(MOL %)	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	
CH4	(MOL %)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	
C(S)	(MOL %)	0.0	0.0	0.0	4.4291	14.4764	22.8477	29.9385	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



○ GLYCEROL/H2O2

DATE 82-10-28

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES	BTF	# BTF	# TNM	# HNB	# HNB	# HNB	# HNB	#
RHO (G/CC)	1.859	1.760	1.640	1.973	1.900	1.800	1.700	
EO (KCAL/MOLE)	144.00	144.00	8.80	10.00	10.00	10.00	10.00	
MOL.WEIGHT (G)	252.103	252.103	196.033	348.100	348.100	348.100	348.100	
C	6.0000	6.0000	1.0000	6.0000	6.0000	6.0000	6.0000	
N	6.0000	6.0000	4.0000	6.0000	6.0000	6.0000	6.0000	
O	6.0000	6.0000	8.0000	12.0000	12.0000	12.0000	12.0000	
DETN.VEL (M/SEC)	8193.7	7941.8	6226.0	8625.8	8384.4	8051.0	7721.1	
PARTICL.VEL(")	2152.2	2056.6	1500.4	2067.7	1997.9	1987.4	1905.9	
C-J PRESS (KBAR)	327.8	287.5	153.2	351.9	318.3	288.0	250.2	
C-J VOLUME (CC/G)	0.39663	0.42105	0.46281	0.38535	0.40090	0.41842	0.44304	
C-J TEMP (DEG K)	4916.9	4952.0	1644.8	4543.6	4614.7	4744.9	4825.4	
C-J S(CAL/DEG MOL)	63.31	62.80	44.40	59.07	59.39	59.82	60.15	
C-J ENERGY (CAL/G)	553.55	505.43	269.03	510.90	476.99	472.01	434.06	
GAMMA	2.807	2.862	3.150	3.172	3.197	3.051	3.051	
C-J DETN.HEAT(CAL)	1619.4	1602.1	521.8	1592.0	1580.0	1560.7	1540.0	
LAMDA	11.5801	11.4688	10.1985	12.4374	12.4031	12.3482	12.2888	
VOLUM(K LITTRE/KG)	0.6091	0.6212	0.7488	0.6410	0.6428	0.6458	0.6490	
TOTAL PRODCT(MOLE)	9.0490	9.0433	6.0000	9.1204	9.1465	9.1885	9.2346	
V GAS (MOLES)	6.2765	6.4008	6.0000	9.1204	9.1465	9.1885	9.2346	
V GAS (CC/MOLE)	14.5952	15.2495	15.1210	14.7077	15.2577	15.8514	16.7003	
V SOL C(S) (CC/G)	0.25179	0.26909	0.31674	0.24027	0.25452	0.26794	0.28505	
CO2 (MOL %)	29.5555	28.2630	16.6668	63.1473	62.3958	61.1956	59.8913	
CO (MOL %)	6.1117	8.8633	0.0000	2.6395	3.2032	4.1033	5.0815	
N2 (MOL %)	32.6732	32.7454	33.1170	31.9199	31.6650	31.2611	30.8592	
O2 (MOL %)	0.0619	0.0507	49.7836	0.3462	0.4671	0.6633	0.9136	
NO (MOL %)	0.9592	0.8566	0.4326	1.9471	2.2690	2.7767	3.2544	
C(S) (MOL %)	30.6385	29.2210	0.0	0.0	0.0	0.0	0.0	

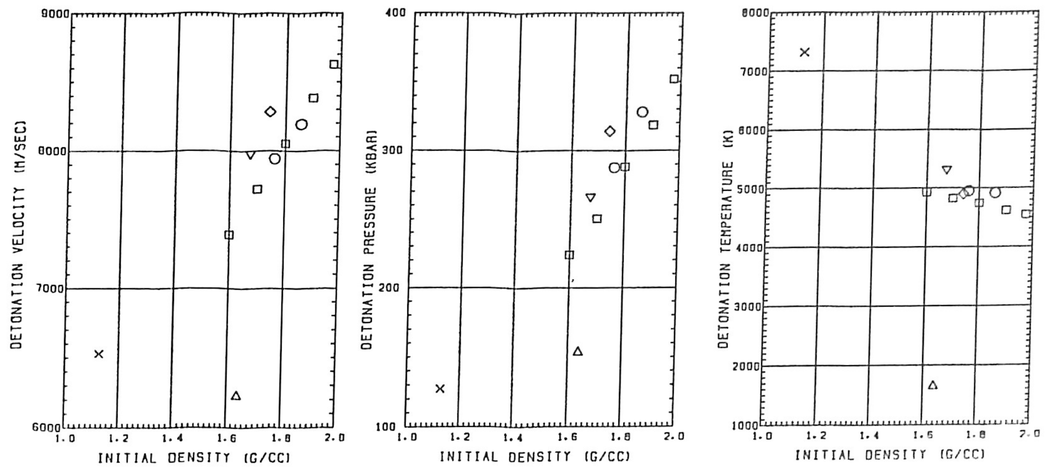
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES	HNB	# TNTAB	#BTF/TNM 1/1 MOLE	#CYANOGEN/TNM# 3/1 MOLE
RHO (G/CC)	1.600	1.740	1.673	1.128
EO (KCAL/MOLE)	10.00	270.00	152.80	230.50
MOL.WEIGHT (G)	348.100	336.144	448.136	274.087
C	6.0000	6.0000	7.0000	4.0000
N	6.0000	12.0000	10.0000	7.0000
O	12.0000	6.0000	14.0000	8.0000
DETN.VEL (M/SEC)	7389.6	8282.4	7981.9	6529.6
PARTICL.VEL(")	1892.3	2178.6	1994.6	1725.1
C-J PRESS (KBAR)	223.7	314.0	266.4	127.1
C-J VOLUME (CC/G)	0.46495	0.42354	0.44836	0.65231
C-J TEMP (DEG K)	4931.9	4901.1	5325.9	7320.9
C-J S(CAL/DEG MOL)	60.46	57.85	59.66	62.67
C-J ENERGY (CAL/G)	427.91	567.17	475.43	355.61
GAMMA	2.905	2.802	3.002	2.785
C-J DETN.HEAT(CAL)	1516.1	1571.3	1678.9	1998.0
LAMDA	12.2209	10.9401	11.9054	11.4913
VOLUM(K LITTRE/KG)	0.6528	0.6821	0.6746	0.7026
TOTAL PRODCT(MOLE)	9.2880	12.0644	12.3571	7.8716
V GAS (MOLES)	9.2880	9.3724	12.3571	7.8716
V GAS (CC/MOLE)	17.4258	14.3021	16.2601	22.7134
V SOL C(S) (CC/G)	0.29788	0.25754	0.28003	0.36599
CO2 (MOL %)	58.3987	21.2459	50.8676	41.3754
CO (MOL %)	6.2010	6.1740	5.7800	9.4404
N2 (MOL %)	30.4040	49.2432	38.5044	41.8717
O2 (MOL %)	1.2046	0.0437	0.9319	2.1281
NO (MOL %)	3.7917	0.9799	3.9162	5.1845
C(S) (MOL %)	0.0	22.3132	0.0	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-28

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

HNB RHO = 1.9730 G/CC EO = 1.000000E+04 CAL/MOLE

LN P = -3.59678745 E+00 -2.30661583 E+00LN V 3.54581535 E-01LN V*2 -4.86419126 E-02LN V*3 2.41098646 E-03LN V*4

LN T = 8.13232231 E+00 -2.55309165 E-01LN V 5.68752214 E-02LN V*2 -1.32740811 E-02LN V*3 9.29932809 E-04LN V*4

LN E = -1.71868610 E+00 4.25459266 E-01LNP 6.45633936 E-02LN P*2 5.20971045 E-03LN P*3 1.56191629 E-04LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (608.255)	0.3263	5256.1 (4962.3)	-1182.0	0.14946 (0.14663)	3.2972	857.8
500.000 (507.575)	0.3449	4962.7 (4845.1)	-922.4	0.13859 (0.13748)	3.2384	1293.9
400.000 (405.811)	0.3699	4687.7 (4705.4)	-649.7	0.12718 (0.12768)	3.1657	1795.0
* 351.888 (356.615)	0.3854	4543.6 (4627.2)	-509.9	0.12134 (0.12266)	3.1238	2067.7
300.000 (301.460)	0.4069	4440.6 (4528.4)	-376.9	0.11577 (0.11694)	3.0693	2411.7
200.000 (197.122)	0.4688	4199.8 (4291.8)	-89.0	0.10372 (0.10468)	2.9318	3212.2
100.000 (97.066)	0.6029	3861.2 (3935.7)	267.6	0.08880 (0.08935)	2.7041	4357.6
80.000 (77.680)	0.6554	3768.2 (3832.9)	355.4	0.08513 (0.08552)	2.6330	4676.2
60.000 (58.459)	0.7315	3657.0 (3707.5)	454.4	0.08099 (0.08120)	2.5429	5058.0
50.000 (48.901)	0.7853	3590.7 (3632.0)	509.9	0.07867 (0.07876)	2.4867	5284.6
40.000 (39.352)	0.8581	3513.4 (3543.2)	571.4	0.07609 (0.07606)	2.4186	5547.9
30.000 (29.783)	0.9649	3418.8 (3434.2)	641.8	0.07315 (0.07297)	2.3322	5866.9
20.000 (20.124)	1.1466	3292.0 (3289.3)	727.5	0.06956 (0.06923)	2.2123	6284.3
10.000 (10.225)	1.5805	3084.7 (3059.9)	847.6	0.06454 (0.06410)	2.0116	6931.6
8.000 (8.192)	1.7678	3019.4 (2989.8)	881.0	0.06314 (0.06270)	1.9482	7126.5
6.000 (6.139)	2.0565	2934.6 (2901.8)	921.6	0.06144 (0.06105)	1.8675	7369.4
5.000 (5.105)	2.2730	2881.3 (2847.3)	945.9	0.06042 (0.06007)	1.8174	7518.8
4.000 (4.070)	2.5802	2816.0 (2781.8)	974.3	0.05923 (0.05894)	1.7573	7696.8
3.000 (3.037)	3.0593	2732.3 (2699.6)	1009.1	0.05778 (0.05756)	1.6826	7918.7
2.000 (2.011)	3.9388	2615.5 (2587.1)	1054.9	0.05586 (0.05576)	1.5838	8217.5
1.000 (0.997)	6.2746	2416.9 (2401.0)	1126.4	0.05287 (0.05295)	1.4367	8696.1
0.800 (0.796)	7.3571	2353.0 (2341.6)	1147.9	0.05197 (0.05209)	1.3959	8843.4
0.600 (0.595)	9.0899	2269.6 (2264.8)	1175.0	0.05084 (0.05101)	1.3486	9029.2
0.500 (0.495)	10.4306	2216.4 (2215.8)	1191.8	0.05013 (0.05034)	1.3218	9144.8
0.400 (0.396)	12.3866	2151.1 (2155.4)	1211.9	0.04929 (0.04953)	1.2924	9284.1
0.300 (0.297)	15.5347	2066.9 (2076.9)	1237.2	0.04824 (0.04851)	1.2603	9460.4
0.200 (0.198)	21.5311	1949.0 (1964.9)	1271.5	0.04680 (0.04709)	1.2258	9702.4
0.100 (0.099)	38.0361	1751.7 (1772.1)	1326.5	0.04450 (0.04474)	1.1937	10098.2
0.080 (0.080)	45.8099	1692.7 (1709.9)	1342.5	0.04383 (0.04401)	1.1894	10221.9
0.060 (0.060)	58.1425	1615.3 (1631.1)	1363.3	0.04296 (0.04309)	1.1874	10377.2
0.050 (0.050)	67.7229	1569.8 (1581.4)	1375.4	0.04245 (0.04252)	1.1879	10474.7
0.040 (0.040)	81.4904	1512.6 (1522.0)	1390.4	0.04182 (0.04184)	1.1899	10591.2
0.030 (0.030)	103.5481	1442.8 (1446.9)	1408.6	0.04106 (0.04100)	1.1944	10739.2
0.020 (0.020)	145.0968	1348.8 (1345.5)	1432.8	0.04005 (0.03987)	1.2028	10942.4
0.010 (0.010)	257.8137	1199.0 (1187.8)	1470.7	0.03847 (0.03819)	1.2170	11274.4
0.008 (0.008)	310.3574	1154.8 (1141.8)	1481.7	0.03801 (0.03772)	1.2200	11377.6
0.006 (0.006)	393.7234	1098.8 (1086.7)	1495.4	0.03743 (0.03719)	1.2218	11507.1
0.005 (0.005)	458.0850	1065.4 (1054.2)	1503.6	0.03709 (0.03689)	1.2215	11587.8
0.004 (0.004)	550.1868	1023.7 (1017.5)	1513.7	0.03667 (0.03657)	1.2190	11683.5
0.003 (0.003)	697.2200	973.0 (974.7)	1525.8	0.03616 (0.03625)	1.2122	11804.3
0.002 (0.002)	973.4475	905.7 (923.8)	1541.7	0.03550 (0.03598)	1.1942	11968.6

; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

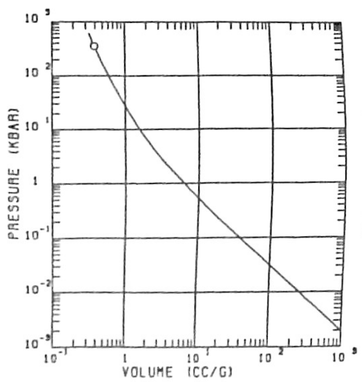
HNB RHO = 1.9730 G/CC EO = 1.000000E+04 CAL/MOLE

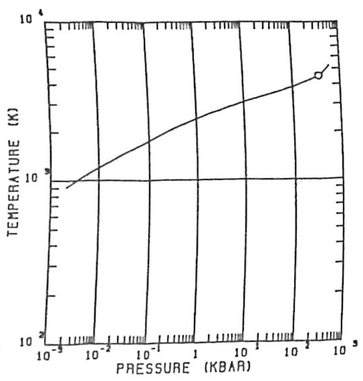
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

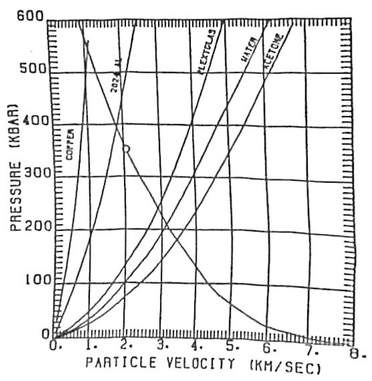
PRESS	CO2	CO	N2	O2	NO	C(S)
351.888	5.75886	0.24114	2.91111	0.03168	0.17779	0.0
300.000	5.74891	0.25109	2.91154	0.03709	0.17692	0.0
200.000	5.72990	0.27010	2.91559	0.05064	0.16881	0.0
100.000	5.71630	0.28369	2.92739	0.06924	0.14522	0.0
80.000	5.71664	0.28336	2.93166	0.07334	0.13668	0.0
60.000	5.72009	0.27991	2.93721	0.07717	0.12558	0.0
50.000	5.72400	0.27599	2.94071	0.07871	0.11858	0.0
40.000	5.73041	0.26959	2.94492	0.07972	0.11016	0.0
30.000	5.74113	0.25886	2.95021	0.07964	0.09958	0.0
20.000	5.76042	0.23958	2.95737	0.07716	0.08527	0.0
10.000	5.80204	0.19796	2.96866	0.06764	0.06268	0.0
8.000	5.81677	0.18322	2.97197	0.06359	0.05605	0.0
6.000	5.83654	0.16346	2.97604	0.05777	0.04792	0.0
5.000	5.84901	0.15099	2.97844	0.05393	0.04312	0.0
4.000	5.86417	0.13583	2.98120	0.04911	0.03760	0.0
3.000	5.88302	0.11698	2.98443	0.04292	0.03114	0.0
2.000	5.90766	0.09234	2.98835	0.03452	0.02330	0.0
1.000	5.94323	0.05678	2.99344	0.02183	0.01312	0.0
0.800	5.95267	0.04733	2.99468	0.01835	0.01063	0.0
0.600	5.96348	0.03652	2.99604	0.01430	0.00791	0.0
0.500	5.96947	0.03053	2.99677	0.01203	0.00647	0.0
0.400	5.97588	0.02413	2.99752	0.00958	0.00497	0.0
0.300	5.98269	0.01731	2.99828	0.00694	0.00344	0.0
0.200	5.98976	0.01025	2.99903	0.00415	0.00193	0.0
0.100	5.99649	0.00352	2.99969	0.00145	0.00061	0.0
0.080	5.99758	0.00242	2.99979	0.00100	0.00041	0.0
0.060	5.99859	0.00141	2.99988	0.00059	0.00023	0.0
0.050	5.99900	0.00100	2.99992	0.00042	0.00016	0.0
0.040	5.99938	0.00063	2.99995	0.00026	0.00010	0.0
0.030	5.99967	0.00034	2.99997	0.00014	0.00005	0.0
0.020	5.99987	0.00013	2.99999	0.00005	0.00002	0.0
0.010	5.99998	0.00002	3.00000	0.00001	0.00000	0.0
0.008	5.99999	0.00001	3.00000	0.00000	0.00000	0.0
0.006	6.00000	0.00001	3.00000	0.00000	0.00000	0.0
0.005	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.004	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.003	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.002	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
400.000	5.75152	0.24848	2.90551	0.02975	0.18898	0.0
500.000	5.73939	0.26061	2.89580	0.02611	0.20840	0.0
600.000	5.77031	0.22969	2.90488	0.01972	0.19024	0.0

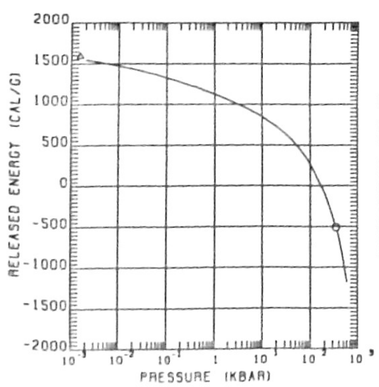
PRESS ;KBAR, PRODUCTS ;MOLES

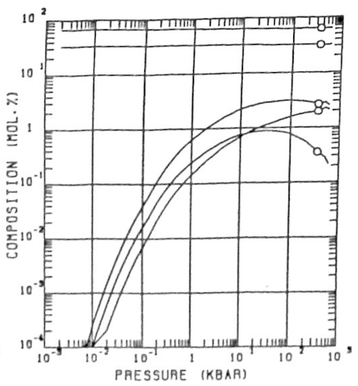
K-H-T ISENTROPE THRU C-J POINT











HNB

RHO (G/CC)	1.973
E_0 (KCAL/MOLE)	10.00
D_{C-J} (M/SEC)	8626.
P_{C-J} (KBAR)	351.9
T_{C-J} (K)	4544.

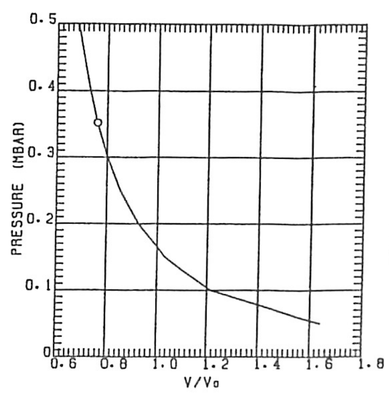
DATE 82-10-28

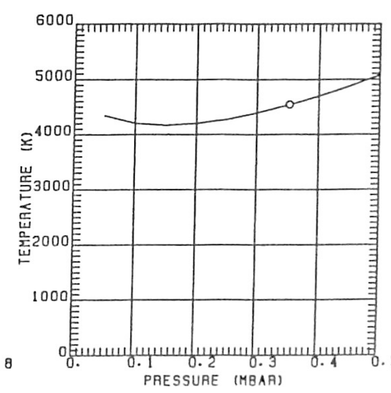
********** A K-H-T H U G O N I O T <<DATE 82-10-28>>**********

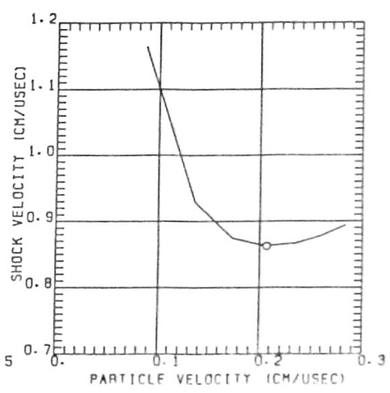
HNB RHO = 1.9730 G/CC, EO = 1.000000E+04 CAL/MOLE

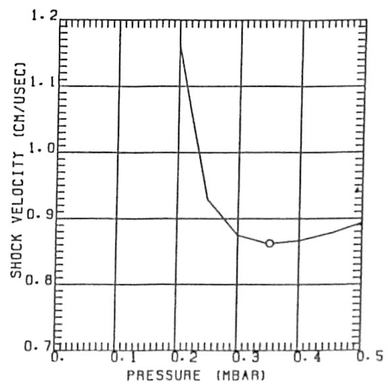
PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3460	0.3570	0.3700	0.3860	0.4062	0.4325	0.4689	0.5231	0.6155	0.8306
TEMP	(DEG K)	5076.6	4876.2	4697.8	4537.5	4397.4	4283.3	4204.4	4172.5	4208.7	4346.1
US	(M/SEC)	8936.5	8782.9	8665.1	8625.7	8749.0	9296.1	11640.3	0.0	0.0	0.0
UP	(M/SEC)	2835.8	2596.8	2339.7	2056.6	1737.9	1363.0	870.8	0.0	0.0	0.0
CO2	(MOLE)	5.7232	5.7306	5.7488	5.7598	5.7629	5.7547	5.7281	5.6689	5.5382	5.2170
CO	(MOLE)	0.2768	0.2694	0.2512	0.2402	0.2371	0.2453	0.2719	0.3311	0.4618	0.7830
N2	(MOLE)	2.8902	2.8952	2.9045	2.9115	2.9161	2.9177	2.9151	2.9059	2.8846	2.8370
O2	(MOLE)	0.0286	0.0299	0.0301	0.0316	0.0347	0.0404	0.0510	0.0715	0.1155	0.2284
NO	(MOLE)	0.2195	0.2097	0.1910	0.1770	0.1678	0.1645	0.1698	0.1882	0.2307	0.3261
C(S)	(MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

K-H-T HUGONIOT









HNB

RHO (G/CC)	1.973
E_0 (KCAL/MOLE)	10.00

DATE 82-10-28

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

TNM RHO = 1.6400 G/CC EO = 8.800398E+03 CAL/MOLE

LN P = -4.11482525 E+00 -2.66758633 E+00LN V 3.39126885 E-01LN V*2 -2.67219879 E-02LN V*3 -9.76304989 E-04LN V*4

LN T = 7.01076603 E+00 -4.43194568 E-01LN V 1.21568918 E-01LN V*2 -5.35969734 E-02LN V*3 7.39399716 E-03LN V*4

LN E = -1.65393066 E+00 4.05899942 E-01LNP 7.69723654 E-02LN P*2 6.78917021 E-03LN P*3 2.24806674 E-04LN P*4

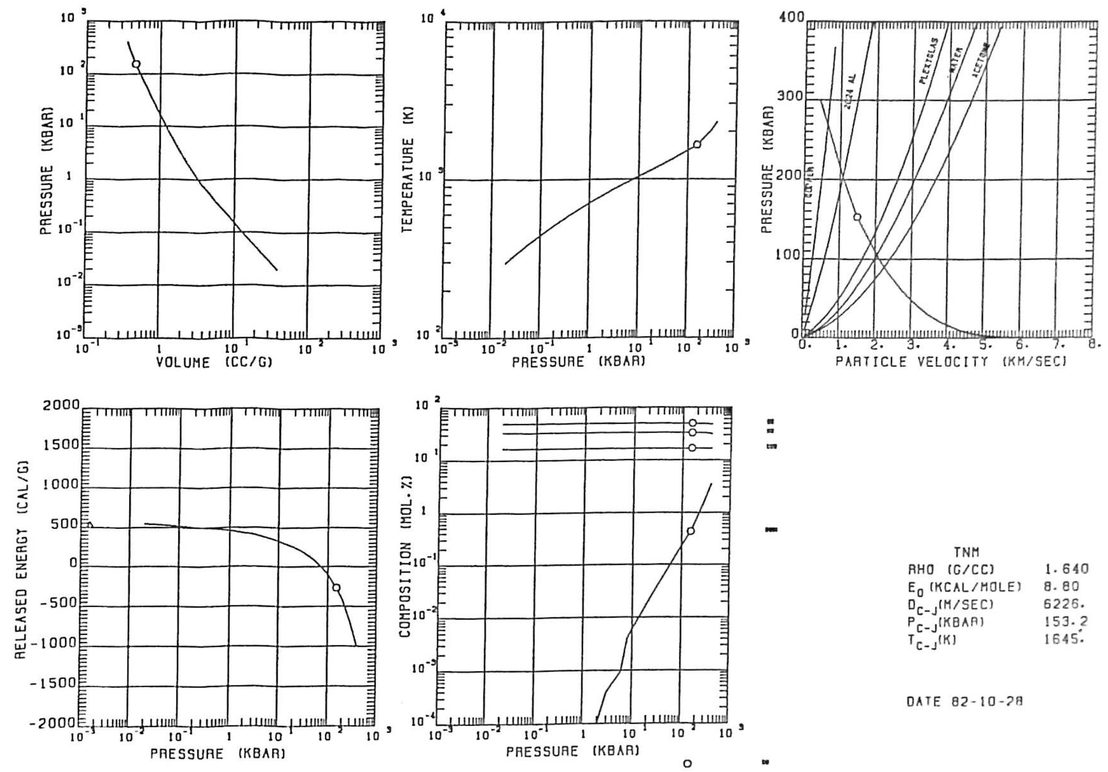
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (388.104)	0.3536	2288.7 (2146.7)	-990.8	0.14146 (0.13997)	3.4549	0.0
300.000 (298.600)	0.3818	2025.3 (2007.1)	-707.9	0.12962 (0.12971)	3.3915	409.7
200.000 (204.108)	0.4278	1779.7 (1828.9)	-417.0	0.11745 (0.11829)	3.2990	1095.4
* 153.202 (157.861)	0.4628	1644.8 (1722.6)	-269.6	0.11128 (0.11230)	3.2360	1500.4
100.000 (101.732)	0.5313	1522.9 (1563.1)	-100.5	0.10420 (0.10466)	3.1276	2118.2
80.000 (80.720)	0.5725	1462.6 (1488.9)	-29.3	0.10122 (0.10144)	3.0702	2412.0
60.000 (59.942)	0.6315	1389.1 (1402.1)	49.4	0.09793 (0.09791)	2.9959	2761.6
50.000 (49.693)	0.6726	1345.4 (1351.8)	92.4	0.09613 (0.09599)	2.9489	2966.7
40.000 (39.544)	0.7273	1295.3 (1294.6)	138.9	0.09419 (0.09393)	2.8915	3202.2
30.000 (29.524)	0.8057	1235.0 (1227.5)	190.5	0.09203 (0.09167)	2.8178	3481.9
20.000 (19.647)	0.9336	1157.1 (1143.5)	250.0	0.08954 (0.08913)	2.7146	3835.9
10.000 (9.897)	1.2121	1038.0 (1022.1)	325.7	0.08637 (0.08606)	2.5401	4351.6
8.000 (7.946)	1.3227	1004.0 (987.5)	344.5	0.08558 (0.08532)	2.4842	4498.3
6.000 (5.993)	1.4843	960.6 (945.4)	366.2	0.08468 (0.08450)	2.4125	4675.6
5.000 (5.013)	1.5995	933.4 (919.9)	378.6	0.08416 (0.08405)	2.3671	4781.8
4.000 (4.026)	1.7567	901.2 (889.6)	392.4	0.08358 (0.08355)	2.3116	4906.2
3.000 (3.031)	1.9899	860.4 (852.0)	408.5	0.08291 (0.08297)	2.2401	5058.2
2.000 (2.026)	2.3920	803.9 (800.7)	428.3	0.08208 (0.08226)	2.1396	5258.4
1.000 (1.010)	3.3580	709.2 (715.5)	456.6	0.08090 (0.08120)	1.9706	5567.7
0.800 (0.804)	3.7764	681.5 (688.0)	464.1	0.08058 (0.08088)	1.9171	5660.4
0.600 (0.600)	4.4101	645.1 (653.0)	473.4	0.08019 (0.08047)	1.8504	5773.7
0.500 (0.499)	4.8786	622.5 (630.8)	478.9	0.07996 (0.08021)	1.8096	5842.5
0.400 (0.398)	5.5361	595.6 (603.7)	485.2	0.07970 (0.07989)	1.7612	5923.8
0.300 (0.298)	6.5445	561.9 (569.0)	492.8	0.07938 (0.07949)	1.7022	6024.0
0.200 (0.199)	8.3507	516.2 (520.8)	502.5	0.07897 (0.07894)	1.6265	6157.3
0.100 (0.100)	12.9399	443.0 (441.9)	517.1	0.07837 (0.07812)	1.5221	6367.1
0.080 (0.080)	14.9946	421.2 (418.0)	521.2	0.07819 (0.07790)	1.4964	6430.9
0.060 (0.060)	18.1753	393.4 (389.0)	526.2	0.07798 (0.07768)	1.4701	6510.2
0.050 (0.050)	20.5719	376.4 (371.8)	529.3	0.07785 (0.07759)	1.4576	6559.0
0.040 (0.040)	23.9780	356.1 (352.2)	532.8	0.07771 (0.07752)	1.4471	6617.2
0.030 (0.030)	29.2766	331.1 (329.7)	537.1	0.07753 (0.07755)	1.4417	6690.0
0.020 (0.020)	38.9306	298.0 (303.6)	542.7	0.07729 (0.07783)	1.4506	6788.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

K-H-T ISENTROPE THRU C-J POINT



TNM	
RHO (G/CC)	1.640
E_0 (KCAL/MOLE)	8.80
D_{C-J} (M/SEC)	6226.
P_{C-J} (KBAR)	153.2
T_{C-J} (K)	1645.

DATE 82-10-28

********** A K-H-T H U G O N I O T <<DATE 82-10-28>>**********

TNM RHO = 1.6400 G/CC, EO = 8.800398E+03 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3402	0.3490	0.3591	0.3710	0.3857	0.4043	0.4290	0.4658	0.5302	0.6881
TEMP (DEG K)	3670.1	3325.7	2989.5	2668.2	2366.7	2089.2	1838.1	1634.1	1501.6	1533.2
US (M/SEC)	8304.7	8010.0	7702.3	7383.2	7055.2	6725.4	6414.4	6223.7	6837.1	0.0
UP (M/SEC)	3671.1	3425.6	3166.6	2890.5	2592.8	2266.6	1901.2	1469.6	891.8	0.0
CO2 (MOLE)	0.9998	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CO (MOLE)	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2 (MOLE)	1.5722	1.6656	1.7551	1.8344	1.8983	1.9441	1.9728	1.9876	1.9938	1.9939
O2 (MOLE)	2.5723	2.6657	2.7551	2.8344	2.8983	2.9441	2.9728	2.9876	2.9938	2.9939
NO (MOLE)	0.8556	0.6687	0.4898	0.3312	0.2034	0.1118	0.0543	0.0247	0.0125	0.0122
C(S) (MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

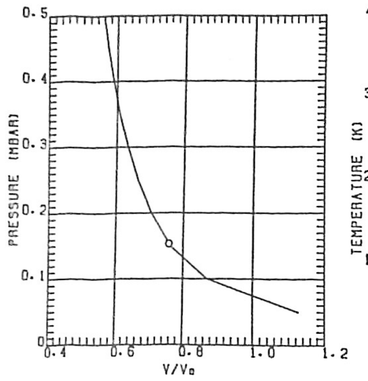
TNM RHO = 1.6400 G/CC EO = 8.800398E+03 CAL/MOLE

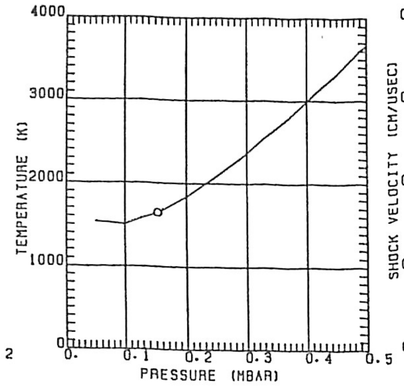
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

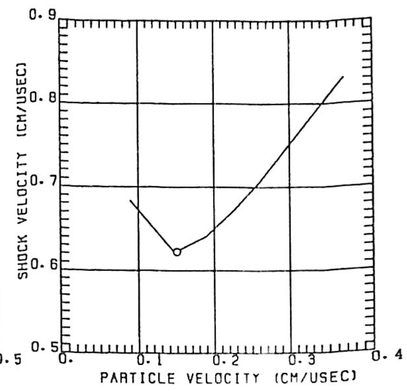
PRESS	CO2	CO	N2	O2	NO	C(S)
153.202	1.00001	0.00000	1.98701	2.98701	0.02597	0.0
100.000	1.00001	0.00000	1.99314	2.99314	0.01371	0.0
80.000	1.00001	0.00000	1.99513	2.99512	0.00974	0.0
60.000	1.00001	0.00000	1.99689	2.99688	0.00623	0.0
50.000	1.00001	0.00000	1.99766	2.99765	0.00468	0.0
40.000	1.00001	0.00000	1.99834	2.99834	0.00331	0.0
30.000	1.00001	0.00000	1.99894	2.99894	0.00211	0.0
20.000	1.00001	0.00000	1.99944	2.99944	0.00112	0.0
10.000	1.00001	0.00000	1.99982	2.99981	0.00036	0.0
8.000	1.00002	0.00000	1.99988	2.99987	0.00025	0.0
6.000	1.00002	0.00000	1.99997	2.99996	0.00006	0.0
5.000	1.00002	0.00000	1.99998	2.99997	0.00004	0.0
4.000	1.00002	0.00000	1.99998	2.99997	0.00003	0.0
3.000	1.00002	0.00000	1.99999	2.99998	0.00002	0.0
2.000	1.00002	0.00000	2.00000	2.99999	0.00000	0.0
1.000	1.00003	0.00000	2.00000	2.99998	0.00000	0.0
0.800	1.00003	0.00000	2.00000	2.99998	0.00000	0.0
0.600	1.00003	0.00000	2.00000	2.99998	0.00000	0.0
0.500	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.400	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.300	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.200	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.100	1.00006	0.00000	2.00000	2.99998	0.00000	0.0
0.080	1.00006	0.00000	2.00000	2.99997	0.00000	0.0
0.060	1.00007	0.00000	2.00000	2.99997	0.00000	0.0
0.050	1.00007	0.00000	2.00001	2.99997	0.00000	0.0
0.040	1.00007	0.00000	2.00001	2.99997	0.00000	0.0
0.030	1.00008	0.00000	2.00001	2.99997	0.00000	0.0
0.020	1.00009	0.00000	2.00001	2.99996	0.00000	0.0
200.000	1.00000	0.00000	1.97717	2.97717	0.04566	0.0
300.000	1.00000	0.00000	1.94692	2.94692	0.10616	0.0
400.000	1.00000	0.00000	1.89660	2.89660	0.20680	0.0

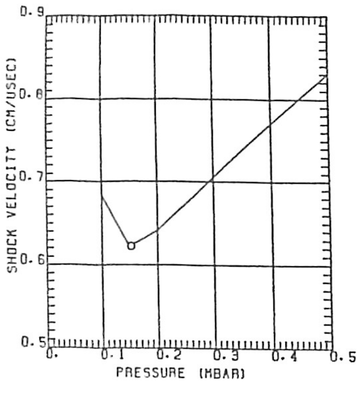
PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T HUGONIOT









TNM
RHO (G/CC) 1.640
E_0 (KCAL/MOLE) 8.80

DATE 82-10-28

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	AMMONIUM NITRATE	#AMMONIUM NITRATE	#AMMONIUM NITRATE	#AMMONIUM NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#
RHO (G/CC)	1.050	0.900	0.800	0.700	1.626	1.500	1.300	
EO (KCAL/MOLE)	-87.28	-87.28	-87.28	-87.28	-59.03	-59.03	-59.03	
MOL.WEIGHT (G)	80.043	80.043	80.043	80.043	95.058	95.058	95.058	
N	2.0000	2.0000	2.0000	2.0000	3.0000	3.0000	3.0000	
H	4.0000	4.0000	4.0000	4.0000	5.0000	5.0000	5.0000	
O	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
DETN.VEL (M/SEC)	4882.5	4399.4	4066.5	3724.9	8201.0	7693.5	6936.2	
PARTICL.VEL(")	1198.1	1115.3	1060.6	988.2	1827.9	1820.1	1705.3	
C-J PRESS (KBAR)	61.4	44.2	34.5	25.8	243.7	210.0	153.8	
C-J VOLUME (CC/G)	0.71869	0.82944	0.92398	1.04961	0.47793	0.50895	0.58011	
C-J TEMP (DEG K)	1126.8	1250.2	1327.0	1392.6	1712.7	1916.9	2164.6	
C-J S(CAL/DEG MOL)	39.99	41.40	42.27	43.07	41.15	42.56	44.38	
C-J ENERGY (CAL/G)	171.53	148.65	134.43	116.68	399.27	395.89	347.52	
GAMMA	3.075	2.945	2.834	2.770	3.487	3.227	3.067	
C-J DETN.HEAT(CAL)	353.6	353.5	353.4	353.3	896.6	894.9	892.4	
LAMDA	7.5999	7.5999	7.5998	7.5998	7.5873	7.5867	7.5857	
VOLUM(K LITTRE/KG)	1.0698	1.0698	1.0698	1.0698	1.0938	1.0938	1.0939	
TOTAL PRODCT(MOLE)	3.5000	3.5000	3.5000	3.5000	4.2500	4.2500	4.2501	
V GAS (MOLES)	3.5000	3.5000	3.5000	3.5000	4.2500	4.2500	4.2501	
V GAS (CC/MOLE)	16.4359	18.9688	21.1309	24.0039	10.6896	11.3834	12.9747	
H2O (MOL %)	57.1437	57.1435	57.1434	57.1431	58.8236	58.8222	58.8154	
N2 (MOL %)	28.5667	28.5608	28.5549	28.5485	35.1673	35.0816	34.9581	
H2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
O2 (MOL %)	14.2801	14.2743	14.2685	14.2622	5.7552	5.6693	5.5441	
NH3 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
OH (MOL %)	0.0000	0.0000	0.0001	0.0003	0.0004	0.0023	0.0126	
H (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NO (MOL %)	0.0093	0.0213	0.0330	0.0458	0.2534	0.4246	0.6698	

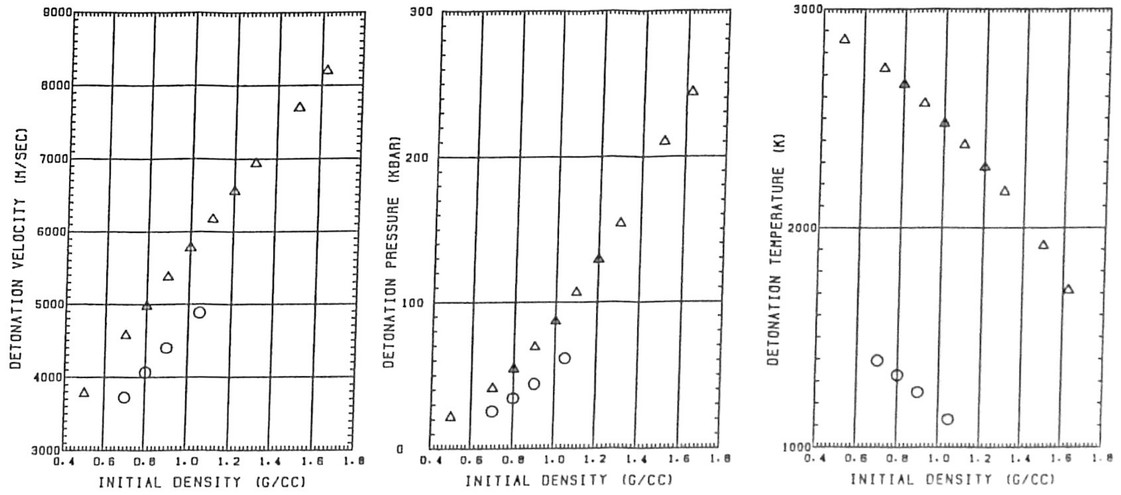
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#HYDRAZINE NITRATE	#
RHO (G/CC)	1.200	1.100	1.000	0.900	0.800	0.700	0.500	
EO (KCAL/MOLE)	-59.03	-59.03	-59.03	-59.03	-59.03	-59.03	-59.03	
MOL.WEIGHT (G)	95.058	95.058	95.058	95.058	95.058	95.058	95.058	
N	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
H	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
O	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
DETN.VEL (M/SEC)	6554.4	6166.8	5772.5	5373.2	4970.8	4568.0	3779.6	
PARTICL.VEL(")	1641.4	1571.6	1499.6	1427.8	1362.6	1283.6	1150.2	
C-J PRESS (KBAR)	129.1	106.6	86.6	69.0	54.2	41.0	21.7	
C-J VOLUME (CC/G)	0.62464	0.67741	0.74023	0.81587	0.90735	1.02716	1.39139	
C-J TEMP (DEG K)	2275.6	2379.1	2476.1	2567.1	2653.8	2728.0	2859.0	
C-J S(CAL/DEG MOL)	45.18	45.93	46.64	47.32	47.98	48.61	49.89	
C-J ENERGY (CAL/G)	321.98	295.17	268.72	243.61	221.89	196.90	158.11	
GAMMA	2.993	2.924	2.850	2.763	2.648	2.559	2.286	
C-J DETN.HEAT(CAL)	891.0	889.5	887.9	886.2	884.2	882.2	877.2	
LAMDA	7.5851	7.5843	7.5835	7.5825	7.5812	7.5798	7.5760	
VOLUM(K LITTRE/KG)	1.0939	1.0939	1.0940	1.0941	1.0943	1.0945	1.0951	
TOTAL PRODCT(MOLE)	4.2503	4.2505	4.2508	4.2512	4.2518	4.2526	4.2549	
V GAS (MOLES)	4.2503	4.2505	4.2508	4.2512	4.2518	4.2526	4.2549	
V GAS (CC/MOLE)	13.9703	15.1497	16.5534	18.2431	20.2857	22.9600	31.0850	
H2O (MOL %)	58.8077	58.7952	58.7766	58.7497	58.7125	58.6649	58.5274	
N2 (MOL %)	34.8963	34.8360	34.7774	34.7202	34.6630	34.6140	34.5195	
H2 (MOL %)	0.0001	0.0003	0.0007	0.0017	0.0037	0.0074	0.0237	
O2 (MOL %)	5.4802	5.4168	5.3535	5.2900	5.2248	5.1666	5.0515	
NH3 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	
OH (MOL %)	0.0244	0.0432	0.0712	0.1107	0.1640	0.2300	0.4089	
H (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0007	
NO (MOL %)	0.7913	0.9084	1.0206	1.1277	1.2320	1.3169	1.4682	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

AMMONIUM NITRATE RHO = 1.0500 G/CC EO = -8.728000E+04 CAL/MOLE

LN P = -3.73925877 E+00 -2.79395199 E+00LN V 3.71514678 E-01LN V*2 -3.66128162 E-02LN V*3 7.07032159 E-04LN V*4

LN T = 6.84874725 E+00 -5.48389494 E-01LN V 3.02548289 E-01LN V*2 -1.67429686 E-01LN V*3 2.85904631 E-02LN V*4

LN E = -1.39312553 E+00 5.31232119 E-01LNP 1.09121144 E-01LN P*2 1.03696212 E-02LN P*3 3.69299902 E-04LN P*4

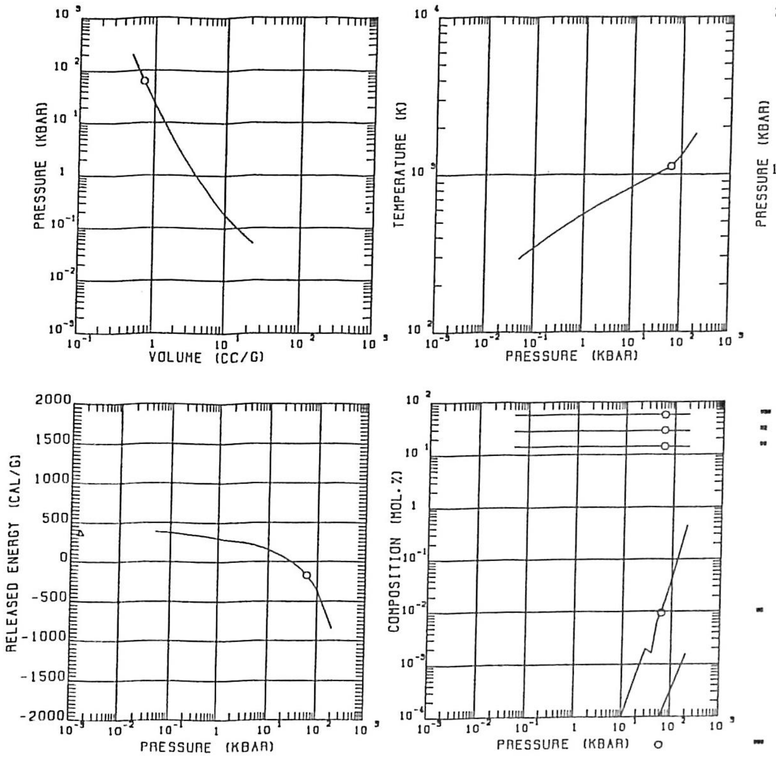
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (195.390)	0.5031	1812.0 (1683.8)	-844.9	0.13535 (0.13450)	3.3571	0.0
100.000 (100.907)	0.6159	1322.1 (1347.9)	-369.8	0.11547 (0.11602)	3.1802	568.3
80.000 (81.025)	0.6603	1224.4 (1263.1)	-270.2	0.11130 (0.11183)	3.1215	868.7
* 61.420 (62.388)	0.7187	1126.8 (1175.3)	-171.6	0.10718 (0.10767)	3.0515	1198.1
60.000 (60.903)	0.7244	1122.3 (1167.9)	-165.2	0.10691 (0.10734)	3.0451	1227.2
50.000 (50.316)	0.7717	1087.4 (1112.4)	-116.1	0.10486 (0.10495)	2.9940	1450.8
40.000 (39.914)	0.8344	1046.2 (1052.6)	-62.7	0.10262 (0.10242)	2.9321	1705.9
30.000 (29.698)	0.9242	996.4 (986.3)	-3.6	0.10015 (0.09971)	2.8532	2008.2
20.000 (19.685)	1.0705	931.8 (909.4)	64.7	0.09729 (0.09675)	2.7438	2389.6
10.000 (9.874)	1.3886	832.3 (808.9)	151.4	0.09367 (0.09329)	2.5617	2942.3
8.000 (7.920)	1.5150	804.0 (782.1)	172.8	0.09277 (0.09249)	2.5040	3099.2
6.000 (5.969)	1.6990	767.5 (750.2)	197.6	0.09173 (0.09160)	2.4306	3288.3
5.000 (4.991)	1.8300	744.8 (731.2)	211.7	0.09114 (0.09110)	2.3844	3401.5
4.000 (4.008)	2.0085	717.8 (708.7)	227.4	0.09048 (0.09055)	2.3282	3533.8
3.000 (3.019)	2.2730	683.5 (680.5)	245.6	0.08972 (0.08991)	2.2563	3695.2
2.000 (2.020)	2.7272	636.3 (641.0)	268.1	0.08878 (0.08909)	2.1562	3907.3
1.000 (1.010)	3.8119	557.5 (570.9)	300.0	0.08745 (0.08778)	1.9896	4234.2
0.800 (0.804)	4.2811	535.0 (546.8)	308.3	0.08710 (0.08736)	1.9370	4332.3
0.600 (0.601)	4.9886	505.0 (515.2)	318.7	0.08667 (0.08683)	1.8718	4451.9
0.500 (0.500)	5.5109	486.6 (494.9)	324.8	0.08641 (0.08650)	1.8317	4524.5
0.400 (0.399)	6.2428	464.8 (469.8)	331.8	0.08612 (0.08610)	1.7842	4610.3
0.300 (0.299)	7.3633	437.6 (437.8)	340.2	0.08577 (0.08560)	1.7258	4716.0
0.200 (0.199)	9.3660	401.0 (394.5)	351.1	0.08531 (0.08498)	1.6498	4856.5
0.100 (0.100)	14.4068	342.1 (333.0)	367.4	0.08463 (0.08428)	1.5398	5076.4
0.080 (0.080)	16.7238	326.5 (318.1)	371.7	0.08445 (0.08422)	1.5093	5145.0
0.060 (0.060)	20.2504	305.0 (305.0)	377.3	0.08421 (0.08430)	1.4757	5228.4
0.050 (0.050)	22.9122	291.9 (300.7)	380.7	0.08407 (0.08446)	1.4574	5279.8

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

K-H-T ISENTROPE THRU C-J POINT



	AMMONIUM	NITRATE
RHO (G/CC)	1.050	
E_0 (KCAL/MOLE)	87.28	
D_{C-J} (M/SEC)	4882.	
P_{C-J} (KBAR)	61.4	
T_{C-J} (K)	1127.	

DATE 82-10 29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

AMMONIUM NITRATE RHO = 1.0500 G/CC EO = -8.728000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	N2	H2	O2	NH3	OH	H	NO
61.420	2.00005	0.99985	0.00000	0.49981	0.00000	0.00000	0.00000	0.00033
60.000	2.00005	0.99985	0.00000	0.49982	0.00000	0.00000	0.00000	0.00031
50.000	2.00006	0.99990	0.00000	0.49986	0.00000	0.00000	0.00000	0.00022
40.000	2.00006	0.99998	0.00000	0.49994	0.00000	0.00000	0.00000	0.00006
30.000	2.00006	0.99998	0.00000	0.49994	0.00000	0.00000	0.00000	0.00007
20.000	2.00007	1.00000	0.00000	0.49995	0.00000	0.00000	0.00000	0.00002
10.000	2.00008	1.00001	0.00000	0.49997	0.00000	0.00000	0.00000	0.00000
8.000	2.00009	1.00002	0.00000	0.49999	0.00000	0.00000	0.00000	0.00000
6.000	2.00010	1.00002	0.00000	0.49999	0.00000	0.00000	0.00000	0.00000
5.000	2.00010	1.00002	0.00000	0.49999	0.00000	0.00000	0.00000	0.00000
4.000	2.00011	1.00002	0.00000	0.49999	0.00000	0.00000	0.00000	0.00000
3.000	2.00011	1.00002	0.00000	0.49999	0.00000	0.00000	0.00000	0.00000
2.000	2.00013	1.00002	0.00000	0.49998	0.00000	0.00000	0.00000	0.00000
1.000	2.00015	1.00003	0.00000	0.49997	0.00000	0.00000	0.00000	0.00000
0.800	2.00016	1.00003	0.00000	0.49996	0.00000	0.00000	0.00000	0.00000
0.600	2.00017	1.00003	0.00000	0.49996	0.00000	0.00000	0.00000	0.00000
0.500	2.00018	1.00004	0.00000	0.49995	0.00000	0.00000	0.00000	0.00000
0.400	2.00019	1.00004	0.00000	0.49994	0.00000	0.00000	0.00000	0.00000
0.300	2.00021	1.00004	0.00000	0.49995	0.00000	0.00000	0.00000	0.00000
0.200	2.00023	1.00005	0.00000	0.49994	0.00000	0.00000	0.00000	0.00000
0.100	2.00028	1.00006	0.00000	0.49992	0.00000	0.00000	0.00000	0.00000
0.080	2.00030	1.00006	0.00000	0.49991	0.00000	0.00000	0.00000	0.00000
0.060	2.00032	1.00006	0.00000	0.49988	0.00000	0.00000	0.00000	0.00000
0.050	2.00034	1.00007	0.00000	0.49990	0.00000	0.00000	0.00000	0.00000
80.000	2.00005	0.99964	0.00000	0.49961	0.00000	0.00000	0.00000	0.00074
100.000	2.00004	0.99926	0.00000	0.49924	0.00000	0.00000	0.00000	0.00149
200.000	1.99999	0.99234	0.00000	0.49231	0.00000	0.00005	0.00000	0.01532

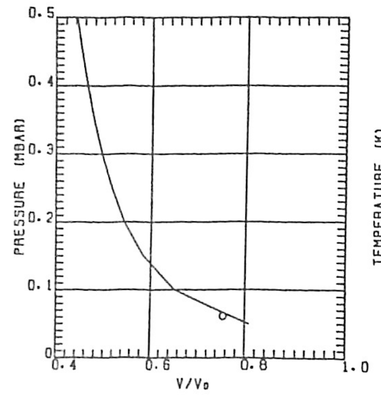
PRESS ;KBAR, PRODUCTS ;MOLES

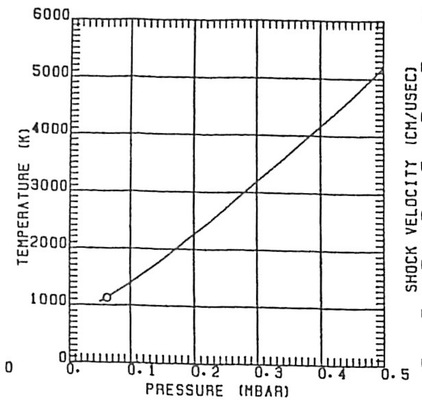
********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

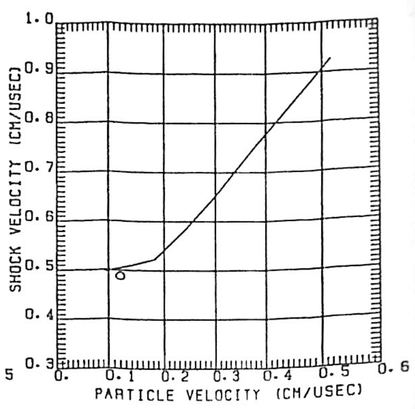
AMMONIUM NITRATE RHO = 1.0500 G/CC, EO = -8.728000E+04 CAL/MOLE

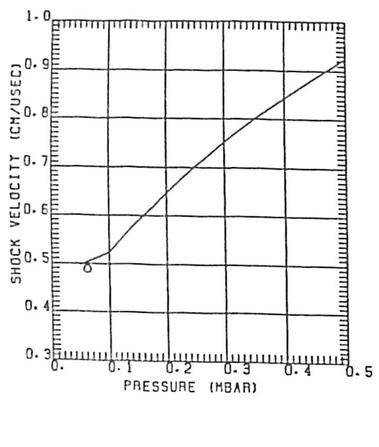
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.4219	0.4311	0.4422	0.4554	0.4717	0.4921	0.5190	0.5574	0.6209	0.7695
TEMP (DEG K)	5191.0	4665.0	4164.0	3673.1	3192.4	2720.3	2258.1	1810.5	1393.7	1068.1
US (M/SEC)	9245.9	8848.7	8432.6	7992.6	7523.8	7018.8	6469.5	5868.7	5231.0	4979.2
UP (M/SEC)	5150.3	4843.3	4517.6	4170.5	3797.4	3392.3	2944.2	2434.2	1820.6	956.3
H2O (MOLE)	1.9692	1.9766	1.9856	1.9921	1.9964	1.9987	1.9997	2.0000	2.0000	2.0001
N2 (MOLE)	0.8043	0.8218	0.8526	0.8865	0.9211	0.9532	0.9783	0.9932	0.9989	0.9999
H2 (MOLE)	0.0010	0.0006	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
O2 (MOLE)	0.2906	0.3110	0.3458	0.3826	0.4193	0.4525	0.4781	0.4932	0.4989	0.4999
NH3 (MOLE)	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OH (MOLE)	0.0585	0.0450	0.0281	0.0156	0.0072	0.0026	0.0006	0.0001	0.0000	0.0000
H (MOLE)	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO (MOLE)	0.3910	0.3563	0.2947	0.2271	0.1577	0.0936	0.0435	0.0136	0.0022	0.0002

K-H-T HUGONIOT









	AMMONIUM NITRATE
RHO (G/CC)	1.050
E_0 (KCAL/MOLE)	-87.28

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

HYDRAZINE NITRATE RHO = 1.6260 G/CC EO = -5.902900E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	N2	H2	O2	NH3	OH	H	NO
243.743	2.50002	1.49462	0.00000	0.24460	0.00000	0.00002	0.00000	0.01076
200.000	2.50002	1.49596	0.00000	0.24594	0.00000	0.00002	0.00000	0.00808
100.000	2.50003	1.49860	0.00000	0.24858	0.00000	0.00001	0.00000	0.00281
80.000	2.50003	1.49899	0.00000	0.24897	0.00000	0.00001	0.00000	0.00203
60.000	2.50003	1.49935	0.00000	0.24932	0.00000	0.00000	0.00000	0.00132
50.000	2.50003	1.49951	0.00000	0.24948	0.00000	0.00000	0.00000	0.00100
40.000	2.50004	1.49965	0.00000	0.24962	0.00000	0.00000	0.00000	0.00072
30.000	2.50004	1.49977	0.00000	0.24974	0.00000	0.00000	0.00000	0.00047
20.000	2.50004	1.49988	0.00000	0.24985	0.00000	0.00000	0.00000	0.00025
10.000	2.50006	1.50000	0.00000	0.24996	0.00000	0.00000	0.00000	0.00002
8.000	2.50006	1.49999	0.00000	0.24995	0.00000	0.00000	0.00000	0.00004
6.000	2.50006	1.50000	0.00000	0.24995	0.00000	0.00000	0.00000	0.00002
5.000	2.50007	1.50001	0.00000	0.24996	0.00000	0.00000	0.00000	0.00000
4.000	2.50007	1.50001	0.00000	0.24996	0.00000	0.00000	0.00000	0.00001
3.000	2.50008	1.50001	0.00000	0.24996	0.00000	0.00000	0.00000	0.00000
2.000	2.50009	1.50002	0.00000	0.24995	0.00000	0.00000	0.00000	0.00000
1.000	2.50011	1.50002	0.00000	0.24995	0.00000	0.00000	0.00000	0.00000
0.800	2.50011	1.50002	0.00000	0.24994	0.00000	0.00000	0.00000	0.00000
0.600	2.50012	1.50002	0.00000	0.24994	0.00000	0.00000	0.00000	0.00000
0.500	2.50013	1.50002	0.00000	0.24994	0.00000	0.00000	0.00000	0.00000
0.400	2.50014	1.50003	0.00000	0.24994	0.00000	0.00000	0.00000	0.00000
0.300	2.50015	1.50003	0.00000	0.24993	0.00000	0.00000	0.00000	0.00000
0.200	2.50017	1.50003	0.00000	0.24992	0.00000	0.00000	0.00000	0.00000
0.100	2.50021	1.50004	0.00000	0.24991	0.00000	0.00000	0.00000	0.00000
0.080	2.50022	1.50004	0.00000	0.24990	0.00000	0.00000	0.00000	0.00000
0.060	2.50024	1.50005	0.00000	0.24990	0.00000	0.00000	0.00000	0.00000
0.050	2.50026	1.50005	0.00000	0.24989	0.00000	0.00000	0.00000	0.00000
0.040	2.50027	1.50006	0.00000	0.24988	0.00000	0.00000	0.00000	0.00000
0.030	2.50030	1.50006	0.00000	0.24988	0.00000	0.00000	0.00000	0.00000
0.020	2.50034	1.50007	0.00000	0.24986	0.00000	0.00000	0.00000	0.00000
300.000	2.50001	1.49185	0.00000	0.24183	0.00000	0.00003	0.00000	0.01630
400.000	2.50000	1.48584	0.00000	0.23582	0.00000	0.00004	0.00000	0.02833
500.000	2.49999	1.47755	0.00000	0.22752	0.00000	0.00006	0.00000	0.04491

PRESS ;KBAR, PRODUCTS ;MOLES

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

HYDRAZINE NITRATE RHO = 1.6260 G/CC EO = -5.902900E+04 CAL/MOLE

P = -3.57593632 E+00 -2.70410538 E+00LN V 3.37078452 E-01LN V**2 -2.43012160 E-02LN V**3 -1.04634231 E-03LN V**4

T = 7.09017563 E+00 -4.35930073 E-01LN V 8.69609714 E-02LN V**2 -3.13827172 E-02LN V**3 3.72362393 E-03LN V**4

E = -1.62560654 E+00 4.67915058 E-01LNP 8.24090242 E-02LN P**2 6.96637109 E-03LN P**3 2.24540723 E-04LN P**4

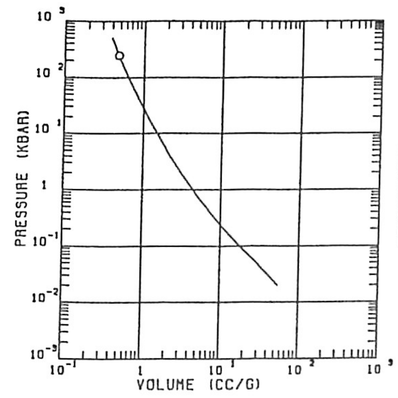
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

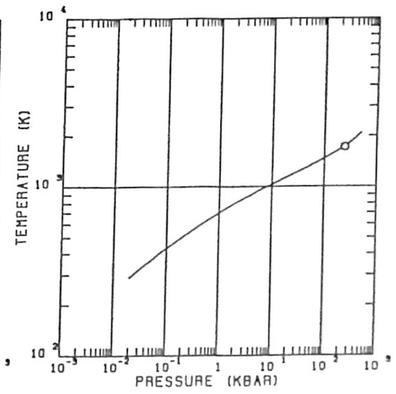
E CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

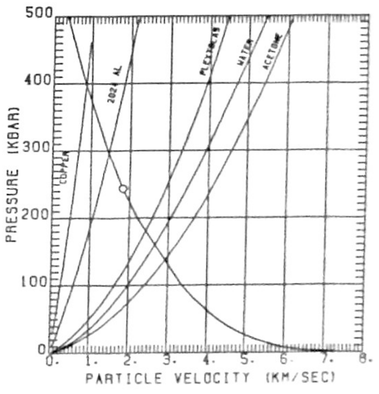
PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (486.640)	0.3910	2093.0 (2008.4)	-1171.8	0.14903 (0.14769)	3.3980	335.5
400.000 (397.603)	0.4151	1950.7 (1927.9)	-882.3	0.13691 (0.13665)	3.3503	837.4
300.000 (304.428)	0.4499	1809.3 (1828.6)	-581.2	0.12432 (0.12478)	3.2869	1431.0
* 243.743 (249.922)	0.4780	1712.7 (1760.1)	-398.5	0.11667 (0.11758)	3.2398	1827.9
200.000 (204.855)	0.5085	1659.0 (1694.8)	-260.9	0.11092 (0.11161)	3.1921	2198.2
100.000 (100.488)	0.6395	1470.0 (1488.3)	104.0	0.09565 (0.09586)	3.0196	3355.9
80.000 (79.828)	0.6907	1418.3 (1429.5)	189.8	0.09206 (0.09210)	2.9634	3680.6
60.000 (59.449)	0.7639	1353.2 (1359.0)	286.1	0.08803 (0.08796)	2.8909	4066.1
50.000 (49.391)	0.8149	1314.2 (1317.3)	339.2	0.08581 (0.08569)	2.8451	4292.4
40.000 (39.411)	0.8828	1269.2 (1268.9)	396.7	0.08340 (0.08323)	2.7892	4552.5
30.000 (29.526)	0.9805	1214.5 (1210.5)	460.8	0.08072 (0.08050)	2.7174	4862.7
20.000 (19.731)	1.1404	1142.6 (1134.9)	535.3	0.07760 (0.07735)	2.6168	5257.0
10.000 (9.988)	1.4925	1028.4 (1020.1)	631.9	0.07356 (0.07338)	2.4461	5836.5
8.000 (8.016)	1.6346	996.1 (985.8)	655.9	0.07256 (0.07238)	2.3909	6003.7
6.000 (6.043)	1.8430	953.0 (943.4)	684.2	0.07137 (0.07125)	2.3201	6206.1
5.000 (5.050)	1.9928	926.0 (917.4)	700.5	0.07069 (0.07061)	2.2753	6327.9
4.000 (4.049)	2.1985	893.5 (886.1)	718.8	0.06993 (0.06989)	2.2203	6471.2
3.000 (3.041)	2.5065	852.0 (846.7)	740.3	0.06903 (0.06906)	2.1494	6647.1
2.000 (2.023)	3.0431	794.3 (792.5)	767.1	0.06790 (0.06802)	2.0499	6879.7
1.000 (1.004)	4.3480	697.8 (702.8)	805.9	0.06628 (0.06650)	1.8840	7239.6
0.800 (0.798)	4.9179	670.0 (674.2)	816.2	0.06585 (0.06606)	1.8321	7347.6
0.600 (0.597)	5.7824	633.3 (638.2)	829.0	0.06531 (0.06551)	1.7682	7479.4
0.500 (0.496)	6.4237	610.6 (615.7)	836.7	0.06499 (0.06517)	1.7293	7559.5
0.400 (0.397)	7.3268	583.7 (588.5)	845.5	0.06463 (0.06476)	1.6837	7654.3
0.300 (0.297)	8.7181	550.0 (554.0)	856.1	0.06418 (0.06426)	1.6286	7771.4
0.200 (0.199)	11.2272	504.2 (506.8)	869.8	0.06361 (0.06359)	1.5593	7927.9
0.100 (0.100)	17.6763	431.3 (430.6)	890.5	0.06274 (0.06256)	1.4684	8176.3
0.080 (0.080)	20.5877	409.7 (407.7)	896.4	0.06249 (0.06228)	1.4478	8252.4
0.060 (0.060)	25.1079	382.4 (379.8)	903.7	0.06219 (0.06198)	1.4287	8347.1
0.050 (0.050)	28.5248	365.8 (363.1)	908.1	0.06201 (0.06181)	1.4212	8405.5
0.040 (0.040)	33.3927	346.2 (343.8)	913.2	0.06179 (0.06166)	1.4170	8475.4
0.030 (0.030)	40.9874	322.0 (321.1)	919.5	0.06153 (0.06154)	1.4203	8562.9
0.020 (0.020)	54.7798	289.8 (293.4)	927.7	0.06119 (0.06157)	1.4422	8681.0

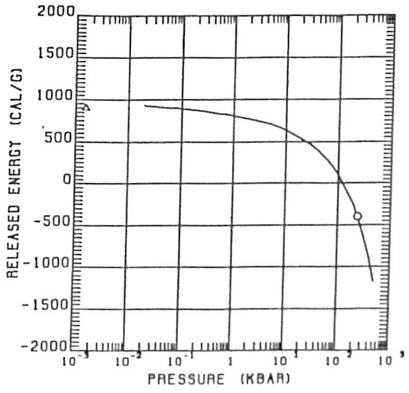
; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

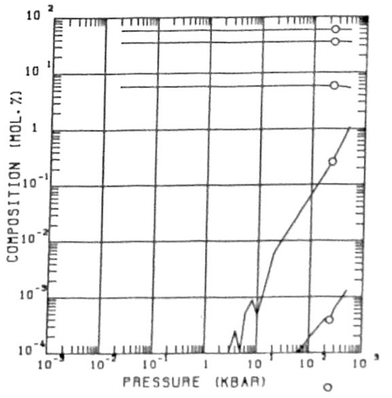
K-H-T ISENTROPE THRU C-J POINT











	HYDRAZINE NITRATE
RHO (G/CC)	1.626
E_0 (KCAL/MOLE)	-59.03
D_{C-J} (M/SEC)	8201.
P_{C-J} (KBAR)	243.7
T_{C-J} (K)	1713.

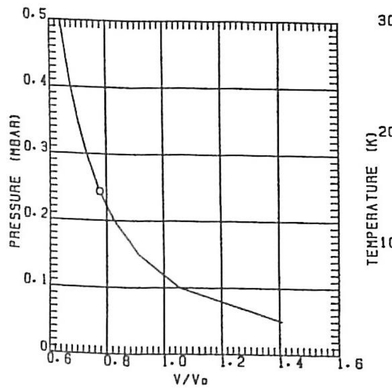
DATE 82-10-29

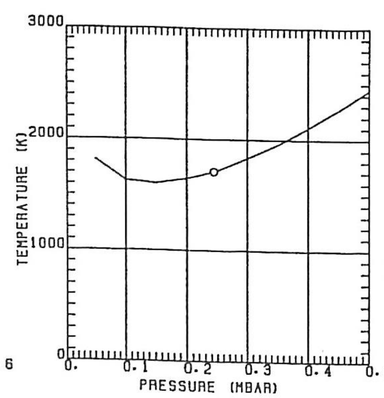
********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

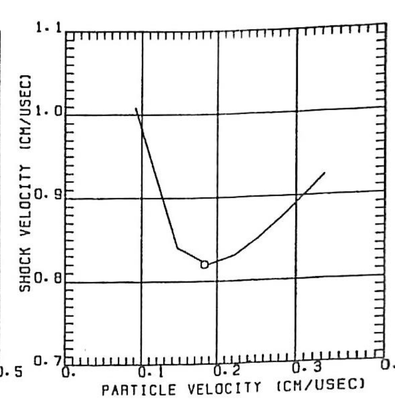
HYDRAZINE NITRATE RHO = 1.6260 G/CC, EO = -5.902900E+04 CAL/MOLE

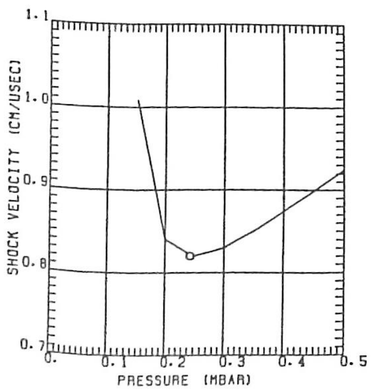
PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3938	0.4044	0.4169	0.4318	0.4504	0.4744	0.5079	0.5592	0.6501	0.8660
TEMP	(DEG K)	2450.4	2272.7	2109.5	1961.4	1832.0	1724.2	1645.3	1602.0	1627.8	1813.2
US	(M/SEC)	9245.8	8990.3	8739.0	8501.5	8301.5	8199.7	8405.3	10084.3	0.0	0.0
UP	(M/SEC)	3325.9	3078.4	2815.0	2531.9	2222.5	1875.1	1463.4	914.8	0.0	0.0
H2O	(MOLE)	2.4998	2.4999	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.4999
N2	(MOLE)	1.4610	1.4717	1.4803	1.4868	1.4913	1.4943	1.4962	1.4971	1.4973	1.4956
H2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
O2	(MOLE)	0.2110	0.2217	0.2303	0.2367	0.2413	0.2443	0.2461	0.2471	0.2472	0.2455
NH3	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OH	(MOLE)	0.0003	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
H	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	(MOLE)	0.0779	0.0565	0.0394	0.0265	0.0174	0.0113	0.0077	0.0057	0.0055	0.0089

K-H-T HUGONIOT









	HYDRAZINE	NITRATE
RHO (G/CC)		1.626
E_0 (KCAL/MOLE)		-59.03

DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		HN/HYDRAZINE 79/21	#HN/H2O/HY 0/5.9/24.1	7#HN/HY 0/70	3#HN HH 36.6	63.4 #HN HH 45	55 #HN HH 40	60 #HN HH 35	65 #
RHO	(G/CC)	1.421	1.384	1.135	1.314	1.267	1.293	1.325	
EO	(KCAL/MOLE)	-15.00	-46.00	12.00	-43.40	-50.00	-45.00	-40.00	
MOL.WEIGHT	(G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
N		3.8039	3.7133	5.3156	3.4631	3.5336	3.4916	3.4497	
H		6.7766	7.3452	10.3156	7.7215	8.2864	7.9502	7.6139	
O		2.4932	2.5367	0.9468	2.7320	2.6347	2.6926	2.7505	
DETN.VEL	(M/SEC)	8526.0	8092.8	7727.4	8011.0	7805.4	7936.2	8087.2	
PARTICL.VEL	(")	2071.8	1964.2	1802.5	1964.3	1934.3	1987.0	1968.1	
C-J PRESS	(KBAR)	251.0	220.0	158.1	206.8	191.3	203.9	210.9	
C-J VOLUME	(CC/G)	0.53272	0.54718	0.67554	0.57443	0.59367	0.57976	0.57105	
C-J TEMP	(DEG K)	2597.9	2056.5	1610.4	2347.0	2138.3	2291.4	2420.7	
C-J S	(CAL/DEG MOL)	46.36	44.39	44.44	45.83	45.36	45.77	46.04	
C-J ENERGY	(CAL/G)	512.95	461.04	388.27	461.12	447.13	471.84	462.89	
GAMMA		3.115	3.120	3.287	3.078	3.035	2.994	3.109	
C-J DETN.HEAT	(CAL)	1350.4	1085.4	969.9	1219.2	1124.6	1191.4	1258.4	
LAMDA		7.6573	7.6685	8.6254	7.4876	7.5525	7.5111	7.4717	
VOLUM	(K LITTRE/KG)	1.1618	1.1758	1.2372	1.2026	1.2187	1.2096	1.2001	
TOTAL PRODCT	(MOLE)	4.7487	4.8060	5.0572	4.9156	4.9814	4.9442	4.9054	
V GAS	(MOLES)	4.7487	4.8060	5.0572	4.9157	4.9814	4.9442	4.9054	
V GAS	(CC/MOLE)	11.2184	11.3854	13.3580	11.6857	11.9178	11.7259	11.6413	
H2O	(MOL %)	52.5033	52.7823	18.7236	55.5778	52.8913	54.4598	56.0722	
N2	(MOL %)	34.3492	31.1073	25.2827	28.3426	26.1470	27.4560	28.7772	
H2	(MOL %)	1.7419	1.0607	1.4490	2.3139	2.3194	2.3757	2.3802	
O2	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3	(MOL %)	11.4050	15.0496	54.5446	13.7654	18.6422	15.7083	12.7701	
OH	(MOL %)	0.0003	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	
H	(MOL %)	0.0003	0.0000	0.0000	0.0001	0.0000	0.0001	0.0002	
NO	(MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

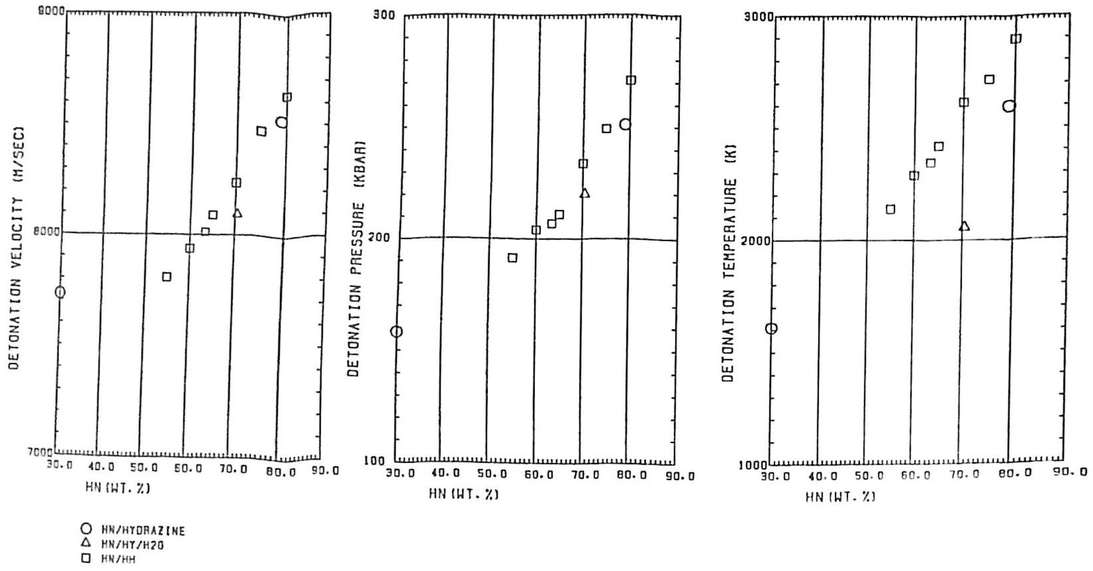
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		HN 70 HH 30	#HN 75 HH 25	#HN 80 HH 20	#
RHO	(G/CC)	1.356	1.414	1.454	
EO	(KCAL/MOLE)	-34.48	-30.00	-25.00	
MOL.WEIGHT	(G)	100.000	100.000	100.000	
N		3.4077	3.3658	3.3238	
H		7.2776	6.9413	6.6050	
O		2.8084	2.8664	2.9243	
DETN.VEL	(M/SEC)	8235.0	8473.5	8639.5	
PARTICL.VEL	(")	2091.3	2078.5	2155.4	
C-J PRESS	(KBAR)	233.5	249.0	270.8	
C-J VOLUME	(CC/G)	0.55018	0.53374	0.51618	
C-J TEMP	(DEG K)	2617.0	2717.5	2895.6	
C-J S	(CAL/DEG MOL)	46.48	46.52	46.77	
C-J ENERGY	(CAL/G)	522.67	516.25	555.16	
GAMMA		2.938	3.077	3.008	
C-J DETN.HEAT	(CAL)	1331.5	1394.8	1463.3	
LAMDA		7.4436	7.4247	7.4044	
VOLUM	(K LITTRE/KG)	1.1886	1.1756	1.1627	
TOTAL PRODCT	(MOLE)	4.8585	4.8052	4.7526	
V GAS	(MOLES)	4.8585	4.8052	4.7526	
V GAS	(CC/MOLE)	11.3241	11.1075	10.8609	
H2O	(MOL %)	57.8049	59.6503	61.5281	
N2	(MOL %)	30.0867	31.3971	32.7385	
H2	(MOL %)	2.1414	1.7020	1.2715	
O2	(MOL %)	0.0000	0.0000	0.0000	
NH3	(MOL %)	9.9661	7.2492	4.4587	
OH	(MOL %)	0.0004	0.0007	0.0017	
H	(MOL %)	0.0004	0.0005	0.0007	
NO	(MOL %)	0.0001	0.0002	0.0008	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

HN 75 HH 25 RHO = 1.4140 G/CC EO = -3.000000E+04 CAL/MOLE

LN P = -3.10468292 E+00 -2.55161381 E+00LN V 3.16908002 E-01LN V*2 -1.66912451 E-02LN V*3 -2.41080462 E-03LN V*

LN T = 7.63631821 E+00 -3.94750774 E-01LN V 1.11731231 E-01LN V*2 -4.29981537 E-02LN V*3 5.50503656 E-03LN V*

LN E = -1.50163174 E+00 5.40945172 E-01LNP 9.22132730 E-02LN P*2 8.32294673 E-03LN P*3 2.93188728 E-04LN P*
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

	PRESSURE (KBAR)		VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)		ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))		GAMMA	MASS VELOC. (M/SEC)
	500.000	(494.477)	0.4283	3363.1	(3230.7)	-1460.1	0.16109	(0.15962)	3.1192	451.6
	400.000	(400.525)	0.4585	3117.5	(3085.8)	-1100.1	0.14603	(0.14572)	3.0718	1012.4
	300.000	(303.391)	0.5023	2861.7	(2911.3)	-722.4	0.13023	(0.13092)	3.0086	1678.3
*	249.030	(252.860)	0.5339	2717.5	(2806.0)	-514.6	0.12153	(0.12286)	2.9667	2078.4
	200.000	(201.721)	0.5766	2624.5	(2684.6)	-335.0	0.11401	(0.11462)	2.9142	2544.9
	100.000	(99.215)	0.7409	2341.9	(2358.9)	113.8	0.09524	(0.09521)	2.7460	3828.9
	80.000	(79.133)	0.8052	2266.2	(2270.1)	221.0	0.09075	(0.09055)	2.6912	4187.7
	60.000	(59.286)	0.8976	2170.2	(2165.3)	343.8	0.08561	(0.08538)	2.6206	4615.3
	50.000	(49.449)	0.9625	2112.4	(2103.9)	412.4	0.08274	(0.08252)	2.5759	4867.8
	40.000	(39.638)	1.0498	2045.9	(2033.2)	487.6	0.07960	(0.07938)	2.5209	5160.1
	30.000	(29.850)	1.1767	1965.0	(1948.6)	572.5	0.07605	(0.07584)	2.4498	5511.9
	20.000	(20.045)	1.3892	1857.8	(1839.4)	674.0	0.07180	(0.07163)	2.3490	5966.6
	10.000	(10.128)	1.8789	1684.7	(1672.2)	811.8	0.06603	(0.06600)	2.1742	6655.4
	8.000	(8.104)	2.0846	1632.6	(1621.6)	848.2	0.06451	(0.06449)	2.1169	6859.1
	6.000	(6.070)	2.3954	1564.9	(1558.2)	891.9	0.06268	(0.06271)	2.0426	7110.0
	5.000	(5.050)	2.6241	1522.0	(1518.7)	917.8	0.06160	(0.06167)	1.9954	7262.6
	4.000	(4.025)	2.9447	1470.6	(1470.9)	947.4	0.06036	(0.06047)	1.9376	7443.6
	3.000	(3.002)	3.4360	1405.3	(1409.8)	982.8	0.05888	(0.05902)	1.8637	7667.2
	2.000	(1.987)	4.3149	1315.4	(1324.5)	1028.4	0.05697	(0.05714)	1.7621	7964.5
	1.000	(0.991)	6.5315	1167.0	(1179.8)	1096.9	0.05410	(0.05426)	1.6023	8427.4
	0.800	(0.791)	7.5306	1124.5	(1132.7)	1115.4	0.05333	(0.05340)	1.5554	8568.3
	0.600	(0.595)	9.0755	1067.9	(1072.9)	1139.1	0.05234	(0.05235)	1.5007	8741.9
	0.500	(0.497)	10.2423	1032.4	(1035.4)	1153.5	0.05174	(0.05171)	1.4695	8848.6
	0.400	(0.399)	11.9147	990.2	(989.9)	1170.3	0.05103	(0.05096)	1.4353	8976.5
	0.300	(0.301)	14.5455	936.9	(932.6)	1191.0	0.05017	(0.05004)	1.3987	9136.8
	0.200	(0.202)	19.4125	864.2	(856.2)	1218.6	0.04902	(0.04885)	1.3638	9355.0
	0.100	(0.101)	32.3462	749.7	(743.8)	1261.1	0.04724	(0.04715)	1.3585	9710.8
	0.080	(0.080)	38.2837	716.4	(714.3)	1273.5	0.04672	(0.04671)	1.3736	9821.8
	0.060	(0.059)	47.6761	675.9	(682.4)	1288.6	0.04608	(0.04625)	1.4066	9962.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

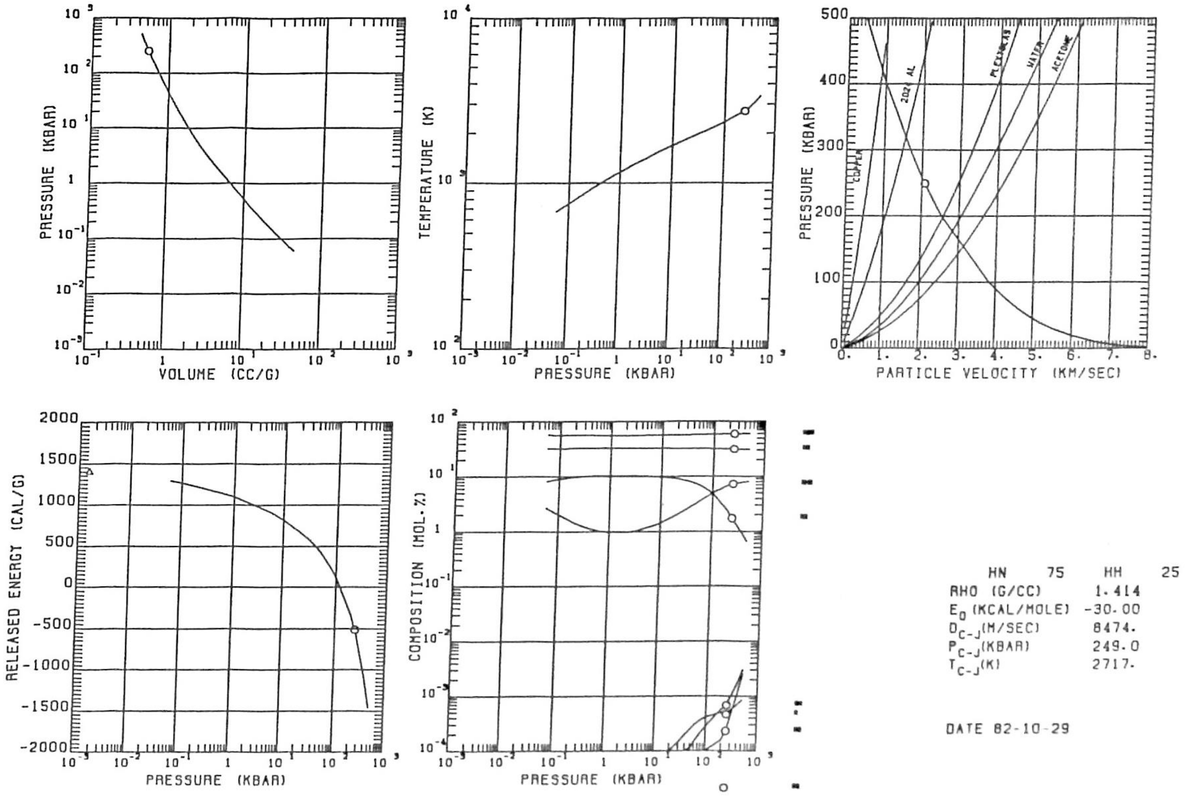
HN 75 HH 25 RHO = 1.4140 G/CC EO = -3.000000E+04 CAL/MOLE

THE ISENTROPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	N2	H2	O2	NH3	OH	H	NO
249.030	2.86634	1.50885	0.08223	0.00000	0.34804	0.00003	0.00002	0.00001
200.000	2.86634	1.51948	0.11411	0.00000	0.32679	0.00003	0.00002	0.00001
100.000	2.86637	1.56069	0.23771	0.00000	0.24438	0.00001	0.00002	0.00000
80.000	2.86638	1.57449	0.27911	0.00000	0.21677	0.00001	0.00002	0.00000
60.000	2.86638	1.59079	0.32799	0.00000	0.18419	0.00001	0.00001	0.00000
50.000	2.86639	1.60001	0.35567	0.00000	0.16573	0.00001	0.00001	0.00000
40.000	2.86641	1.61015	0.38605	0.00000	0.14547	0.00000	0.00001	0.00000
30.000	2.86639	1.62118	0.41918	0.00000	0.12339	0.00000	0.00001	0.00000
20.000	2.86641	1.63323	0.45530	0.00000	0.09930	0.00000	0.00000	0.00000
10.000	2.86642	1.64646	0.49497	0.00000	0.07285	0.00000	0.00000	0.00000
8.000	2.86641	1.64942	0.50386	0.00000	0.06693	0.00000	0.00000	0.00000
6.000	2.86642	1.65238	0.51275	0.00000	0.06100	0.00000	0.00000	0.00000
5.000	2.86642	1.65385	0.51715	0.00000	0.05806	0.00000	0.00000	0.00000
4.000	2.86643	1.65535	0.52163	0.00000	0.05507	0.00000	0.00000	0.00000
3.000	2.86643	1.65679	0.52595	0.00000	0.05219	0.00000	0.00000	0.00000
2.000	2.86644	1.65798	0.52950	0.00000	0.04982	0.00000	0.00000	0.00000
1.000	2.86648	1.65781	0.52895	0.00000	0.05016	0.00000	0.00000	0.00000
0.800	2.86649	1.65755	0.52817	0.00000	0.05068	0.00000	0.00000	0.00000
0.600	2.86648	1.65647	0.52492	0.00000	0.05284	0.00000	0.00000	0.00000
0.500	2.86649	1.65546	0.52190	0.00000	0.05485	0.00000	0.00000	0.00000
0.400	2.86651	1.65394	0.51730	0.00000	0.05791	0.00000	0.00000	0.00000
0.300	2.86651	1.65130	0.50939	0.00000	0.06318	0.00000	0.00000	0.00000
0.200	2.86654	1.64595	0.49332	0.00000	0.07388	0.00000	0.00000	0.00000
0.100	2.86658	1.63138	0.44957	0.00000	0.10302	0.00000	0.00000	0.00000
0.080	2.86658	1.62517	0.43092	0.00000	0.11546	0.00000	0.00000	0.00000
0.060	2.86660	1.61598	0.40332	0.00000	0.13385	0.00000	0.00000	0.00000
300.000	2.86631	1.50289	0.06439	0.00000	0.35995	0.00005	0.00003	0.00002
400.000	2.86624	1.49569	0.04288	0.00000	0.37433	0.00009	0.00003	0.00005
500.000	2.86611	1.49166	0.03099	0.00000	0.38231	0.00014	0.00004	0.00012

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



HN	75 HH 25
RHO (G/CC)	1.414
E_0 (KCAL/MOLE)	-30.00
D_{C-J}(M/SEC)	8474.
P_{C-J}(KBAR)	249.0
T_{C-J}(K)	2717.

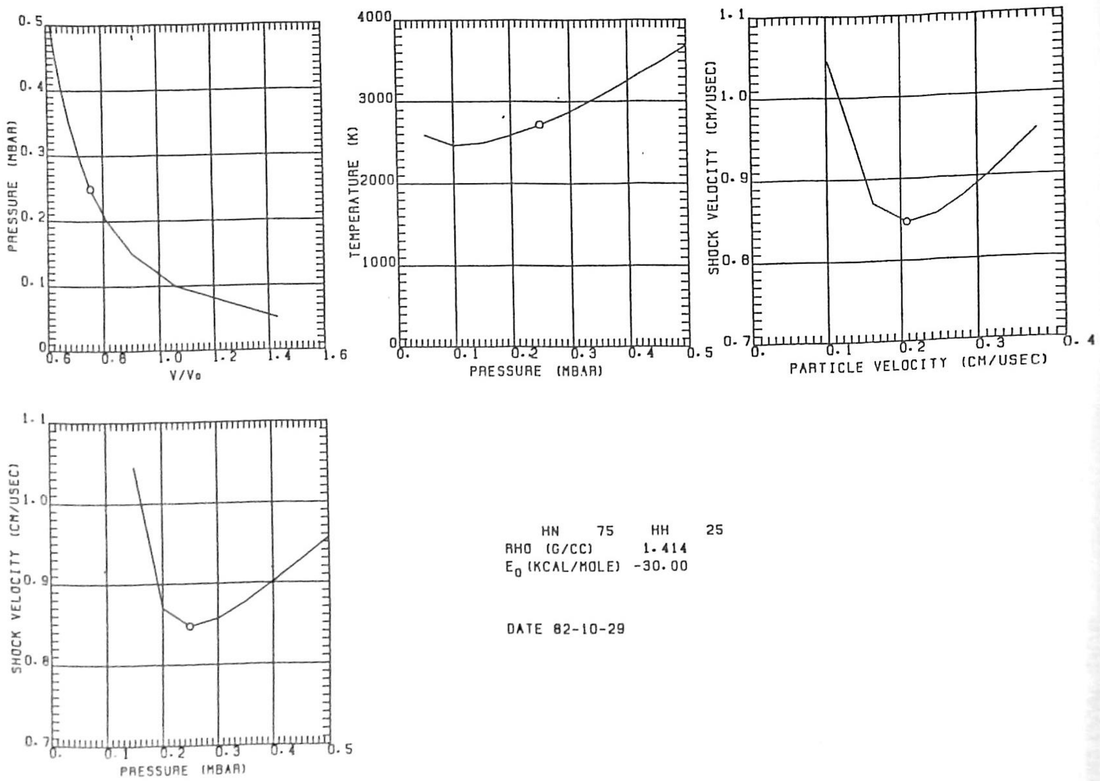
DATE 82-10-29

********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

HN 75 HH 25 RHO = 1.4140 G/CC, EO = -3.000000E+04 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.4337	0.4462	0.4613	0.4797	0.5029	0.5331	0.5751	0.6385	0.7491	1.0118
TEMP	(DEG K)	3685.2	3464.3	3255.8	3060.0	2880.9	2720.7	2587.6	2494.3	2468.6	2593.2
US	(M/SEC)	9561.1	9286.6	9019.9	8771.2	8568.7	8474.5	8700.9	10450.6	0.0	0.0
UP	(M/SEC)	3698.4	3426.9	3136.2	2822.0	2476.0	2086.3	1625.6	1015.1	0.0	0.0
H2O	(MOLE)	2.8656	2.8659	2.8661	2.8662	2.8663	2.8663	2.8664	2.8664	2.8663	2.8662
N2	(MOLE)	1.4961	1.4969	1.4983	1.5002	1.5034	1.5086	1.5178	1.5352	1.5697	1.6292
H2	(MOLE)	0.0449	0.0470	0.0507	0.0565	0.0660	0.0815	0.1091	0.1613	0.2646	0.4434
O2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.3733	0.3717	0.3691	0.3653	0.3589	0.3485	0.3302	0.2953	0.2264	0.1073
OH	(MOLE)	0.0004	0.0003	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
H	(MOLE)	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
NO	(MOLE)	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

K-H-T HUGONIOT



HN 75 HH 25
RHO (G/CC) 1.414
E_0 (KCAL/MOLE) -30.00

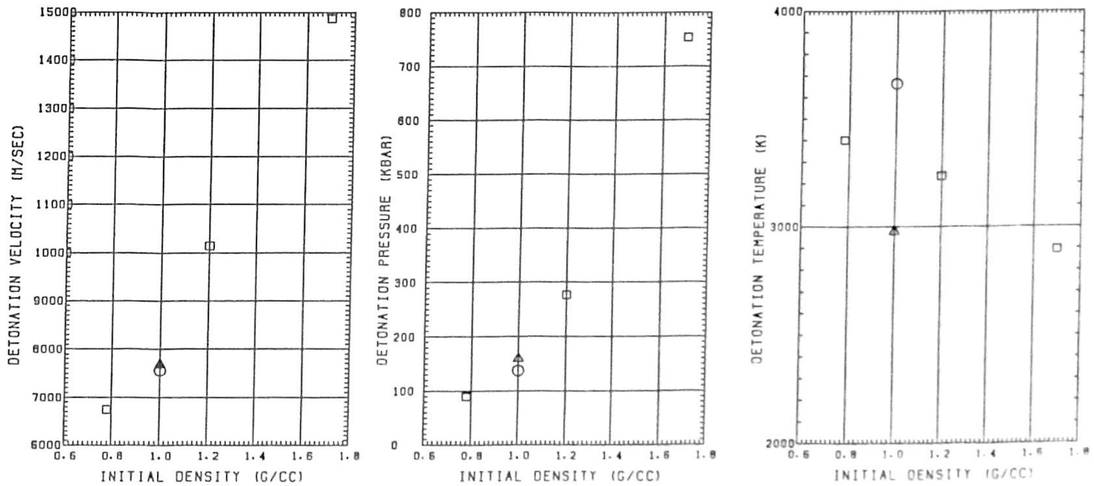
DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	B10H12 + 5 HYDRZINE	#B10H12 + 10 HYDRAZINE	#B5H9 + 2.5HYDRAZINE	#B5H9 + 2.5HYDRAZINE	#B5H9 + 2.5HYDRAZINE	#
RHO (G/CC)	1.000	1.000	1.700	1.200	0.780	
EO (KCAL/MOLE)	86.15	146.00	38.00	38.00	38.00	
MOL.WEIGHT (G)	280.432	440.658	143.240	143.240	143.240	
B	10.0000	10.0000	5.0000	5.0000	5.0000	
H	32.0000	52.0000	19.0000	19.0000	19.0000	
N	10.0000	20.0000	5.0000	5.0000	5.0000	
DETN.VEL (M/SEC)	7563.3	7687.4	14866.2	10140.3	6745.1	
PARTICL.VEL(")	1817.8	2068.9	2980.2	2277.8	1700.2	
C-J PRESS (KBAR)	137.5	159.0	753.2	277.2	89.5	
C-J VOLUME (CC/G)	0.75966	0.73088	0.47031	0.64615	0.95889	
C-J TEMP (DEG K)	3661.8	2977.8	2894.6	3233.8	3400.3	
C-J S(CAL/DEG MOL)	46.36	52.72	37.89	40.96	43.07	
C-J ENERGY (CAL/G)	394.86	511.51	1061.40	620.01	345.45	
GAMMA	3.161	2.716	3.988	3.452	2.967	
C-J DETN.HEAT(CAL)	2440.4	1917.2	2358.4	2357.2	2354.4	
LAMDA	2.8971	5.6057	2.8999	2.8993	2.8980	
VOLUM(K LITTRE/KG)	1.3971	1.2186	1.6226	1.6229	1.6236	
TOTAL PRODCT(MOLE)	26.0141	31.9494	14.5003	14.5020	14.5058	
V GAS (MOLES)	16.0141	21.9494	9.5003	9.5020	9.5058	
V GAS (CC/MOLE)	8.4767	11.2387	4.1223	6.1537	10.0955	
V SOL BN(S (CC/G)	0.31141	0.30374	0.22729	0.27465	0.33352	
N2 (MOL %)	0.0000	1.4832	0.0000	0.0000	0.0000	
H2 (MOL %)	61.4506	38.8736	65.5138	65.4943	65.4510	
NH3 (MOL %)	0.0001	28.3331	0.0003	0.0002	0.0001	
H (MOL %)	0.1086	0.0106	0.0037	0.0275	0.0799	
BN(S) (MOL %)	38.4407	31.2995	34.4822	34.4781	34.4690	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



○ B10H12 + 5 HYDRZINE
△ B10H12 + 10 HYDRAZINE
□ B5H9 + 2.5HYDRAZINE

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

B10H12 + 5 HYDRZINE RHO = 1.0000 G/CC EO = 8.615000E+04 CAL/MOLE

LN P = -2.74065399 E+00 -2.58174706 E+00LN V 5.12911618 E-01LN V*2 -7.66029358 E-02LN V*3 4.03621048 E-03LN V*4

LN T = 8.15830803 E+00 -2.55617678 E-01LN V 4.89649959 E-02LN V*2 -8.45583528 E-03LN V*3 4.80984338 E-04LN V*4

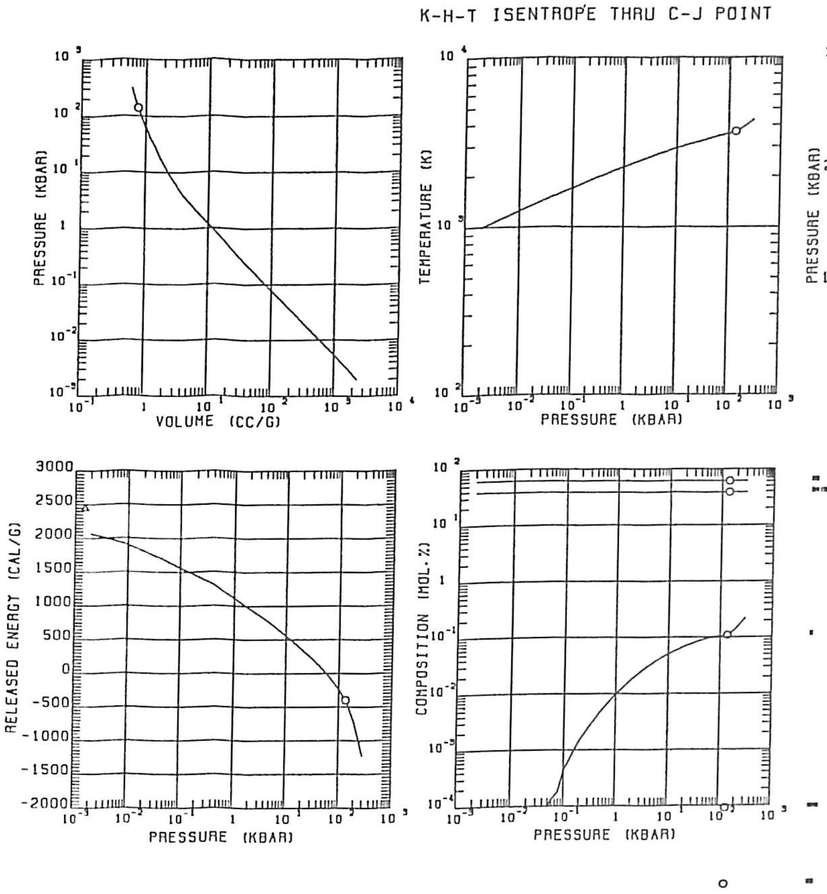
LN E = -1.54672146 E+00 3.70428860 E-01LNP 4.97862473 E-02LN P*2 4.52884287 E-03LN P*3 1.27255393 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
300.000 (278.132)	0.6004	4302.9 (4034.4)	-1227.4	0.15136 (0.14541)	3.1670	209.0
200.000 (192.238)	0.6766	3914.9 (3890.0)	-729.9	0.13054 (0.13108)	3.0186	1097.1
* 137.481 (136.609)	0.7597	3661.8 (3761.0)	-394.8	0.11652 (0.12014)	2.8814	1817.7
100.000 (101.090)	0.8453	3571.2 (3650.8)	-236.9	0.10991 (0.11221)	2.7608	2367.9
80.000 (81.890)	0.9133	3508.1 (3575.6)	-136.6	0.10571 (0.10726)	2.6766	2729.1
60.000 (62.350)	1.0134	3426.8 (3480.4)	-17.6	0.10074 (0.10150)	2.5681	3170.5
50.000 (52.384)	1.0855	3375.1 (3420.9)	52.8	0.09779 (0.09816)	2.4991	3438.5
40.000 (42.231)	1.1851	3311.4 (3348.5)	134.4	0.09438 (0.09436)	2.4141	3755.9
30.000 (29.694)	1.3772	3228.9 (3233.3)	233.0	0.09025 (0.08986)	2.2765	4245.1
20.000 (20.365)	1.6343	3112.1 (3113.7)	362.8	0.08482 (0.08414)	2.1314	4733.0
10.000 (10.225)	2.3067	2914.8 (2904.9)	562.6	0.07646 (0.07564)	1.8755	5547.2
8.000 (8.131)	2.6135	2852.1 (2838.0)	622.2	0.07397 (0.07315)	1.7940	5800.2
6.000 (6.035)	3.1013	2771.6 (2752.5)	696.4	0.07086 (0.07009)	1.6917	6119.0
5.000 (4.992)	3.4770	2720.5 (2698.9)	742.2	0.06895 (0.06822)	1.6290	6316.8
4.000 (3.956)	4.0244	2658.0 (2634.1)	797.2	0.06664 (0.06599)	1.5554	6554.5
3.000 (2.932)	4.9073	2577.2 (2552.0)	866.7	0.06374 (0.06320)	1.4665	6854.2
2.000 (1.929)	6.6054	2462.9 (2439.3)	962.3	0.05974 (0.05942)	1.3555	7264.2
1.000 (0.960)	11.4058	2269.1 (2255.6)	1119.2	0.05317 (0.05324)	1.2135	7933.4
0.800 (0.771)	13.6998	2208.0 (2198.8)	1167.7	0.05114 (0.05132)	1.1816	8141.3
0.600 (0.583)	17.4123	2130.7 (2127.1)	1228.6	0.04859 (0.04888)	1.1503	8404.5
0.500 (0.489)	20.3027	2082.6 (2082.5)	1266.3	0.04702 (0.04736)	1.1358	8568.9
0.400 (0.395)	24.5331	2024.9 (2028.6)	1311.2	0.04514 (0.04552)	1.1233	8768.1
0.300 (0.300)	31.3624	1952.2 (1960.1)	1367.5	0.04278 (0.04320)	1.1151	9021.9
0.200 (0.204)	44.4247	1853.5 (1865.4)	1443.5	0.03960 (0.04001)	1.1160	9374.9
0.100 (0.104)	80.8040	1694.4 (1707.4)	1564.6	0.03453 (0.03481)	1.1415	9967.8
0.080 (0.083)	98.0088	1645.8 (1657.7)	1601.3	0.03300 (0.03321)	1.1533	10155.7
0.060 (0.062)	125.7097	1584.8 (1594.5)	1647.1	0.03109 (0.03121)	1.1693	10395.5
0.050 (0.052)	147.1927	1547.1 (1555.1)	1675.2	0.02991 (0.02998)	1.1792	10545.7
0.040 (0.041)	178.5482	1502.1 (1507.6)	1708.6	0.02851 (0.02852)	1.1906	10727.5
0.030 (0.031)	229.0051	1445.7 (1447.7)	1750.3	0.02677 (0.02670)	1.2027	10958.0
0.020 (0.020)	325.1616	1369.2 (1366.5)	1806.3	0.02442 (0.02426)	1.2125	11274.6
0.010 (0.010)	591.8020	1246.7 (1237.7)	1894.7	0.02072 (0.02049)	1.1983	11789.1
0.008 (0.008)	717.0640	1208.6 (1199.7)	1921.9	0.01959 (0.01938)	1.1827	11946.3
0.006 (0.006)	918.6611	1161.4 (1153.2)	1955.2	0.01820 (0.01803)	1.1528	12143.4
0.005 (0.005)	1074.6753	1132.3 (1125.4)	1975.6	0.01734 (0.01722)	1.1276	12264.7
0.004 (0.004)	1301.9307	1097.5 (1093.2)	1999.8	0.01633 (0.01627)	1.0894	12409.4
0.003 (0.003)	1666.6824	1053.8 (1055.0)	2029.9	0.01507 (0.01512)	1.0275	12589.8
0.002 (0.002)	2359.2317	994.5 (1007.6)	2070.3	0.01338 (0.01364)	0.9133	12832.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

B10H12 + 5 HYDRZINE RHO = 1.0000 G/CC EO = 8.615000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

ESS	N2	H2	NH3	H	BN(S)
7.481	0.00000	15.98584	0.00002	0.02825	10.00000
0.000	0.00000	15.98632	0.00002	0.02730	10.00000
0.000	0.00000	15.98678	0.00002	0.02639	10.00000
0.000	0.00000	15.98749	0.00002	0.02497	10.00000
0.000	0.00000	15.98800	0.00002	0.02394	10.00000
0.000	0.00000	15.98868	0.00002	0.02258	10.00000
0.000	0.00000	15.98963	0.00002	0.02069	10.00000
0.000	0.00000	15.99103	0.00002	0.01789	10.00000
0.000	0.00000	15.99337	0.00002	0.01321	10.00000
.000	0.00000	15.99408	0.00001	0.01180	10.00000
.000	0.00000	15.99494	0.00001	0.01009	10.00000
.000	0.00000	15.99545	0.00001	0.00906	10.00000
.000	0.00000	15.99604	0.00001	0.00788	10.00000
.000	0.00000	15.99675	0.00001	0.00648	10.00000
.000	0.00000	15.99761	0.00001	0.00476	10.00000
.800	0.00000	15.99871	0.00001	0.00256	10.00000
.600	0.00000	15.99897	0.00001	0.00204	10.00000
.500	0.00000	15.99924	0.00001	0.00150	10.00000
.400	0.00000	15.99938	0.00001	0.00122	10.00000
.300	0.00000	15.99952	0.00001	0.00094	10.00000
.200	0.00000	15.99966	0.00001	0.00065	10.00000
.100	0.00000	15.99980	0.00001	0.00038	10.00000
.080	0.00000	15.99994	0.00001	0.00011	10.00000
.060	0.00000	15.99997	0.00001	0.00005	10.00000
.050	0.00000	15.99997	0.00001	0.00003	10.00000
.040	0.00000	15.99998	0.00001	0.00002	10.00000
.030	0.00000	15.99999	0.00001	0.00001	10.00000
.020	0.00000	15.99999	0.00001	0.00001	10.00000
.010	0.00000	15.99999	0.00000	0.00001	10.00000
.008	0.00000	15.99999	0.00000	0.00000	10.00000
.006	0.00000	15.99999	0.00000	0.00000	10.00000
.005	0.00000	15.99999	0.00000	0.00000	10.00000
.004	0.00000	15.99999	0.00000	0.00000	10.00000
.003	0.00000	16.00000	0.00000	0.00000	10.00000
.002	0.00000	16.00000	0.00000	0.00000	10.00000
0.000	0.00000	16.00000	0.00000	0.00000	10.00000
0.000	0.00000	15.98103	0.00002	0.03787	10.00000
0.000	0.00000	15.97131	0.00003	0.05731	10.00000

RESS ;KBAR, PRODUCTS ;MOLES

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

B5H9 + 2.5HYDRAZINE RHO = 1.7000 G/CC EO = 3.800000E+04 CAL/MOLE

LN P = -2.74255848 E+00 -2.80531311 E+00LN V 5.69405317 E-01LN V*2 -8.48248005 E-02LN V*3 4.51096147 E-03LN V*4

LN T = 7.73405361 E+00 -2.87653267 E-01LN V 5.41396439 E-02LN V*2 -1.00170448 E-02LN V*3 5.95393125 E-04LN V*4

LN E = -1.80675888 E+00 4.16660845 E-01LNP 5.17224371 E-02LN P*2 4.40771878 E-03LN P*3 1.05620289 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
1000.000 (1007.697)	0.4384	3278.4 (3022.9)	-1730.1	0.17239 (0.16419)	3.9276	2092.7
800.000 (813.267)	0.4633	2970.5 (2957.8)	-1192.1	0.14988 (0.14999)	3.8404	2798.7
* 753.183 (767.387)	0.4704	2894.6 (2940.4)	-1060.0	0.14435 (0.14649)	3.8168	2980.2
600.000 (602.672)	0.5015	2820.9 (2869.2)	-780.2	0.13264 (0.13443)	3.7184	3695.8
500.000 (496.956)	0.5285	2766.4 (2813.6)	-583.6	0.12442 (0.12591)	3.6397	4229.6
400.000 (393.118)	0.5641	2699.7 (2747.4)	-365.1	0.11528 (0.11667)	3.5440	4837.2
300.000 (291.736)	0.6146	2621.6 (2665.4)	-124.2	0.10520 (0.10636)	3.4221	5551.0
200.000 (193.325)	0.6952	2520.6 (2556.2)	156.3	0.09346 (0.09432)	3.2538	6438.7
100.000 (98.112)	0.8645	2365.5 (2385.4)	518.0	0.07833 (0.07865)	2.9766	7695.4
80.000 (79.269)	0.9297	2320.3 (2334.0)	610.1	0.07447 (0.07458)	2.8897	8045.6
60.000 (60.382)	1.0234	2259.5 (2269.8)	719.5	0.06989 (0.06987)	2.7791	8465.5
50.000 (50.822)	1.0897	2223.7 (2229.9)	781.0	0.06732 (0.06715)	2.7093	8717.2
40.000 (41.151)	1.1795	2178.9 (2182.0)	851.8	0.06436 (0.06408)	2.6242	9011.5
30.000 (29.006)	1.3526	2119.2 (2104.5)	936.7	0.06081 (0.06045)	2.4841	9468.7
20.000 (20.193)	1.5718	2036.9 (2026.6)	1044.3	0.05631 (0.05589)	2.3407	9906.8
10.000 (10.345)	2.1278	1896.0 (1888.6)	1204.9	0.04958 (0.04921)	2.0827	10637.7
8.000 (8.260)	2.3761	1851.1 (1843.6)	1251.7	0.04763 (0.04729)	1.9986	10864.8
6.000 (6.154)	2.7644	1793.9 (1785.8)	1308.9	0.04523 (0.04494)	1.8915	11150.1
5.000 (5.096)	3.0599	1759.2 (1749.3)	1342.7	0.04382 (0.04351)	1.8247	11326.7
4.000 (4.047)	3.4814	1714.4 (1705.3)	1384.8	0.04206 (0.04182)	1.7457	11536.5
3.000 (3.004)	4.1505	1658.6 (1648.9)	1435.8	0.03993 (0.03973)	1.6480	11800.0
2.000 (1.975)	5.4095	1580.4 (1570.9)	1504.6	0.03705 (0.03692)	1.5212	12157.7
1.000 (0.972)	8.8937	1448.0 (1440.9)	1615.4	0.03241 (0.03241)	1.3436	12738.1
0.800 (0.777)	10.5374	1404.6 (1400.2)	1650.4	0.03095 (0.03102)	1.2991	12916.8
0.600 (0.583)	13.1960	1350.1 (1348.4)	1693.6	0.02914 (0.02928)	1.2512	13143.0
0.500 (0.487)	15.2604	1316.1 (1315.9)	1720.2	0.02803 (0.02820)	1.2265	13283.7
0.400 (0.391)	18.2743	1274.9 (1276.7)	1752.0	0.02669 (0.02690)	1.2022	13453.2
0.300 (0.296)	23.1214	1222.9 (1226.9)	1791.8	0.02503 (0.02526)	1.1798	13667.8
0.200 (0.200)	32.3366	1151.8 (1158.1)	1845.3	0.02279 (0.02303)	1.1637	13963.7
0.100 (0.102)	57.6672	1036.7 (1044.2)	1930.0	0.01925 (0.01944)	1.1687	14453.6
0.080 (0.082)	69.5552	1002.1 (1008.5)	1955.0	0.01820 (0.01835)	1.1763	14607.9
0.060 (0.062)	88.5239	958.2 (963.4)	1986.3	0.01689 (0.01699)	1.1886	14803.6
0.050 (0.051)	103.2204	931.9 (935.3)	2004.9	0.01612 (0.01615)	1.1973	14926.5
0.040 (0.041)	124.3450	898.8 (901.8)	2028.0	0.01515 (0.01517)	1.2079	15073.6
0.030 (0.031)	158.2092	858.4 (859.6)	2056.0	0.01398 (0.01395)	1.2209	15260.6
0.020 (0.020)	222.0573	803.9 (802.5)	2093.2	0.01242 (0.01233)	1.2350	15516.9
0.010 (0.010)	395.6206	716.7 (712.7)	2151.4	0.00999 (0.00987)	1.2367	15932.5
0.008 (0.008)	476.5200	690.7 (686.1)	2168.4	0.00927 (0.00915)	1.2284	16060.0
0.006 (0.006)	605.0730	657.9 (653.6)	2189.6	0.00839 (0.00828)	1.2096	16219.1
0.005 (0.005)	704.3384	638.3 (634.1)	2202.2	0.00786 (0.00777)	1.1922	16317.4
0.004 (0.004)	846.5256	613.8 (611.6)	2217.8	0.00721 (0.00717)	1.1650	16433.5
0.003 (0.003)	1073.5576	583.8 (584.6)	2236.5	0.00642 (0.00645)	1.1187	16578.6

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

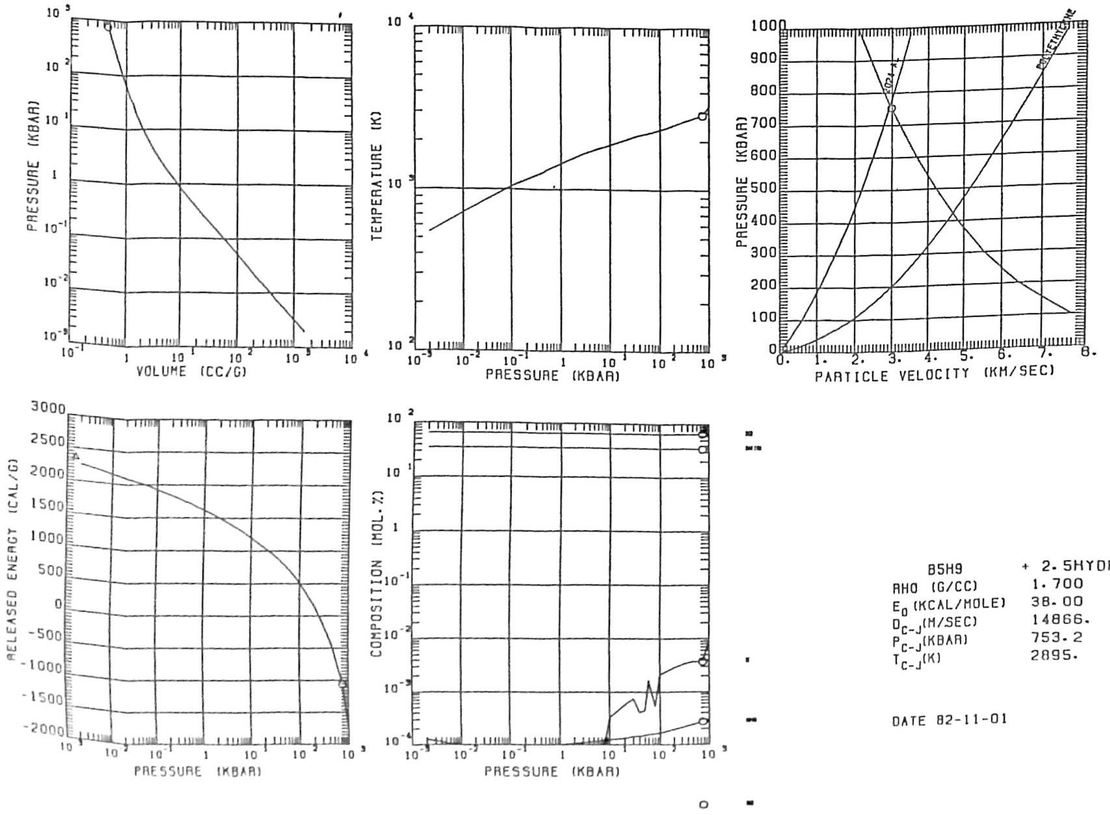
B5H9 + 2.5HYDRAZINE RHO = 1.7000 G/CC EO = 3.800000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	N2	H2	NH3	H	BN(S)
753.183	0.00000	9.49967	0.00004	0.00054	5.00000
600.000	0.00000	9.49967	0.00004	0.00054	5.00000
500.000	0.00000	9.49968	0.00003	0.00053	5.00000
400.000	0.00000	9.49970	0.00003	0.00051	5.00000
300.000	0.00000	9.49972	0.00003	0.00048	5.00000
200.000	0.00000	9.49975	0.00003	0.00042	5.00000
100.000	0.00000	9.49981	0.00002	0.00031	5.00000
80.000	0.00000	9.49983	0.00002	0.00028	5.00000
60.000	0.00000	9.49985	0.00002	0.00024	5.00000
50.000	0.00000	9.49984	0.00002	0.00026	5.00000
40.000	0.00000	9.49984	0.00002	0.00026	5.00000
30.000	0.00000	9.49982	0.00002	0.00011	5.00000
20.000	0.00000	9.49983	0.00002	0.00028	5.00000
10.000	0.00000	9.49985	0.00002	0.00025	5.00000
8.000	0.00000	9.49987	0.00002	0.00021	5.00000
6.000	0.00000	9.49987	0.00002	0.00021	5.00000
5.000	0.00000	9.49987	0.00002	0.00020	5.00000
4.000	0.00000	9.49987	0.00002	0.00021	5.00000
3.000	0.00000	9.49987	0.00002	0.00021	5.00000
2.000	0.00000	9.49987	0.00002	0.00020	5.00000
1.000	0.00000	9.49988	0.00001	0.00020	5.00000
0.800	0.00000	9.49988	0.00001	0.00020	5.00000
0.600	0.00000	9.49988	0.00001	0.00020	5.00000
0.500	0.00000	9.49988	0.00001	0.00020	5.00000
0.400	0.00000	9.49988	0.00001	0.00020	5.00000
0.300	0.00000	9.49988	0.00001	0.00020	5.00000
0.200	0.00000	9.49988	0.00001	0.00020	5.00000
0.100	0.00000	9.49988	0.00001	0.00020	5.00000
0.080	0.00000	9.49988	0.00001	0.00020	5.00000
0.060	0.00000	9.49988	0.00001	0.00020	5.00000
0.050	0.00000	9.49988	0.00001	0.00020	5.00000
0.040	0.00000	9.49988	0.00001	0.00020	5.00000
0.030	0.00000	9.49988	0.00001	0.00020	5.00000
0.020	0.00000	9.49988	0.00001	0.00020	5.00000
0.010	0.00000	9.49989	0.00001	0.00020	5.00000
0.008	0.00000	9.49988	0.00002	0.00020	5.00000
0.006	0.00000	9.49989	0.00002	0.00020	5.00000
0.005	0.00000	9.49989	0.00002	0.00020	5.00000
0.004	0.00000	9.49988	0.00002	0.00020	5.00000
0.003	0.00000	9.49989	0.00002	0.00020	5.00000
0.002	0.00000	9.49988	0.00002	0.00020	5.00000
800.000	0.00000	9.49961	0.00004	0.00066	5.00000
1000.000	0.00000	9.49928	0.00004	0.00132	5.00000

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



B5H9	+ 2.5HYDRAZIN
RHO (G/CC)	1.700
E_0 (KCAL/MOLE)	38.00
D_{C-J}(M/SEC)	14866.
P_{C-J}(KBAR)	753.2
T_{C-J}(K)	2895.

DATE 82-11-01

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	C2F3CL 12 # EDB 1
RHO (G/CC)	1.660
EO (KCAL/MOLE)	-179.30
MOL.WEIGHT (G)	154.792
C	2.6000
F	3.6000
CL	1.2000
H	1.8000
B	1.0000
DETN.VEL (M/SEC)	6511.6
PARTICL.VEL(")	1584.7
C-J PRESS (KBAR)	171.3
C-J VOLUME (CC/G)	0.45580
C-J TEMP (DEG K)	3398.0
C-J S(CAL/DEG MOL)	70.25
C-J ENERGY (CAL/G)	300.12
GAMMA	3.109
C-J DETN.HEAT(CAL)	1017.6
LAMDA	16.2492
VOLUM(K LITTRE/KG)	0.4425
TOTAL PRODCT(MOLE)	5.4000
V GAS (MOLES)	2.8000
V GAS (CC/MOLE)	21.6716
V SOL C(S) (CC/G)	0.31621
BF3 (MOL %)	18.5186
CF4 (MOL %)	0.0000
H2 (MOL %)	0.0658
H (MOL %)	0.0004
CH4 (MOL %)	0.0006
HCL (MOL %)	22.0890
CCL4 (MOL %)	0.0000
HF (MOL %)	11.1101
F2 (MOL %)	0.0000
CL2 (MOL %)	0.0661
CLF (MOL %)	0.0014
C(S) (MOL %)	48.1479

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

C2F3CL 12 EDB 1 RHO = 1.6600 G/CC EO = -1.793000E+05 CAL/MOLE

LN P = -3.99059963 E+00 -2.45077705 E+00LN V 4.28578079 E-01LN V*2 -5.98300844 E-02LN V*3 3.03074112 E-03LN V*4

LN T = 7.95405388 E+00 -2.30569720 E-01LN V 6.84478283 E-02LN V*2 -1.55000836 E-02LN V*3 1.11722876 E-03LN V*4

LN E = -1.68763256 E+00 3.64388406 E-01LNP 6.34354949 E-02LN P*2 5.22081181 E-03LN P*3 1.55899310 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (429.759)	0.3473	4453.2 (4000.7)	-1041.1	0.14356 (0.13916)	3.5725	9.3
300.000 (309.328)	0.3813	3974.5 (3846.1)	-719.5	0.13010 (0.12962)	3.4548	605.8
200.000 (200.003)	0.4339	3529.4 (3654.9)	-397.2	0.11662 (0.11878)	3.2986	1334.1
* 171.298 (170.236)	0.4558	3398.0 (3588.1)	-299.8	0.11254 (0.11530)	3.2408	1584.7
100.000 (96.239)	0.5467	3240.0 (3367.1)	-98.3	0.10411 (0.10543)	3.0365	2399.1
80.000 (76.696)	0.5898	3178.0 (3285.5)	-30.9	0.10129 (0.10217)	2.9552	2688.8
60.000 (57.568)	0.6510	3105.6 (3187.2)	43.7	0.09817 (0.09855)	2.8527	3030.4
50.000 (48.147)	0.6936	3061.3 (3128.7)	85.4	0.09643 (0.09654)	2.7890	3230.6
40.000 (38.776)	0.7504	3010.7 (3060.4)	130.9	0.09452 (0.09436)	2.7120	3461.0
30.000 (28.767)	0.8395	2948.5 (2970.7)	181.3	0.09241 (0.09191)	2.6062	3759.1
20.000 (19.725)	0.9740	2865.2 (2864.5)	243.2	0.08983 (0.08907)	2.4734	4106.6
10.000 (10.243)	1.2862	2728.2 (2697.6)	327.5	0.08630 (0.08542)	2.2462	4644.7
8.000 (8.260)	1.4177	2682.6 (2647.2)	351.0	0.08531 (0.08449)	2.1729	4806.0
6.000 (6.229)	1.6191	2626.0 (2584.2)	378.6	0.08416 (0.08343)	2.0781	5007.9
5.000 (5.196)	1.7690	2588.9 (2545.4)	395.3	0.08346 (0.08281)	2.0180	5132.1
4.000 (4.150)	1.9816	2544.3 (2499.1)	414.5	0.08266 (0.08212)	1.9446	5281.1
3.000 (3.095)	2.3129	2486.5 (2441.2)	437.9	0.08168 (0.08130)	1.8511	5467.5
2.000 (2.039)	2.9216	2405.2 (2363.5)	468.9	0.08038 (0.08024)	1.7232	5719.7
1.000 (1.000)	4.5368	2266.9 (2239.8)	517.3	0.07835 (0.07858)	1.5231	6122.5
0.800 (0.797)	5.2829	2221.6 (2201.7)	532.4	0.07773 (0.07805)	1.4654	6245.4
0.600 (0.594)	6.4832	2164.6 (2153.0)	550.8	0.07696 (0.07738)	1.3965	6400.8
0.500 (0.494)	7.4137	2127.6 (2122.2)	562.5	0.07647 (0.07694)	1.3565	6497.2
0.400 (0.394)	8.7823	2082.9 (2084.2)	576.3	0.07589 (0.07641)	1.3114	6613.9
0.300 (0.295)	11.0078	2024.9 (2034.3)	594.0	0.07515 (0.07570)	1.2602	6762.1
0.200 (0.196)	15.3243	1942.8 (1961.5)	618.4	0.07413 (0.07467)	1.2019	6967.1
0.100 (0.099)	27.6105	1803.1 (1829.4)	658.9	0.07243 (0.07282)	1.1399	7307.1
0.080 (0.079)	33.5027	1759.0 (1784.9)	671.4	0.07191 (0.07221)	1.1292	7413.9
0.060 (0.060)	43.0698	1703.6 (1726.4)	687.1	0.07125 (0.07143)	1.1209	7550.2
0.050 (0.050)	50.5285	1668.6 (1688.8)	697.0	0.07084 (0.07093)	1.1186	7635.6
0.040 (0.040)	61.4773	1627.2 (1642.7)	708.6	0.07035 (0.07032)	1.1182	7739.2
0.030 (0.030)	79.2040	1574.9 (1583.2)	723.1	0.06974 (0.06956)	1.1210	7871.4
0.020 (0.020)	113.2699	1503.5 (1500.9)	742.9	0.06892 (0.06854)	1.1292	8055.1
0.010 (0.010)	208.7109	1386.6 (1370.2)	774.8	0.06758 (0.06703)	1.1459	8360.8
0.008 (0.008)	254.0975	1350.9 (1332.3)	784.5	0.06718 (0.06663)	1.1497	8456.9
0.006 (0.006)	327.4917	1306.0 (1287.5)	796.6	0.06667 (0.06621)	1.1520	8578.8
0.005 (0.005)	384.5244	1277.8 (1261.9)	804.1	0.06636 (0.06600)	1.1514	8654.8
0.004 (0.004)	468.0588	1244.5 (1233.8)	813.0	0.06598 (0.06582)	1.1482	8746.6
0.003 (0.003)	602.9607	1202.6 (1203.5)	824.1	0.06552 (0.06571)	1.1388	8862.5
0.002 (0.002)	861.4736	1145.4 (1174.1)	839.1	0.06489 (0.06585)	1.1138	9021.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

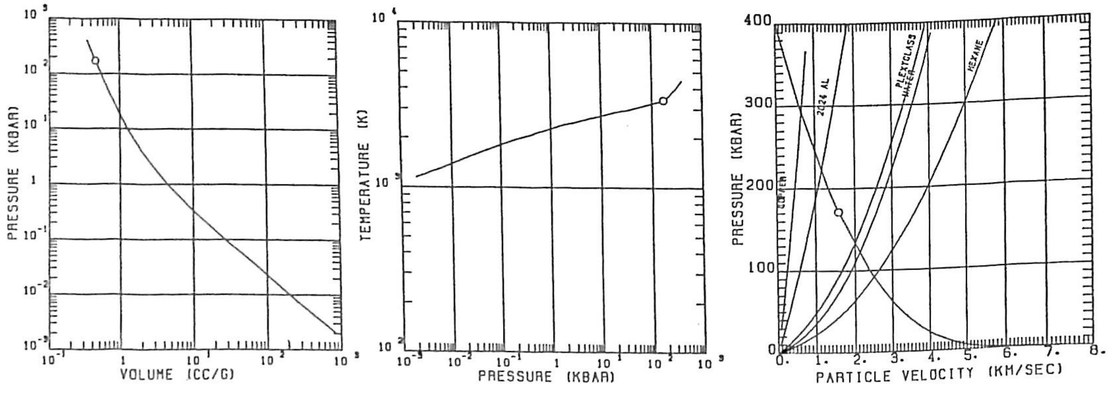
C2F3CL 12 EDB 1 RHO = 1.6600 G/CC EO = -1.793000E+05 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	BF3	CF4	H2	H	CH4	HCL	CCL4	HF	F2	CL2	CLF	C(S)
171.298	1.00000	0.00000	0.00356	0.00002	0.00003	1.19279	0.00000	0.59994	0.00000	0.00357	0.00008	2.59997
100.000	1.00000	0.00000	0.00494	0.00004	0.00003	1.19003	0.00000	0.59995	0.00000	0.00495	0.00008	2.59997
80.000	1.00000	0.00000	0.00542	0.00005	0.00003	1.18906	0.00000	0.59994	0.00000	0.00544	0.00007	2.59997
60.000	1.00000	0.00000	0.00598	0.00005	0.00003	1.18794	0.00000	0.59994	0.00000	0.00600	0.00007	2.59997
50.000	1.00000	0.00000	0.00627	0.00006	0.00003	1.18736	0.00000	0.59994	0.00000	0.00629	0.00006	2.59997
40.000	1.00000	0.00000	0.00657	0.00006	0.00003	1.18676	0.00000	0.59995	0.00000	0.00659	0.00006	2.59997
30.000	1.00000	0.00000	0.00685	0.00006	0.00003	1.18620	0.00000	0.59995	0.00000	0.00687	0.00005	2.59997
20.000	1.00000	0.00000	0.00704	0.00007	0.00002	1.18583	0.00000	0.59996	0.00000	0.00706	0.00005	2.59997
10.000	1.00000	0.00000	0.00685	0.00006	0.00002	1.18624	0.00000	0.59998	0.00000	0.00686	0.00003	2.59998
8.000	1.00000	0.00000	0.00665	0.00006	0.00002	1.18666	0.00000	0.59996	0.00000	0.00665	0.00003	2.59998
6.000	1.00000	0.00000	0.00634	0.00005	0.00001	1.18728	0.00000	0.59998	0.00000	0.00635	0.00002	2.59998
5.000	1.00000	0.00000	0.00610	0.00005	0.00001	1.18776	0.00000	0.59999	0.00000	0.00611	0.00002	2.59998
4.000	1.00000	0.00000	0.00580	0.00004	0.00001	1.18837	0.00000	0.59999	0.00000	0.00581	0.00002	2.59999
3.000	0.99999	0.00000	0.00537	0.00004	0.00001	1.18923	0.00000	0.60001	0.00000	0.00538	0.00001	2.59999
2.000	1.00000	0.00000	0.00475	0.00003	0.00000	1.19050	0.00000	0.60001	0.00000	0.00475	0.00001	2.59999
1.000	1.00000	0.00000	0.00369	0.00002	0.00000	1.19262	0.00000	0.60002	0.00000	0.00369	0.00000	2.59999
0.800	1.00000	0.00000	0.00336	0.00001	0.00000	1.19329	0.00000	0.60001	0.00000	0.00336	0.00000	2.60000
0.600	0.99999	0.00000	0.00296	0.00001	0.00000	1.19408	0.00000	0.60004	0.00000	0.00296	0.00000	2.60000
0.500	1.00000	0.00000	0.00271	0.00001	0.00000	1.19458	0.00000	0.60002	0.00000	0.00271	0.00000	2.60000
0.400	0.99999	0.00000	0.00243	0.00001	0.00000	1.19514	0.00000	0.60004	0.00000	0.00243	0.00000	2.60000
0.300	1.00000	0.00000	0.00208	0.00001	0.00000	1.19583	0.00000	0.60002	0.00000	0.00209	0.00000	2.60000
0.200	1.00000	0.00000	0.00165	0.00000	0.00000	1.19671	0.00000	0.60004	0.00000	0.00165	0.00000	2.60000
0.100	0.99999	0.00000	0.00105	0.00000	0.00000	1.19791	0.00000	0.60005	0.00000	0.00105	0.00000	2.60000
0.080	0.99999	0.00000	0.00089	0.00000	0.00000	1.19822	0.00000	0.60007	0.00000	0.00090	0.00000	2.60000
0.060	0.99999	0.00000	0.00072	0.00000	0.00000	1.19856	0.00000	0.60007	0.00000	0.00073	0.00000	2.60001
0.050	1.00000	0.00000	0.00062	0.00000	0.00000	1.19875	0.00000	0.60005	0.00000	0.00063	0.00000	2.60001
0.040	0.99999	0.00000	0.00052	0.00000	0.00000	1.19895	0.00000	0.60007	0.00000	0.00054	0.00000	2.60001
0.030	0.99999	0.00000	0.00041	0.00000	0.00000	1.19917	0.00000	0.60007	0.00000	0.00043	0.00000	2.60001
0.020	1.00000	0.00000	0.00029	0.00000	0.00000	1.19942	0.00000	0.60007	0.00000	0.00031	0.00000	2.60001
0.010	0.99999	0.00000	0.00015	0.00000	0.00000	1.19971	0.00000	0.60008	0.00000	0.00017	0.00000	2.60001
0.008	1.00000	0.00000	0.00011	0.00000	0.00000	1.19976	0.00000	0.60007	0.00000	0.00014	0.00000	2.60002
0.006	0.99999	0.00000	0.00008	0.00000	0.00000	1.19983	0.00000	0.60010	0.00000	0.00011	0.00000	2.60002
0.005	0.99999	0.00000	0.00004	0.00000	0.00000	1.19992	0.00000	0.60010	0.00000	0.00006	0.00000	2.60002
0.004	1.00000	0.00000	0.00005	0.00000	0.00000	1.19990	0.00000	0.60008	0.00000	0.00007	0.00000	2.60002
0.003	0.99999	0.00000	0.00002	0.00000	0.00000	1.19996	0.00000	0.60011	0.00000	0.00005	0.00000	2.60002
0.002	1.00000	0.00000	0.00001	0.00000	0.00000	1.19998	0.00000	0.60010	0.00000	0.00004	0.00000	2.60002
200.000	1.00000	0.00000	0.00354	0.00003	0.00004	1.19282	0.00000	0.59992	0.00000	0.00355	0.00010	2.59997
300.000	1.00000	0.00000	0.00359	0.00004	0.00006	1.19269	0.00000	0.59985	0.00000	0.00357	0.00018	2.59994
400.000	1.00000	0.00000	0.00393	0.00006	0.00011	1.19194	0.00000	0.59971	0.00000	0.00388	0.00031	2.59990

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



C2F3CL 12 EOB 1

RHO (G/CC)	1.660
E_0 (KCAL/MOLE)	-179.30
D_{C-J}(M/SEC)	6512.
P_{C-J}(KBAR)	171.3
T_{C-J}(K)	3398.

DATE 82-11-01

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	TNM/EDB 3.75/1 MOLE	#TNM/EDB 4.45/1 MOLE #
RHO (G/CC)	1.400	1.427
EO (KCAL/MOLE)	65.00	71.16
MOL.WEIGHT (G)	885.400	1022.622
C	5.7500	6.4500
N	15.0000	17.8000
O	30.0000	35.6000
H	18.0000	18.0000
B	10.0000	10.0000
DETN.VEL (M/SEC)	6739.3	6720.9
PARTICL.VEL(")	1826.9	1805.8
C-J PRESS (KBAR)	172.4	173.2
C-J VOLUME (CC/G)	0.52066	0.51249
C-J TEMP (DEG K)	5593.7	5720.5
C-J S(CAL/DEG MOL)	66.76	67.98
C-J ENERGY (CAL/G)	398.85	389.67
GAMMA	2.689	2.722
C-J DETN.HEAT(CAL)	1979.7	1979.9
LAMDA	9.6057	10.0435
VOLUM(K LITTRE/KG)	0.7477	0.7147
TOTAL PRODCT(MOLE)	27.0588	29.8724
V GAS (MOLES)	27.0588	29.8724
V GAS (CC/MOLE)	17.0366	17.5441
V SOL C(S) (CC/G)	0.32739	0.32764
H2O (MOL %)	27.0845	28.5530
CO2 (MOL %)	6.3332	15.1992
CO (MOL %)	14.8474	6.3927
N2 (MOL %)	27.0221	28.8439
B2O3 (MOL %)	18.4781	16.7376
HBO2 (MOL %)	0.0005	0.0007
H2 (MOL %)	4.0912	0.7905
O2 (MOL %)	0.0100	0.3053
NH3 (MOL %)	1.0731	0.0966
OH (MOL %)	0.4987	1.2025
H (MOL %)	0.1745	0.0756
CH4 (MOL %)	0.0694	0.0002
NO (MOL %)	0.3176	1.8024
C(S) (MOL %)	0.0	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TNM/EDB 3.75/1 MOLE RHO = 1.4000 G/CC EO = 6.500149E+04 CAL/MOLE

LN P = -3.33207321 E+00 -2.15879059 E+00LN V 4.23711836 E-01LN V*2 7.53488392 E-04LN V*3 -7.10194707 E-02LN V*4

LN T = 8.45541477 E+00 -2.19130516 E-01LN V 4.21389230 E-02LN V*2 -4.58072349 E-02LN V*3 2.56613083 E-02LN V*4

LN E = -1.43271351 E+00 6.25086248 E-01LNP 1.66563511 E-01LN P*2 2.64862850 E-02LN P*3 1.61367585 E-03LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (199.771)	0.4929	5752.4 (5734.2)	-522.6	0.12186 (0.12162)	2.6566	1549.7
* 172.369 (172.749)	0.5207	5593.7 (5618.1)	-398.7	0.11668 (0.11703)	2.6319	1826.9
100.000 (99.868)	0.6443	5249.4 (5243.5)	-88.1	0.10369 (0.10363)	2.5067	2769.6
80.000 (79.911)	0.7050	5115.0 (5112.8)	16.9	0.09929 (0.09926)	2.4426	3117.3
60.000 (59.990)	0.7946	4954.3 (4957.5)	136.9	0.09427 (0.09426)	2.3500	3538.9
50.000 (50.035)	0.8593	4865.7 (4864.8)	205.5	0.09140 (0.09139)	2.2862	3792.4
40.000 (40.051)	0.9489	4757.8 (4755.4)	284.1	0.08811 (0.08811)	2.2032	4091.1
30.000 (30.030)	1.0851	4619.3 (4618.3)	378.0	0.08418 (0.08420)	2.0897	4459.6
20.000 (19.975)	1.3297	4424.2 (4427.1)	499.6	0.07910 (0.07912)	1.9237	4953.1
10.000 (9.986)	1.9591	4097.1 (4098.7)	684.4	0.07136 (0.07137)	1.6743	5733.9
8.000 (8.005)	2.2408	3996.8 (3995.3)	737.9	0.06913 (0.06911)	1.6228	5969.7
6.000 (6.011)	2.6790	3871.4 (3869.0)	803.0	0.06640 (0.06639)	1.5934	6264.6
5.000 (4.994)	3.0088	3794.2 (3796.1)	842.1	0.06477 (0.06479)	1.6023	6447.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

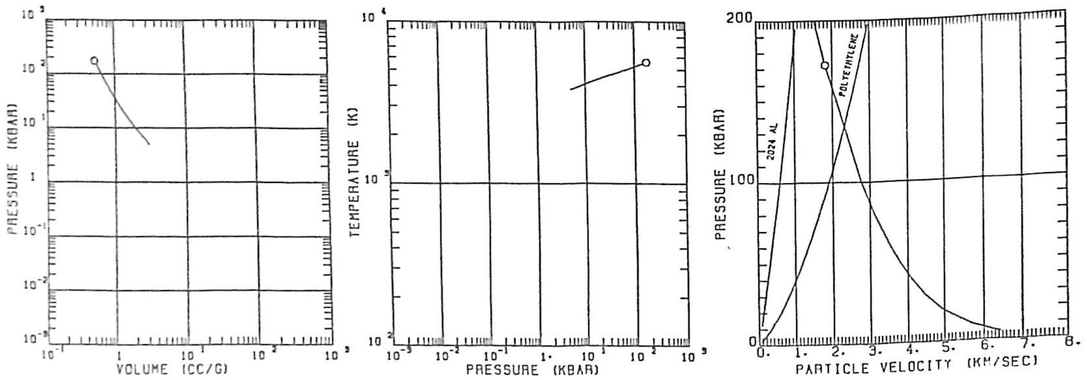
TNM/EDB 3.75/1 MOLE RHO = 1.4000 G/CC EO = 6.500149E+04 CAL/MOLE

THE ISENTROPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	B2O3	HBO2	H2	O2	NH3	OH	H	CH4	NO
	C(S)												
172.349	7.32867	1.71362	4.01764	7.31191	4.99993	0.00013	1.10734	0.00270	0.29020	0.13502	0.04725	0.01874	0.08598
	0.0												
100.000	7.25082	1.64068	4.10456	7.35776	4.99861	0.00279	1.35409	0.00663	0.15628	0.22044	0.07904	0.00477	0.12819
	0.0												
80.000	7.19495	1.62415	4.12305	7.36428	4.99617	0.00767	1.43321	0.00924	0.12260	0.26256	0.09440	0.00281	0.14884
	0.0												
60.000	7.12630	1.61769	4.13081	7.37136	4.98791	0.02418	1.51483	0.01247	0.09102	0.30425	0.11020	0.00151	0.16625
	0.0												
50.000	7.10425	1.63075	4.11817	7.38124	4.97671	0.04657	1.54767	0.01297	0.07606	0.30537	0.11172	0.00108	0.16146
	0.0												
40.000	7.07203	1.64829	4.10099	7.39237	4.95244	0.09513	1.57954	0.01329	0.06142	0.30243	0.11214	0.00072	0.15384
	0.0												
30.000	7.01503	1.67162	4.07793	7.40580	4.89542	0.20916	1.60796	0.01315	0.04703	0.29156	0.11044	0.00045	0.14137
	0.0												
20.000	6.88558	1.70214	4.04763	7.42369	4.74554	0.50891	1.62628	0.01192	0.03263	0.26424	0.10428	0.00024	0.11999
	0.0												
10.000	6.49688	1.73653	4.01338	7.45067	4.27966	1.44069	1.61275	0.00822	0.01773	0.19899	0.08751	0.00009	0.08092
	0.0												
8.000	6.33584	1.74162	4.00831	7.45786	4.08851	1.82298	1.60106	0.00699	0.01462	0.17749	0.08162	0.00007	0.06965
	0.0												
6.000	6.11744	1.74486	4.00509	7.46599	3.83096	2.33809	1.58372	0.00553	0.01144	0.15106	0.07402	0.00005	0.05658
	0.0												
5.000	5.97761	1.74547	4.00450	7.47048	3.66708	2.66585	1.57231	0.00470	0.00982	0.13542	0.06929	0.00004	0.04922
	0.0												
200.000	7.32569	1.75247	3.97060	7.29024	4.99997	0.00005	1.02827	0.00213	0.34227	0.11725	0.04026	0.02693	0.07724
	0.0												

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



TNM/EDB 3.75/1 MOLE
RHO (G/CC) 1.400
E_0 (KCAL/MOLE) 65.00
D_{C-J}(M/SEC) 6739.
P_{C-J}(KBAR) 172.4
T_{C-J}(K) 5594.

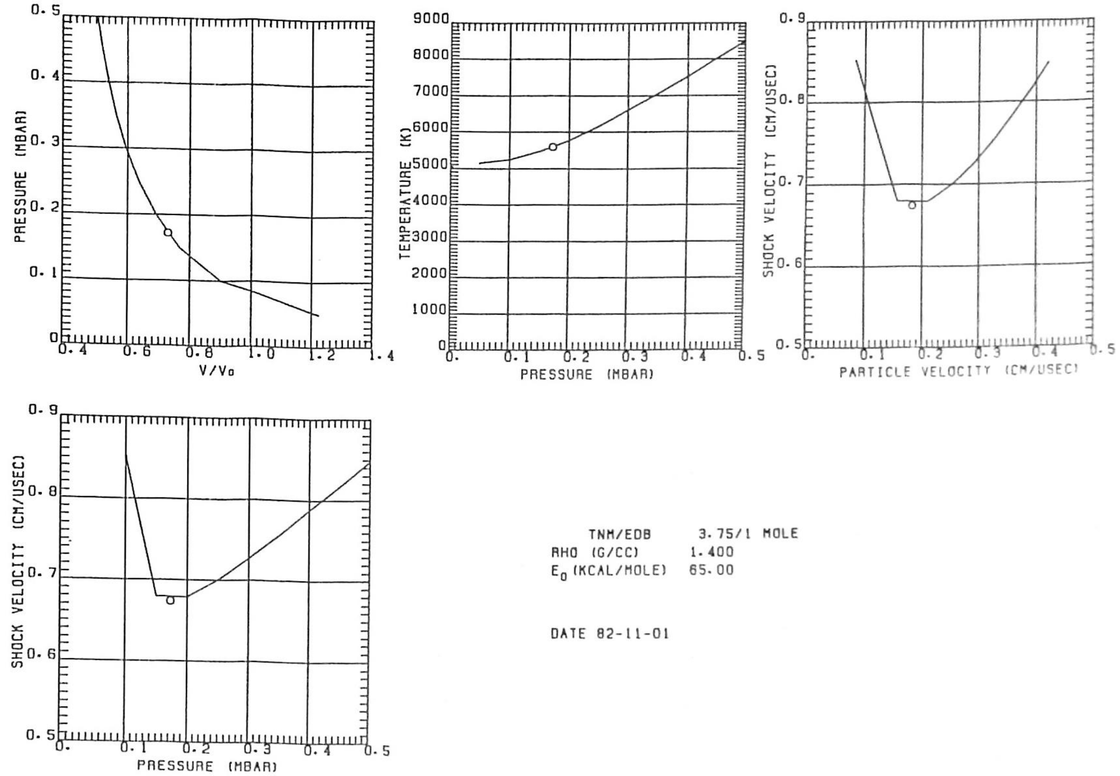
DATE 82-11-01

********** A K-H-T H U G O N I O T <<DATE 82-11-01>>**********

TNM/EDB 3.75/1 MOLE RHO = 1.4000 G/CC, EO = 6.500149E+04 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3594	0.3711	0.3853	0.4027	0.4248	0.4542	0.4931	0.5486	0.6440	0.8741
TEMP	(DEG K)	8500.1	8010.3	7530.9	7062.4	6605.5	6159.9	5768.1	5465.8	5238.4	5138.4
US	(M/SEC)	8478.2	8179.7	7876.2	7570.3	7271.9	7002.6	6792.3	6796.2	8518.9	0.0
UP	(M/SEC)	4212.5	3929.6	3627.5	3302.4	2946.8	2550.0	2103.2	1576.5	838.5	0.0
H2O	(MOLE)	7.9841	7.9902	7.9615	7.8900	7.7514	7.5052	7.3246	7.3213	7.2516	7.0168
CO2	(MOLE)	2.5189	2.4399	2.3473	2.2355	2.0934	1.9088	1.7531	1.6863	1.6403	1.5992
CO	(MOLE)	1.7901	1.9376	2.1490	2.4441	2.8696	3.4911	3.9701	4.0504	4.1049	4.1499
N2	(MOLE)	7.2562	7.2692	7.2780	7.2829	7.2830	7.2771	7.2903	7.3284	7.3578	7.3624
B2O3	(MOLE)	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	4.9999	4.9986	4.9702
HBO2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0027	0.0597
H2	(MOLE)	0.3546	0.3853	0.4336	0.5071	0.6248	0.8192	1.0298	1.1758	1.3533	1.5873
O2	(MOLE)	0.0033	0.0032	0.0031	0.0029	0.0025	0.0021	0.0021	0.0034	0.0066	0.0180
NH3	(MOLE)	0.3911	0.3648	0.3487	0.3424	0.3482	0.3686	0.3420	0.2481	0.1564	0.0753
OH	(MOLE)	0.0850	0.0892	0.0934	0.0975	0.1015	0.1047	0.1175	0.1535	0.2202	0.3693
H	(MOLE)	0.0117	0.0131	0.0151	0.0180	0.0226	0.0300	0.0403	0.0544	0.0790	0.1329
CH4	(MOLE)	0.0132	0.0130	0.0138	0.0157	0.0197	0.0277	0.0268	0.0133	0.0048	0.0010
NO	(MOLE)	0.0965	0.0968	0.0952	0.0917	0.0858	0.0772	0.0774	0.0951	0.1281	0.1999
C(S)	(MOLE)	1.4279	1.3595	1.2398	1.0547	0.7673	0.3224	0.0	0.0	0.0	0.0

K-H-T HUGONIOT



TNM/EDB 3.75/1 MOLE
RHO (G/CC) 1.400
E_0 (KCAL/MOLE) 65.00

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TNM/EDB 4.45/1 MOLE RHO = 1.4270 G/CC EO = 7.116175E+04 CAL/MOLE

LN P = -3.37525845 E+00 -2.15571308 E+00LN V 4.34408903 E-01LN V*2 -8.93642753 E-03LN V*3 -6.91289902 E-02LN V*4

LN T = 8.45576859 E+00 -2.12043762 E-01LN V 7.30608702 E-02LN V*2 -6.44769073 E-02LN V*3 2.82208584 E-02LN V*4

LN E = -1.45063114 E+00 6.08963788 E-01LNP 1.58849597 E-01LN P*2 2.46412642 E-02LN P*3 1.46925892 E-03LN P*4

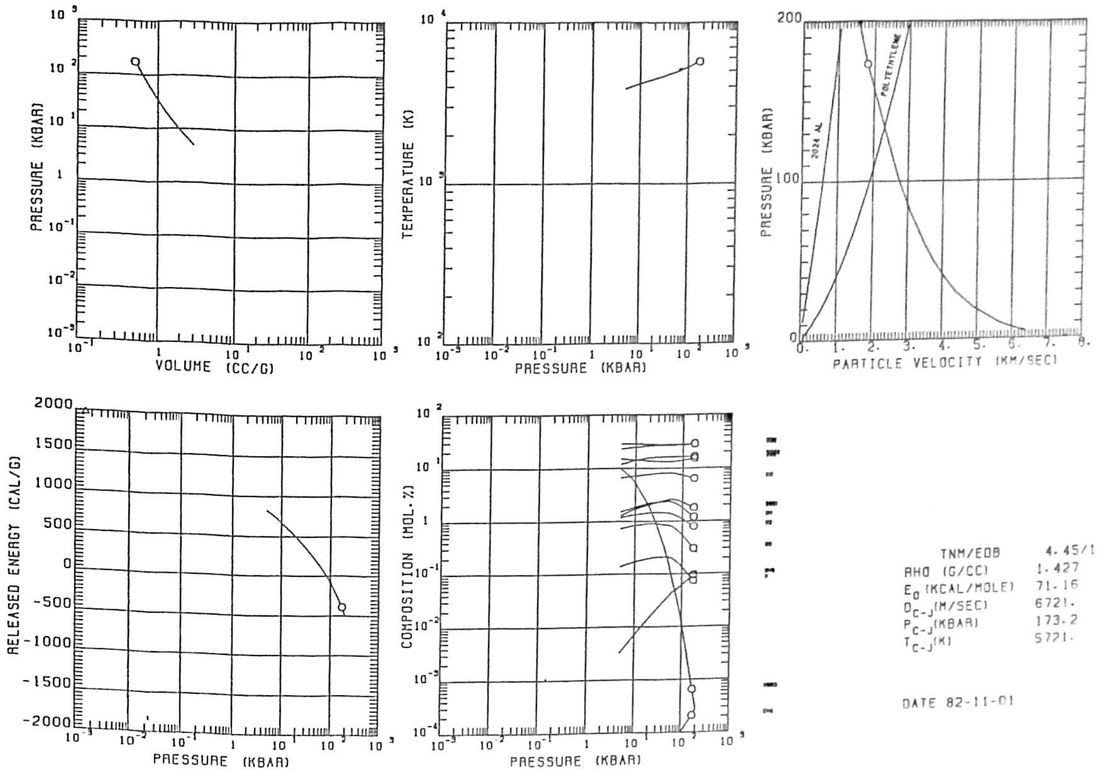
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (199.764)	0.4863	5885.8 (5874.7)	-506.5	0.12119 (0.12098)	2.6924	1540.7
* 173.187 (173.580)	0.5125	5720.5 (5739.2)	-389.8	0.11632 (0.11661)	2.6659	1805.8
100.000 (99.853)	0.6338	5313.5 (5297.5)	-80.2	0.10336 (0.10330)	2.5313	2745.1
80.000 (79.904)	0.6930	5155.3 (5151.6)	23.2	0.09903 (0.09900)	2.4643	3088.1
60.000 (60.016)	0.7801	4969.8 (4984.2)	140.8	0.09411 (0.09411)	2.3689	3503.5
50.000 (50.028)	0.8433	4882.9 (4887.2)	207.7	0.09131 (0.09131)	2.3032	3754.6
40.000 (40.049)	0.9305	4779.0 (4776.4)	283.7	0.08813 (0.08812)	2.2184	4049.2
30.000 (30.027)	1.0632	4647.5 (4642.6)	374.7	0.08432 (0.08432)	2.1027	4413.0
20.000 (19.977)	1.3012	4466.0 (4464.7)	492.3	0.07940 (0.07942)	1.9339	4899.6
10.000 (9.986)	1.9143	4170.4 (4172.4)	670.8	0.07193 (0.07194)	1.6786	5670.2
8.000 (8.005)	2.1887	4081.1 (4081.2)	722.6	0.06977 (0.06975)	1.6245	5903.0
6.000 (6.011)	2.6170	3969.9 (3968.6)	785.9	0.06712 (0.06711)	1.5909	6194.6
5.000 (4.994)	2.9399	3901.9 (3902.5)	823.9	0.06553 (0.06554)	1.5967	6375.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

K-H-T ISENTROPE THRU C-J POINT



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES		TFDN 0.75 # EDB 0.1
RHO	(G/CC)	1.470
EO	(KCAL/MOLE)	-129.00
MOL.WEIGHT	(G)	159.048
C		1.7000
F		3.0000
N		1.5000
O		3.0000
H		1.8000
B		1.0000
DETN.VEL	(M/SEC)	6881.5
PARTICL.VEL(")		1920.0
C-J PRESS	(KBAR)	194.2
C-J VOLUME	(CC/G)	0.49047
C-J TEMP	(DEG K)	4940.9
C-J S(CAL/DEG MOL)		59.49
C-J ENERGY	(CAL/G)	440.53
GAMMA		2.584
C-J DETN.HEAT(CAL)		1486.7
LAMDA		10.0732
VOLUM(K LITTRE/KG)		0.7264
TOTAL PRODCT(MOLE)		4.9541
V GAS	(MOLES)	4.7221
V GAS	(CC/MOLE)	16.3356
V SOL C(S)	(CC/G)	0.31238

H2O	(MOL %)	0.0479
CO2	(MOL %)	12.3520
CO	(MOL %)	17.2011
N2	(MOL %)	15.0001
B2O3	(MOL %)	6.0934
BF3	(MOL %)	7.9986
HBO2	(MOL %)	0.0000
CF4	(MOL %)	0.0775
H2	(MOL %)	0.0038
O2	(MOL %)	0.0132
NH3	(MOL %)	0.0000
OH	(MOL %)	0.0183
H	(MOL %)	0.0039
CH4	(MOL %)	0.0000
NO	(MOL %)	0.2776
HF	(MOL %)	36.2080
F2	(MOL %)	0.0209
C(S)	(MOL %)	4.6835

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TNM/EDB 4.45/1 MOLE RHO = 1.4270 G/CC EO = 7.116175E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O C(S)	CO2	CO	N2	B2O3	HBO2	H2	O2	NH3	OH	H	CH4	NO
173.187	8.52957 0.0	4.54053	1.90948	8.61639	4.99990	0.00019	0.23609	0.09117	0.02885	0.35910	0.02258	0.00006	0.53834
100.000	8.35004 0.0	4.23614	2.21384	8.54630	4.99820	0.00360	0.32919	0.16586	0.01859	0.54153	0.04054	0.00003	0.68880
80.000	8.26386 0.0	4.11147	2.33851	8.51934	4.99532	0.00936	0.37140	0.20131	0.01598	0.62205	0.05006	0.00002	0.74533
60.000	8.16053 0.0	3.98822	2.46177	8.49728	4.98607	0.02785	0.42074	0.24315	0.01306	0.70867	0.06171	0.00001	0.79238
50.000	8.13683 0.0	3.99747	2.45252	8.50944	4.97331	0.05339	0.43197	0.25286	0.01095	0.71314	0.06299	0.00001	0.77015
40.000	8.10365 0.0	4.01734	2.43265	8.52570	4.94602	0.10796	0.44153	0.26193	0.00884	0.71142	0.06371	0.00001	0.73975
30.000	8.04463 0.0	4.05557	2.39443	8.54867	4.88229	0.23541	0.44692	0.26902	0.00669	0.69810	0.06331	0.00000	0.69596
20.000	7.90868 0.0	4.13046	2.31954	8.58402	4.71660	0.56680	0.44110	0.27006	0.00445	0.65984	0.06043	0.00000	0.62749
10.000	7.49863 0.0	4.29220	2.15780	8.64635	4.21111	1.57777	0.40321	0.25232	0.00212	0.56048	0.05172	0.00000	0.50517
8.000	7.33161 0.0	4.34743	2.10257	8.66542	4.00794	1.98412	0.38700	0.24314	0.00166	0.52512	0.04857	0.00000	0.46749
6.000	7.10824 0.0	4.41966	2.03034	8.68899	3.73711	2.52579	0.36515	0.22952	0.00120	0.47936	0.04450	0.00000	0.42081
5.000	6.96756 0.0	4.46550	1.98457	8.70323	3.56677	2.86646	0.35131	0.22009	0.00098	0.45092	0.04197	0.00000	0.39254
200.000	8.56499 0.0	4.61588	1.83411	8.63419	4.99996	0.00009	0.21638	0.07607	0.03307	0.31842	0.01922	0.00008	0.49853

PRESS ;KBAR, PRODUCTS ;MOLES

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TFDN 0.75 EDB 0.1 RHO = 1.4700 G/CC EO = -1.290000E+05 CAL/MOLE

P = -3.38543797 E+00 -2.20755768 E+00LN V 2.85406113 E-01LN V**2 -3.39774080 E-02LN V**3 1.47528760 E-03LN V**4

T = 8.25475979 E+00 -3.06306124 E-01LN V 8.29200745 E-02LN V**2 -1.75833628 E-02LN V**3 1.21059315 E-03LN V**4

E = -1.52095222 E+00 4.65414941 E-01LNP 7.01100230 E-02LN P**2 5.59311733 E-03LN P**3 1.64828569 E-04LN P**4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

E CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (420.077)	0.3692	6317.3 (5772.7)	-1301.7	0.15446 (0.15066)	2.8834	340.3
300.000 (302.760)	0.4143	5681.5 (5441.2)	-890.1	0.13724 (0.13682)	2.7936	1022.7
200.000 (196.787)	0.4851	4982.3 (5048.1)	-466.0	0.11950 (0.12116)	2.6761	1864.1
* 194.224 (191.090)	0.4904	4940.9 (5022.9)	-440.7	0.11844 (0.12018)	2.6681	1920.0
100.000 (97.722)	0.6362	4227.5 (4500.3)	-9.3	0.10039 (0.10182)	2.4871	3074.7
80.000 (78.602)	0.6952	4117.1 (4350.1)	90.7	0.09621 (0.09704)	2.4289	3410.0
60.000 (59.236)	0.7825	3985.3 (4167.8)	207.2	0.09133 (0.09166)	2.3538	3820.4
50.000 (49.461)	0.8454	3909.6 (4058.7)	274.5	0.08852 (0.08865)	2.3063	4068.3
40.000 (39.664)	0.9315	3826.7 (3932.1)	349.1	0.08539 (0.08531)	2.2486	4358.3
30.000 (29.870)	1.0589	3729.2 (3780.0)	434.7	0.08181 (0.08150)	2.1752	4710.8
20.000 (20.059)	1.2773	3598.4 (3585.0)	539.1	0.07745 (0.07692)	2.0739	5171.8
10.000 (10.121)	1.8019	3371.2 (3293.5)	686.1	0.07129 (0.07069)	1.9056	5884.6
8.000 (8.104)	2.0282	3294.8 (3209.0)	727.7	0.06955 (0.06900)	1.8528	6098.0
6.000 (6.073)	2.3767	3197.8 (3105.7)	776.9	0.06749 (0.06700)	1.7860	6363.3
5.000 (5.058)	2.6363	3134.8 (3043.6)	806.7	0.06625 (0.06583)	1.7446	6525.6
4.000 (4.040)	3.0044	3059.3 (2970.6)	840.9	0.06481 (0.06447)	1.6951	6718.9
3.000 (3.023)	3.5761	2962.6 (2881.0)	882.5	0.06308 (0.06282)	1.6335	6959.3
2.000 (2.011)	4.6201	2828.0 (2762.3)	936.9	0.06080 (0.06068)	1.5516	7282.6
1.000 (1.003)	7.3757	2600.7 (2572.9)	1021.9	0.05724 (0.05734)	1.4269	7801.1
0.800 (0.801)	8.6501	2529.4 (2513.7)	1047.3	0.05618 (0.05633)	1.3912	7961.2
0.600 (0.600)	10.6904	2438.3 (2437.6)	1079.1	0.05485 (0.05505)	1.3488	8163.5
0.500 (0.499)	12.2650	2380.1 (2389.4)	1099.0	0.05402 (0.05426)	1.3242	8289.2
0.400 (0.398)	14.5681	2310.7 (2329.9)	1122.6	0.05303 (0.05331)	1.2965	8441.2
0.300 (0.298)	18.2801	2222.7 (2252.4)	1152.2	0.05179 (0.05209)	1.2648	8633.8
0.200 (0.198)	25.3694	2102.0 (2141.3)	1192.5	0.05010 (0.05042)	1.2281	8898.2
0.100 (0.099)	45.0378	1906.2 (1947.8)	1257.7	0.04738 (0.04764)	1.1862	9331.5
0.080 (0.079)	54.3582	1848.6 (1884.9)	1276.9	0.04657 (0.04678)	1.1777	9467.0
0.060 (0.060)	69.3072	1775.7 (1804.3)	1301.3	0.04555 (0.04568)	1.1700	9638.1
0.050 (0.050)	80.8590	1730.6 (1753.9)	1316.4	0.04492 (0.04500)	1.1668	9744.6
0.040 (0.040)	97.7262	1677.6 (1693.0)	1334.2	0.04418 (0.04419)	1.1645	9873.5
0.030 (0.030)	124.8203	1611.7 (1616.3)	1356.4	0.04325 (0.04317)	1.1636	10036.8
0.020 (0.020)	176.3300	1523.3 (1513.4)	1386.1	0.04200 (0.04181)	1.1655	10262.0
0.010 (0.010)	318.4502	1382.5 (1357.3)	1433.5	0.04002 (0.03973)	1.1739	10633.4
0.008 (0.008)	385.4727	1340.7 (1313.6)	1447.5	0.03944 (0.03914)	1.1769	10749.8
0.006 (0.006)	492.9238	1288.0 (1263.0)	1465.1	0.03870 (0.03845)	1.1804	10896.9
0.005 (0.005)	575.9683	1255.4 (1234.6)	1475.9	0.03825 (0.03805)	1.1821	10988.4
0.004 (0.004)	697.0601	1216.9 (1204.0)	1488.7	0.03771 (0.03761)	1.1836	11099.0
0.003 (0.003)	891.5042	1168.9 (1171.9)	1504.6	0.03705 (0.03713)	1.1839	11238.8
0.002 (0.002)	1259.1697	1102.5 (1142.6)	1526.3	0.03614 (0.03664)	1.1805	11429.6

C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

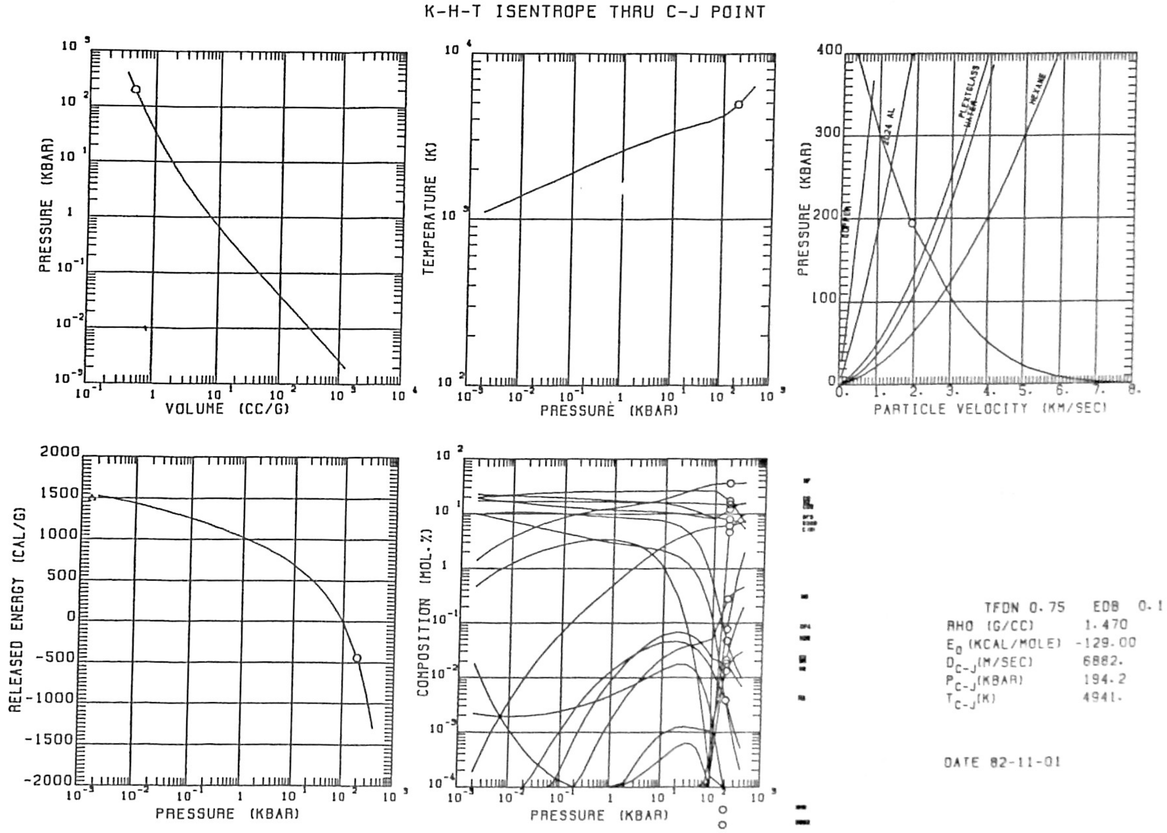
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TFDN 0.75 EDB 0.1 RHO = 1.4700 G/CC EO = -1.290000E+05 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

S	H2O / CH4	CO2 / NO	CO / HF	N2 / F2	B2O3 / C(S)	BF3	HBO2	CF4	H2	O2	NH3	OH	H
224	0.00237	0.61228	0.85143	0.74312	0.30189	0.39624	0.00000	0.00385	0.00019	0.00066	0.00000	0.00090	0.00019
	0.00000	0.01377	1.79380	0.00104	0.23241								
000	0.02391	0.40274	1.29723	0.74867	0.28987	0.42028	0.00001	0.00002	0.00547	0.00005	0.00011	0.00112	0.00070
	0.00000	0.00255	1.73906	0.00001	0.0								
000	0.04595	0.40874	1.29125	0.74870	0.28043	0.43910	0.00004	0.00001	0.01108	0.00005	0.00022	0.00154	0.00098
	0.00001	0.00237	1.68268	0.00000	0.0								
000	0.08846	0.42049	1.27949	0.74870	0.26212	0.47554	0.00021	0.00000	0.02233	0.00006	0.00044	0.00208	0.00135
	0.00002	0.00215	1.57337	0.00000	0.0								
000	0.12143	0.42966	1.27031	0.74869	0.24778	0.50389	0.00054	0.00000	0.03124	0.00006	0.00058	0.00240	0.00156
	0.00003	0.00203	1.48831	0.00000	0.0								
000	0.16373	0.44152	1.25845	0.74868	0.22905	0.54046	0.00146	0.00000	0.04282	0.00006	0.00073	0.00274	0.00178
	0.00003	0.00191	1.37864	0.00000	0.0								
000	0.21561	0.45621	1.24376	0.74870	0.20495	0.58588	0.00421	0.00000	0.05728	0.00006	0.00082	0.00306	0.00200
	0.00003	0.00177	1.24236	0.00000	0.0								
000	0.27584	0.47386	1.22612	0.74882	0.17301	0.64078	0.01322	0.00000	0.07476	0.00006	0.00082	0.00323	0.00216
	0.00002	0.00154	1.07767	0.00000	0.0								
000	0.33897	0.49512	1.20488	0.74916	0.12284	0.70758	0.04676	0.00000	0.09562	0.00004	0.00064	0.00279	0.00205
	0.00001	0.00105	0.87727	0.00000	0.0								
000	0.35076	0.50011	1.19986	0.74927	0.10777	0.72328	0.06121	0.00000	0.10045	0.00003	0.00058	0.00251	0.00193
	0.00001	0.00088	0.83018	0.00000	0.0								
000	0.36140	0.50550	1.19447	0.74941	0.08977	0.74001	0.08047	0.00000	0.10568	0.00003	0.00050	0.00214	0.00176
	0.00001	0.00069	0.78000	0.00000	0.0								
000	0.36658	0.50861	1.19139	0.74949	0.07924	0.74924	0.09230	0.00000	0.10870	0.00002	0.00045	0.00189	0.00163
	0.00001	0.00058	0.75230	0.00000	0.0								
000	0.37140	0.51207	1.18791	0.74957	0.06757	0.75904	0.10587	0.00000	0.11206	0.00002	0.00040	0.00161	0.00147
	0.00001	0.00046	0.72293	0.00000	0.0								
000	0.37634	0.51638	1.18361	0.74966	0.05446	0.76996	0.12114	0.00000	0.11621	0.00001	0.00035	0.00127	0.00127
	0.00001	0.00033	0.69016	0.00000	0.0								
000	0.38235	0.52241	1.17758	0.74976	0.03961	0.78312	0.13766	0.00000	0.12212	0.00001	0.00029	0.00088	0.00101
	0.00001	0.00020	0.65070	0.00000	0.0								
800	0.39361	0.53399	1.16603	0.74986	0.02248	0.80282	0.15222	0.00000	0.13364	0.00000	0.00021	0.00041	0.00061
	0.00000	0.00007	0.59161	0.00000	0.0								
600	0.39770	0.53822	1.16176	0.74988	0.01874	0.80877	0.15376	0.00000	0.13785	0.00000	0.00020	0.00031	0.00051
	0.00000	0.00005	0.57376	0.00000	0.0								
500	0.40349	0.54416	1.15584	0.74990	0.01482	0.81654	0.15383	0.00000	0.14380	0.00000	0.00018	0.00021	0.00040
	0.00000	0.00003	0.55045	0.00000	0.0								
400	0.40769	0.54833	1.15169	0.74991	0.01273	0.82175	0.15279	0.00000	0.14801	0.00000	0.00017	0.00016	0.00033
	0.00000	0.00002	0.53482	0.00000	0.0								
300	0.41289	0.55372	1.14630	0.74992	0.01059	0.82809	0.15073	0.00000	0.15341	0.00000	0.00015	0.00011	0.00026
	0.00000	0.00001	0.51582	0.00000	0.0								
200	0.41998	0.56129	1.13875	0.74993	0.00833	0.83653	0.14682	0.00000	0.16104	0.00000	0.00014	0.00007	0.00019
	0.00000	0.00001	0.49049	0.00000	0.0								
100	0.43057	0.57340	1.12659	0.74994	0.00585	0.84907	0.13923	0.00000	0.17310	0.00000	0.00013	0.00004	0.00012
	0.00000	0.00000	0.45288	0.00000	0.0								
080	0.44901	0.59801	1.10201	0.74995	0.00302	0.87201	0.12196	0.00000	0.19774	0.00000	0.00011	0.00001	0.00005
	0.00001	0.00000	0.38409	0.00000	0.0								
060	0.45416	0.60665	1.09335	0.74995	0.00242	0.87920	0.11597	0.00000	0.20639	0.00000	0.00010	0.00001	0.00003
	0.00001	0.00000	0.36253	0.00000	0.0								
040	0.46057	0.61876	1.08124	0.74995	0.00178	0.88877	0.10768	0.00000	0.21849	0.00000	0.00010	0.00000	0.00002
	0.00001	0.00000	0.31534	0.00000	0.0								
040	0.46828	0.63738	1.06264	0.74995	0.00111	0.90227	0.09551	0.00000	0.23712	0.00000	0.00009	0.00000	0.00001
	0.00001	0.00000	0.29334	0.00000	0.0								
030	0.47241	0.65157	1.04845	0.74996	0.00078	0.91161	0.08683	0.00000	0.25134	0.00000	0.00009	0.00000	0.00001
	0.00001	0.00000	0.26532	0.00000	0.0								
020	0.47604	0.67319	1.02682	0.74996	0.00046	0.92438	0.07470	0.00000	0.27291	0.00000	0.00009	0.00000	0.00000
	0.00002	0.00000	0.22702	0.00000	0.0								
010	0.47487	0.71483	0.98512	0.74996	0.00017	0.94472	0.05495	0.00000	0.31446	0.00000	0.00009	0.00000	0.00000
	0.00005	0.00000	0.16603	0.00000	0.0								
008	0.47208	0.72921	0.97073	0.74996	0.00012	0.95053	0.04923	0.00000	0.32876	0.00000	0.00008	0.00000	0.00000
	0.00007	0.00000	0.14859	0.00000	0.0								
006	0.46667	0.74891	0.95099	0.74996	0.00007	0.95768	0.04218	0.00000	0.34833	0.00000	0.00009	0.00000	0.00000
	0.00010	0.00000	0.12716	0.00000	0.0								
005	0.46208	0.76200	0.93791	0.74996	0.00005	0.96194	0.03796	0.00000	0.36135	0.00000	0.00009	0.00000	0.00000
	0.00014	0.00000	0.11438	0.00000	0.0								
004	0.45525	0.77853	0.92133	0.74996	0.00003	0.96677	0.03316	0.00000	0.37769	0.00000	0.00009	0.00000	0.00000
	0.00020	0.00000	0.09992	0.00000	0.0								
003	0.44438	0.80085	0.89886	0.74996	0.00002	0.97243	0.02753	0.00000	0.39961	0.00000	0.00009	0.00000	0.00000
	0.00033	0.00000	0.08293	0.00000	0.0								
002	0.42458	0.83532	0.86395	0.74996	0.00001	0.97954	0.02045	0.00000	0.43271	0.00000	0.00010	0.00000	0.00000
	0.00077	0.00000	0.06163	0.00000	0.0								
200.000	0.00213	0.62009	0.83228	0.74255	0.30271	0.39455	0.00000	0.00485	0.00016	0.00074	0.00000	0.00090	0.00018
	0.00000	0.01490	1.79434	0.00131	0.24274								
300.000	0.00082	0.74841	0.50437	0.73994	0.32497	0.35007	0.00000	0.03556	0.00003	0.00124	0.00000	0.00051	0.00005
	0.00000	0.02013	1.79779	0.00488	0.41164								
400.000	0.00048	0.76567	0.34018	0.73884	0.36748	0.26501	0.00000	0.09678	0.00001	0.00146	0.00000	0.00034	0.00002
	0.00000	0.02232	1.79868	0.00958	0.49738								

PRESS ;KBAR, PRODUCTS ;MOLES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	1,2DP; DIFLU# OROAMINOPROP
RHO (G/CC)	1.256
EO (KCAL/MOLE)	-39.30
MOL.WEIGHT (G)	146.088
C	3.0000
H	6.0000
N	2.0000
F	4.0000
DETN.VEL (M/SEC)	5975.6
PARTICL.VEL(")	1614.3
C-J PRESS (KBAR)	121.2
C-J VOLUME (CC/G)	0.58109
C-J TEMP (DEG K)	4312.1
C-J S(CAL/DEG MOL)	50.21
C-J ENERGY (CAL/G)	311.42
GAMMA	2.702
C-J DETN.HEAT(CAL)	1524.0
LAMDA	4.7938
VOLUM(K LITTRE/KG)	0.9785
TOTAL PRODCT(MOLE)	8.8174
V GAS (MOLES)	5.8427
V GAS (CC/MOLE)	12.3912
V SOL C(S) (CC/G)	0.34967
N2 (MOL %)	10.5610
CF4 (MOL %)	0.0000
H2 (MOL %)	8.3631
NH3 (MOL %)	1.5603
H (MOL %)	0.1272
CH4 (MOL %)	0.2869
HF (MOL %)	45.3649
F2 (MOL %)	0.0000
C(S) (MOL %)	33.7366

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

1,2DP; DIFLUOROAMINOPROP RHO = 1.2560 G/CC EO = -3.930000E+04 CAL/MOLE

LN P = -3.41959000 E+00 -2.18612671 E+00LN V 3.56239974 E-01LN V*2 -5.60437888 E-02LN V*3 3.15501657 E-03LN V*4

LN T = 8.22468662 E+00 -2.94116318 E-01LN V 5.09052537 E-02LN V*2 -1.12752058 E-02LN V*3 7.99838454 E-04LN V*4

LN E = -1.56975460 E+00 3.71289074 E-01LNP 5.27734049 E-02LN P*2 4.39297035 E-03LN P*3 1.37401556 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
300.000 (299.146)	0.4186	5404.1 (5050.9)	-1129.3	0.14725 (0.14261)	2.9424	0.0
200.000 (196.608)	0.4846	4794.6 (4764.8)	-681.9	0.12853 (0.12899)	2.7954	741.9
* 121.159 (120.165)	0.5811	4312.1 (4452.3)	-311.3	0.11302 (0.11568)	2.6244	1614.3
100.000 (99.252)	0.6257	4221.4 (4337.3)	-224.4	0.10939 (0.11140)	2.5585	1919.1
80.000 (79.743)	0.6824	4116.2 (4209.8)	-131.0	0.10548 (0.10688)	2.4837	2251.4
60.000 (60.295)	0.7654	3985.5 (4052.9)	-23.2	0.10097 (0.10169)	2.3889	2652.4
50.000 (50.538)	0.8248	3903.2 (3957.2)	39.7	0.09834 (0.09872)	2.3296	2893.1
40.000 (40.682)	0.9067	3805.4 (3843.0)	110.6	0.09537 (0.09538)	2.2575	3176.7
30.000 (30.248)	1.0369	3680.4 (3692.6)	193.4	0.09191 (0.09150)	2.1605	3544.4
20.000 (20.346)	1.2528	3505.7 (3501.2)	301.2	0.08740 (0.08669)	2.0339	4004.8
10.000 (10.132)	1.7996	3210.4 (3188.3)	462.6	0.08064 (0.07985)	1.8230	4741.6
8.000 (8.071)	2.0434	3119.4 (3092.1)	508.7	0.07872 (0.07793)	1.7582	4965.4
6.000 (6.019)	2.4238	3003.0 (2971.6)	565.3	0.07635 (0.07561)	1.6784	5244.1
5.000 (5.001)	2.7113	2929.4 (2897.4)	600.1	0.07489 (0.07423)	1.6302	5415.0
4.000 (3.985)	3.1242	2841.3 (2808.4)	640.6	0.07320 (0.07261)	1.5740	5619.4
3.000 (2.976)	3.7769	2729.0 (2696.7)	690.8	0.07110 (0.07062)	1.5066	5875.3
2.000 (1.974)	4.9994	2572.0 (2544.2)	758.4	0.06827 (0.06799)	1.4224	6223.2
1.000 (0.985)	8.3263	2305.5 (2295.7)	867.6	0.06370 (0.06383)	1.3112	6787.0
0.800 (0.787)	9.8981	2226.4 (2217.7)	899.0	0.06239 (0.06257)	1.2844	6963.1
0.600 (0.591)	12.3976	2122.5 (2119.9)	939.5	0.06069 (0.06098)	1.2567	7183.7
0.500 (0.494)	14.3194	2057.6 (2059.1)	964.6	0.05964 (0.06000)	1.2429	7320.4
0.400 (0.396)	17.1121	1980.7 (1985.8)	994.0	0.05841 (0.05882)	1.2297	7485.2
0.300 (0.299)	21.5340	1881.7 (1893.9)	1031.6	0.05684 (0.05733)	1.2183	7691.9
0.200 (0.201)	29.9305	1754.6 (1767.1)	1079.1	0.05485 (0.05530)	1.2113	7978.0
0.100 (0.102)	52.4860	1548.4 (1563.4)	1155.3	0.05166 (0.05202)	1.2176	8443.4
0.080 (0.081)	62.9405	1487.7 (1501.1)	1177.4	0.05074 (0.05101)	1.2227	8588.4
0.060 (0.061)	79.5435	1412.8 (1423.4)	1204.7	0.04959 (0.04976)	1.2304	8771.5
0.050 (0.051)	92.2677	1367.3 (1375.9)	1221.3	0.04890 (0.04899)	1.2355	8885.3
0.040 (0.041)	110.6460	1313.6 (1319.6)	1240.8	0.04809 (0.04808)	1.2414	9022.2
0.030 (0.030)	139.8484	1247.8 (1250.1)	1264.7	0.04708 (0.04696)	1.2481	9194.9
0.020 (0.020)	194.5890	1161.4 (1158.6)	1296.4	0.04576 (0.04549)	1.2537	9430.6
0.010 (0.010)	362.6550	1038.8 (1031.9)	1340.5	0.04426 (0.04369)	1.2618	9813.3

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

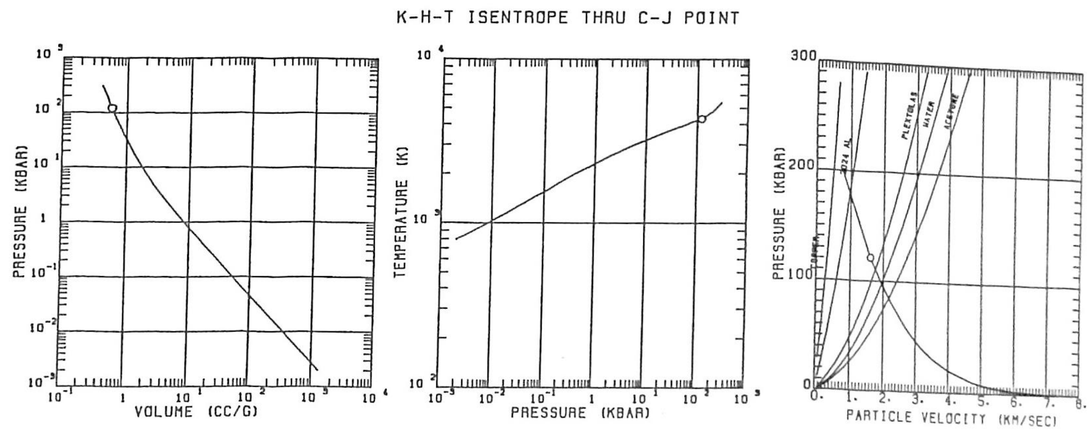
1,2DP; DIFLUOROAMINOPROP RHO = 1.2560 G/CC EO = -3.930000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	N2	CF4	H2	NH3	H	CH4	HF	F2	C(S)
121.159	0.93125	0.00000	0.73750	0.13749	0.01122	0.02532	4.00003	0.00000	2.97468
100.000	0.94291	0.00000	0.76146	0.11419	0.01109	0.03086	4.00002	0.00000	2.96915
80.000	0.95391	0.00000	0.78155	0.09219	0.01074	0.03739	4.00002	0.00000	2.96261
60.000	0.96481	0.00000	0.79846	0.07039	0.01012	0.04544	4.00001	0.00000	2.95456
50.000	0.97017	0.00000	0.80552	0.05966	0.00962	0.05009	4.00001	0.00000	2.94991
40.000	0.97550	0.00000	0.81182	0.04901	0.00897	0.05509	4.00001	0.00000	2.94491
30.000	0.98072	0.00000	0.81913	0.03856	0.00806	0.05950	4.00000	0.00000	2.94050
20.000	0.98602	0.00000	0.82526	0.02797	0.00671	0.06472	4.00000	0.00000	2.93528
10.000	0.99146	0.00000	0.83632	0.01708	0.00446	0.06791	4.00000	0.00000	2.93209
8.000	0.99262	0.00000	0.84033	0.01476	0.00384	0.06780	4.00000	0.00000	2.93220
6.000	0.99384	0.00000	0.84560	0.01232	0.00311	0.06718	4.00001	0.00000	2.93282
5.000	0.99448	0.00000	0.84888	0.01104	0.00268	0.06661	4.00001	0.00000	2.93339
4.000	0.99516	0.00000	0.85305	0.00969	0.00221	0.06565	4.00001	0.00000	2.93435
3.000	0.99588	0.00000	0.85843	0.00823	0.00169	0.06418	4.00001	0.00000	2.93581
2.000	0.99669	0.00000	0.86573	0.00662	0.00110	0.06189	4.00002	0.00000	2.93811
1.000	0.99766	0.00000	0.87575	0.00468	0.00045	0.05850	4.00003	0.00000	2.94151
0.800	0.99790	0.00000	0.87896	0.00420	0.00033	0.05728	4.00003	0.00000	2.94272
0.600	0.99816	0.00000	0.88151	0.00369	0.00021	0.05642	4.00004	0.00000	2.94359
0.500	0.99829	0.00000	0.88241	0.00341	0.00015	0.05619	4.00004	0.00000	2.94382
0.400	0.99844	0.00000	0.88304	0.00311	0.00010	0.05611	4.00005	0.00000	2.94389
0.300	0.99860	0.00000	0.88182	0.00279	0.00006	0.05697	4.00006	0.00000	2.94303
0.200	0.99880	0.00000	0.87927	0.00241	0.00002	0.05854	4.00006	0.00000	2.94147
0.100	0.99902	0.00000	0.86403	0.00196	0.00000	0.06649	4.00008	0.00000	2.93352
0.080	0.99907	0.00000	0.85668	0.00186	0.00000	0.07025	4.00009	0.00000	2.92976
0.060	0.99913	0.00000	0.84469	0.00174	0.00000	0.07633	4.00010	0.00000	2.92368
0.050	0.99916	0.00000	0.83554	0.00167	0.00000	0.08095	4.00010	0.00000	2.91906
0.040	0.99920	0.00000	0.82252	0.00160	0.00000	0.08751	4.00011	0.00000	2.91250
0.030	0.99924	0.00000	0.80250	0.00152	0.00000	0.09758	4.00012	0.00000	2.90243
0.020	0.99929	0.00000	0.76756	0.00142	0.00000	0.11512	4.00014	0.00000	2.88489
0.010	0.99937	0.00000	0.68843	0.00126	0.00000	0.15480	4.00016	0.00000	2.84522
0.008	0.99939	0.00000	0.65812	0.00121	0.00000	0.16999	4.00017	0.00000	2.83003
0.006	0.99943	0.00000	0.61563	0.00115	0.00000	0.19128	4.00018	0.00000	2.80874
0.005	0.99945	0.00000	0.58707	0.00110	0.00000	0.20559	4.00019	0.00000	2.79443
0.004	0.99947	0.00000	0.55072	0.00105	0.00000	0.22381	4.00020	0.00000	2.77621
0.003	0.99951	0.00000	0.50208	0.00098	0.00000	0.24818	4.00021	0.00000	2.75184
0.002	0.99956	0.00000	0.43323	0.00087	0.00000	0.28268	4.00022	0.00000	2.71735
200.000	0.89595	0.00000	0.65281	0.20810	0.01483	0.01380	4.00004	0.00000	2.98621
300.000	0.85757	0.00000	0.54767	0.28486	0.01316	0.00922	4.00004	0.00000	2.99079

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



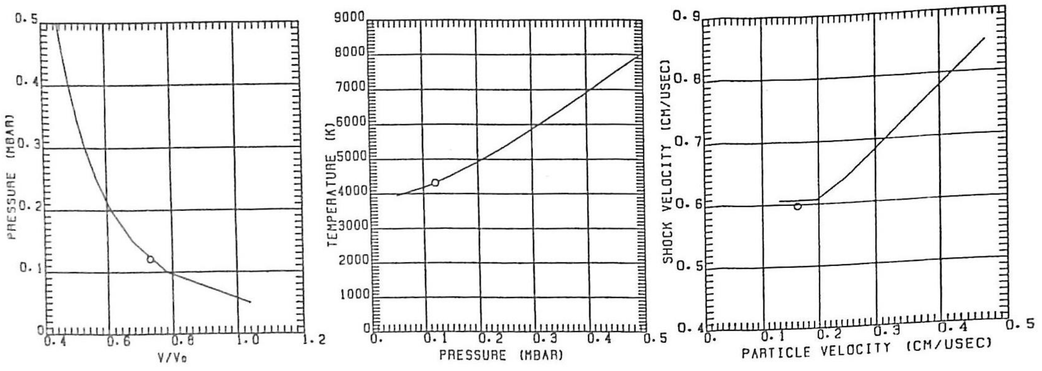
1,2DP; DIFLUOROAMINOPROP	
RHO (G/CC)	1.256
E_0 (KCAL/MOLE)	-39.30
D_{C-J}(M/SEC)	5976.
P_{C-J}(KBAR)	121.2
T_{C-J}(K)	4312.

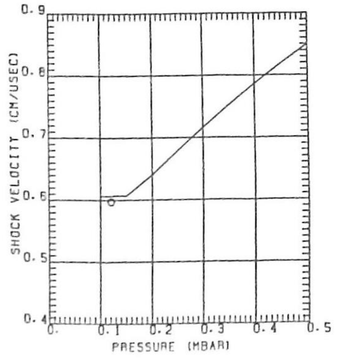
********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

1,2DP; DIFLUORODAMINOPROP RHO = 1.2560 G/CC, EO = -3.930000E+04 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3574	0.3710	0.3862	0.4040	0.4253	0.4520	0.4873	0.5382	0.6241	0.8279
TEMP	(DEG K)	8037.4	7460.5	6904.1	6368.9	5857.0	5372.1	4921.8	4518.9	4177.7	3952.2
US	(M/SEC)	8499.0	8190.4	7864.8	7521.4	7160.6	6785.3	6407.1	6071.6	6068.8	0.0
UP	(M/SEC)	4683.9	4374.4	4049.3	3704.9	3335.6	2933.5	2485.3	1967.0	1311.9	0.0
N2	(MOLE)	0.8155	0.8254	0.8366	0.8494	0.8639	0.8807	0.8994	0.9181	0.9421	0.9707
CF4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	(MOLE)	0.4153	0.4458	0.4797	0.5176	0.5603	0.6086	0.6607	0.7077	0.7595	0.8073
NH3	(MOLE)	0.3690	0.3492	0.3268	0.3013	0.2721	0.2385	0.2012	0.1639	0.1159	0.0587
H	(MOLE)	0.0088	0.0097	0.0107	0.0120	0.0137	0.0160	0.0175	0.0130	0.0103	0.0105
CH4	(MOLE)	0.0134	0.0128	0.0124	0.0122	0.0123	0.0128	0.0144	0.0200	0.0308	0.0497
HF	(MOLE)	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
F2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S)	(MOLE)	2.9866	2.9872	2.9876	2.9878	2.9877	2.9872	2.9856	2.9800	2.9693	2.9503

K-H-T HUGONIOT





1,2DP: DIFLUORODAMINOPROP
RHO (G/CC) 1.256
E_0 (KCAL/MOLE) -39.30

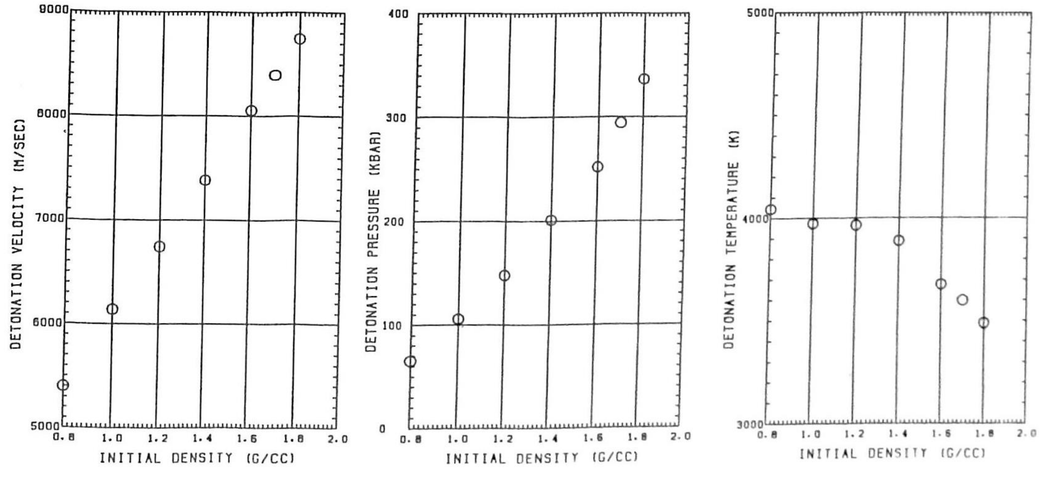
DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES		RDX	# RDX	# RDX	# RDX	# RDX	# RDX	# RDX	#
RHO	(G/CC)	1.800	1.700	1.600	1.400	1.200	1.000	0.800	
EO	(KCAL/MOLE)	16.90	16.90	16.90	16.90	16.90	16.90	16.90	
MOL.WEIGHT	(G)	222.118	222.118	222.118	222.118	222.118	222.118	222.118	
C		3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
H		6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
N		6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
O		6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
DETN.VEL	(M/SEC)	8743.3	8396.5	8057.5	7382.8	6744.2	6140.0	5398.5	
PARTICL.VEL(	")	2136.8	2062.7	1953.3	1945.3	1826.6	1724.0	1509.7	
C-J PRESS	(KBAR)	336.3	294.4	251.8	201.1	147.8	105.9	65.2	
C-J VOLUME	(CC/G)	0.41978	0.44373	0.47349	0.52608	0.60763	0.71922	0.90044	
C-J TEMP	(DEG K)	3487.8	3597.7	3675.3	3887.4	3964.4	3972.3	4045.2	
C-J S	(CAL/DEG MOL)	53.41	53.95	54.32	54.76	54.13	52.57	52.17	
C-J ENERGY	(CAL/G)	545.63	508.45	455.96	452.23	398.73	355.19	272.37	
GAMMA		3.092	3.071	3.125	2.795	2.692	2.561	2.576	
C-J DETN.HEAT	(CAL)	1482.2	1476.7	1467.5	1436.1	1377.4	1288.4	1240.3	
LAMDA		9.1450	9.1344	9.1161	9.0565	8.9522	8.8202	8.7079	
VOLUM	(K LITTRE/KG)	0.8294	0.8325	0.8381	0.8566	0.8933	0.9508	0.9841	
TOTAL PRODCT	(MOLE)	9.0031	9.0009	8.9966	8.9847	8.9555	8.8987	8.9349	
V GAS	(MOLES)	7.5299	7.5584	7.6091	7.7767	8.1100	8.6324	8.9349	
V GAS	(CC/MOLE)	11.8132	12.4431	13.2102	14.4593	16.2264	18.3736	22.3846	
V SOL C(S)	(CC/G)	0.24240	0.26032	0.27915	0.30371	0.33184	0.35721	0.38731	
H2O	(MOL %)	33.2051	33.1107	32.9408	32.3045	30.7527	27.5351	25.5350	
CO2	(MOL %)	16.3289	16.0828	15.6640	14.3286	12.0210	9.1507	7.8814	
CO	(MOL %)	0.6300	1.2201	2.2594	5.6126	12.0092	21.4278	25.6114	
N2	(MOL %)	33.2444	33.2368	33.2336	33.1998	33.1824	33.2046	33.1707	
H2	(MOL %)	0.0401	0.0904	0.1959	0.6223	1.7970	4.3670	6.6191	
O2	(MOL %)	0.0036	0.0034	0.0028	0.0026	0.0014	0.0006	0.0012	
NH3	(MOL %)	0.0410	0.0714	0.1203	0.2706	0.5513	0.9641	0.7412	
OH	(MOL %)	0.0295	0.0418	0.0537	0.0907	0.1094	0.1077	0.1711	
H	(MOL %)	0.0004	0.0010	0.0023	0.0089	0.0252	0.0563	0.1154	
CH4	(MOL %)	0.0000	0.0001	0.0005	0.0039	0.0275	0.1412	0.0836	
NO	(MOL %)	0.1139	0.1146	0.1046	0.1104	0.0817	0.0522	0.0699	
C(S)	(MOL %)	16.3629	16.0268	15.4222	13.4452	9.4413	2.9927	0.0	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



O RDX

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

RDX RHO = 1.8000 G/CC EO = 1.690200E+04 CAL/MOLE

LN P = -3.48543167 E+00 -2.46412659 E+00LN V 3.27104032 E-01LN V*2 -3.12879831 E-02LN V*3 7.58543611 E-04LN V*4

LN T = 7.67655945 E+00 -4.63019252 E-01LN V 1.26736641 E-01LN V*2 -1.97552741 E-02LN V*3 9.98023199 E-04LN V*4

LN E = -1.64354992 E+00 4.73902702 E-01LNP 7.15208054 E-02LN P*2 5.38250059 E-03LN P*3 1.51338623 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (633.105)	0.3453	4256.2 (4176.2)	-1378.6	0.15768 (0.15448)	3.2695	735.6
500.000 (515.381)	0.3680	3956.0 (3971.5)	-1063.6	0.14450 (0.14379)	3.2150	1215.7
400.000 (406.805)	0.3963	3674.7 (3751.9)	-751.9	0.13146 (0.13242)	3.1524	1750.3
* 336.288 (339.827)	0.4198	3487.8 (3595.4)	-545.4	0.12282 (0.12470)	3.1047	2136.8
300.000 (300.234)	0.4370	3427.5 (3492.6)	-446.9	0.11870 (0.12009)	3.0718	2397.5
200.000 (195.190)	0.5041	3196.1 (3164.6)	-139.3	0.10583 (0.10620)	2.9573	3233.8
100.000 (95.787)	0.6465	2782.6 (2709.0)	255.4	0.08931 (0.08919)	2.7676	4410.5
80.000 (76.564)	0.7016	2652.7 (2585.0)	354.3	0.08517 (0.08502)	2.7079	4735.7
60.000 (57.520)	0.7809	2490.9 (2438.4)	466.3	0.08049 (0.08037)	2.6317	5123.7
50.000 (48.067)	0.8366	2393.6 (2352.7)	528.8	0.07787 (0.07778)	2.5839	5352.9
40.000 (38.641)	0.9112	2280.6 (2254.6)	597.6	0.07500 (0.07493)	2.5258	5617.8
30.000 (29.104)	1.0212	2148.0 (2136.5)	674.4	0.07178 (0.07171)	2.4505	5941.0
20.000 (19.725)	1.2009	1979.1 (1990.0)	765.7	0.06796 (0.06790)	2.3475	6350.1
10.000 (10.147)	1.6118	1747.2 (1776.3)	885.1	0.06297 (0.06286)	2.1729	6970.5
8.000 (8.181)	1.7821	1685.8 (1715.8)	916.2	0.06166 (0.06155)	2.1169	7153.3
6.000 (6.187)	2.0382	1613.9 (1642.9)	952.8	0.06013 (0.06002)	2.0448	7378.8
5.000 (5.175)	2.2265	1572.4 (1599.5)	974.0	0.05925 (0.05913)	1.9991	7516.7
4.000 (4.151)	2.4900	1525.2 (1548.9)	998.2	0.05824 (0.05813)	1.9431	7680.7
3.000 (3.114)	2.8950	1473.7 (1487.9)	1026.6	0.05705 (0.05694)	1.8711	7885.2
2.000 (2.066)	3.6271	1407.2 (1409.3)	1063.4	0.05551 (0.05543)	1.7706	8160.8
1.000 (1.017)	5.5224	1303.2 (1293.8)	1119.0	0.05318 (0.05319)	1.6052	8599.7
0.800 (0.809)	6.3826	1272.1 (1261.1)	1135.3	0.05250 (0.05252)	1.5547	8733.3
0.600 (0.603)	7.7438	1233.0 (1221.6)	1155.7	0.05165 (0.05170)	1.4923	8900.4
0.500 (0.500)	8.7883	1208.8 (1197.9)	1168.3	0.05112 (0.05120)	1.4545	9003.8
0.400 (0.398)	10.3063	1179.7 (1170.2)	1183.2	0.05049 (0.05059)	1.4103	9128.0
0.300 (0.297)	12.7458	1142.9 (1136.0)	1202.0	0.04971 (0.04982)	1.3571	9284.8
0.200 (0.196)	17.4338	1094.3 (1089.9)	1227.8	0.04863 (0.04876)	1.2902	9500.7
0.100 (0.097)	30.6413	1013.5 (1013.7)	1270.0	0.04686 (0.04700)	1.2030	9855.4
0.080 (0.078)	36.9312	988.0 (989.2)	1282.8	0.04633 (0.04645)	1.1830	9965.8
0.060 (0.059)	47.0541	954.9 (957.4)	1299.1	0.04565 (0.04574)	1.1635	10105.0
0.050 (0.049)	54.8949	933.9 (937.0)	1309.1	0.04523 (0.04530)	1.1547	10191.6
0.040 (0.039)	66.3195	908.3 (911.6)	1321.0	0.04473 (0.04477)	1.1476	10296.1
0.030 (0.030)	84.6268	875.2 (878.5)	1335.8	0.04411 (0.04410)	1.1443	10428.3
0.020 (0.020)	119.2109	828.3 (830.8)	1355.7	0.04328 (0.04320)	1.1503	10610.4
0.010 (0.010)	212.9998	747.5 (747.9)	1386.7	0.04198 (0.04181)	1.1871	10910.5
0.008 (0.008)	256.4780	721.8 (721.2)	1395.7	0.04160 (0.04142)	1.2055	11004.6
0.006 (0.006)	325.2524	688.5 (687.2)	1407.0	0.04113 (0.04096)	1.2333	11123.3
0.005 (0.005)	377.5186	666.9 (666.1)	1414.0	0.04084 (0.04071)	1.2532	11196.9
0.004 (0.004)	453.1648	641.5 (640.5)	1421.9	0.04051 (0.04043)	1.2799	11286.0
0.003 (0.003)	572.7517	609.2 (608.5)	1431.7	0.04010 (0.04014)	1.3179	11398.4
0.002 (0.002)	794.8806	564.7 (565.6)	1444.5	0.03956 (0.03989)	1.3777	11551.4

* C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

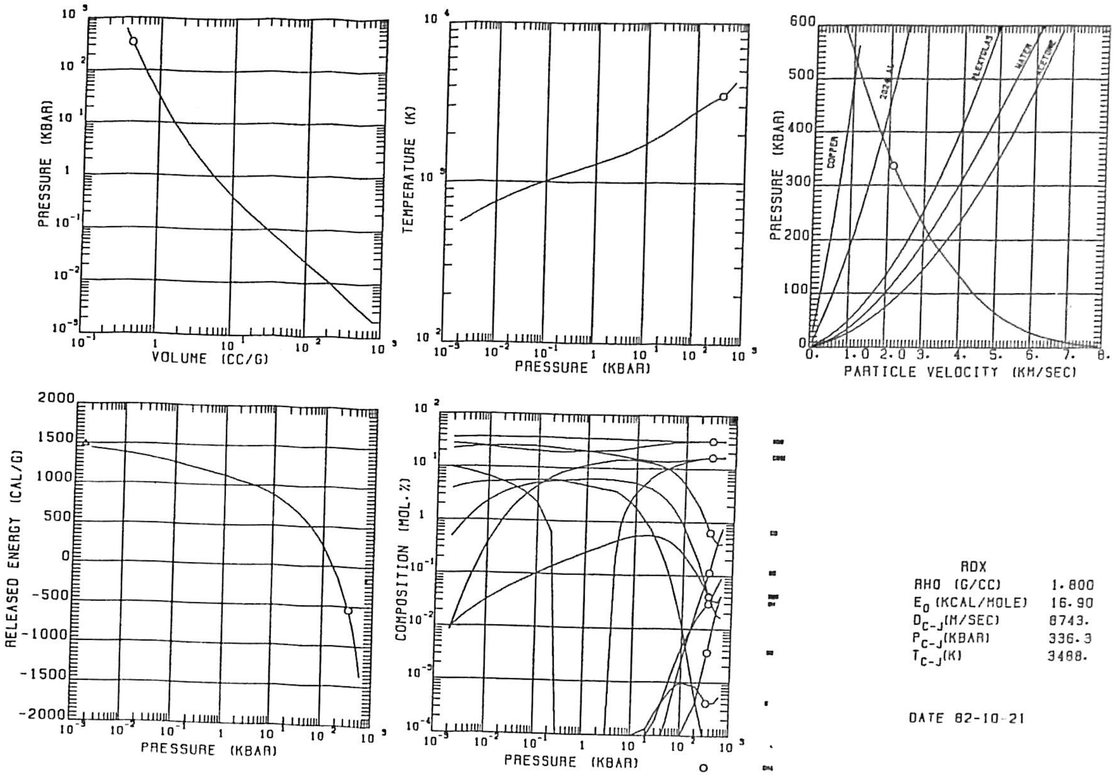
RDX RHO = 1.8000 G/CC EO = 1.690200E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
336.288	2.98948	1.47007	0.05682	2.99303	0.00362	0.00033	0.00370	0.00266	0.00004	0.00000	0.01025	1.47310
300.000	2.98666	1.46420	0.07461	2.99396	0.00523	0.00021	0.00458	0.00241	0.00005	0.00000	0.00751	1.46119
200.000	2.96886	1.42739	0.17257	2.99431	0.01661	0.00004	0.00911	0.00146	0.00008	0.00004	0.00226	1.40000
100.000	2.89303	1.32124	0.46386	2.98883	0.07169	0.00000	0.02211	0.00040	0.00009	0.00094	0.00022	1.21397
80.000	2.85273	1.28537	0.57619	2.98633	0.10207	0.00000	0.02723	0.00024	0.00008	0.00210	0.00010	1.13634
60.000	2.78822	1.24561	0.72041	2.98302	0.15020	0.00000	0.03393	0.00012	0.00006	0.00530	0.00003	1.02868
50.000	2.74036	1.22641	0.80674	2.98103	0.18480	0.00000	0.03792	0.00007	0.00005	0.00895	0.00002	0.95791
40.000	2.67476	1.21068	0.90384	2.97886	0.22986	0.00000	0.04227	0.00004	0.00004	0.01597	0.00001	0.86952
30.000	2.58301	1.20452	1.00793	2.97689	0.28801	0.00000	0.04622	0.00002	0.00002	0.02981	0.00000	0.75774
20.000	2.43054	1.22142	1.12662	2.97521	0.36584	0.00000	0.04957	0.00001	0.00001	0.06462	0.00000	0.58737
10.000	2.15219	1.30952	1.22879	2.97655	0.45728	0.00000	0.04690	0.00000	0.00000	0.16009	0.00000	0.30164
8.000	2.06642	1.34767	1.23827	2.97773	0.47464	0.00000	0.04454	0.00000	0.00000	0.19607	0.00000	0.21802
6.000	1.96471	1.40078	1.23376	2.97951	0.48938	0.00000	0.04098	0.00000	0.00000	0.24223	0.00000	0.12328
5.000	1.90603	1.43514	1.22372	2.98070	0.49553	0.00000	0.03860	0.00000	0.00000	0.27027	0.00000	0.07088
4.000	1.84144	1.47752	1.20355	2.98216	0.50021	0.00000	0.03569	0.00000	0.00000	0.30241	0.00000	0.01654
3.000	1.80081	1.52115	1.15692	2.98396	0.50714	0.00000	0.03208	0.00000	0.00000	0.32197	0.00000	0.0
2.000	1.76142	1.58104	1.07655	2.98624	0.51238	0.00000	0.02753	0.00000	0.00000	0.34246	0.00000	0.0
1.000	1.69412	1.68934	0.92726	2.98945	0.50734	0.00000	0.02112	0.00000	0.00000	0.38343	0.00000	0.0
0.800	1.67287	1.72480	0.87759	2.99032	0.50281	0.00000	0.01936	0.00000	0.00000	0.39764	0.00000	0.0
0.600	1.64559	1.77151	0.81146	2.99136	0.49441	0.00000	0.01728	0.00000	0.00000	0.41704	0.00000	0.0
0.500	1.62841	1.80154	0.76857	2.99198	0.48773	0.00000	0.01606	0.00000	0.00000	0.42989	0.00000	0.0
0.400	1.60767	1.83828	0.71584	2.99268	0.47849	0.00000	0.01465	0.00000	0.00000	0.44594	0.00000	0.0
0.300	1.58153	1.88574	0.64706	2.99352	0.46458	0.00000	0.01298	0.00000	0.00000	0.46721	0.00000	0.04898
0.200	1.58802	1.93528	0.54150	2.99453	0.44711	0.00000	0.01096	0.00000	0.00000	0.47422	0.00000	0.16843
0.100	1.64040	1.99672	0.36624	2.99594	0.41025	0.00000	0.00814	0.00000	0.00000	0.46857	0.00000	0.20769
0.080	1.66210	2.01123	0.31554	2.99632	0.39582	0.00000	0.00737	0.00000	0.00000	0.46552	0.00000	0.25847
0.060	1.69371	2.02611	0.25417	2.99678	0.37416	0.00000	0.00647	0.00000	0.00000	0.46122	0.00000	0.29005
0.050	1.71548	2.03308	0.21846	2.99704	0.35888	0.00000	0.00594	0.00000	0.00000	0.45837	0.00000	0.32765
0.040	1.74370	2.03882	0.17878	2.99734	0.33881	0.00000	0.00535	0.00000	0.00000	0.45474	0.00000	0.37440
0.030	1.78277	2.04163	0.13409	2.99769	0.31056	0.00000	0.00465	0.00000	0.00000	0.44986	0.00000	0.43724
0.020	1.84301	2.03665	0.08383	2.99812	0.26676	0.00000	0.00379	0.00000	0.00000	0.44229	0.00000	0.53975
0.010	1.96011	2.00489	0.03026	2.99873	0.18583	0.00000	0.00257	0.00000	0.00000	0.42511	0.00000	0.57240
0.008	2.00071	1.98946	0.02053	2.99889	0.16073	0.00000	0.00225	0.00000	0.00000	0.41760	0.00000	0.61623
0.006	2.05613	1.96617	0.01171	2.99908	0.12933	0.00000	0.00187	0.00000	0.00000	0.40588	0.00000	0.64590
0.005	2.09361	1.94936	0.00783	2.99919	0.11016	0.00000	0.00165	0.00000	0.00000	0.39689	0.00000	0.68279
0.004	2.13945	1.92802	0.00469	2.99932	0.08953	0.00000	0.00140	0.00000	0.00000	0.38447	0.00000	0.73325
0.003	2.20049	1.89872	0.00226	2.99946	0.06635	0.00000	0.00113	0.00000	0.00000	0.36575	0.00000	0.81061
0.002	2.29016	1.85467	0.00071	2.99962	0.04067	0.00000	0.00080	0.00000	0.00000	0.33400	0.00000	
400.000	2.99092	1.47014	0.04410	2.98876	0.00246	0.00079	0.00314	0.00378	0.00004	0.00000	0.01933	1.48576
500.000	2.99109	1.46158	0.03456	2.97803	0.00164	0.00215	0.00289	0.00582	0.00004	0.00000	0.04105	1.50386
600.000	2.98892	1.44667	0.03522	2.96463	0.00148	0.00368	0.00368	0.00811	0.00005	0.00000	0.06705	1.51812

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



RDX	
RHO (G/CC)	1.800
E_0 (KCAL/MOLE)	16.90
D_{C-J} (M/SEC)	8743.
P_{C-J} (KBAR)	336.3
T_{C-J} (K)	3488.

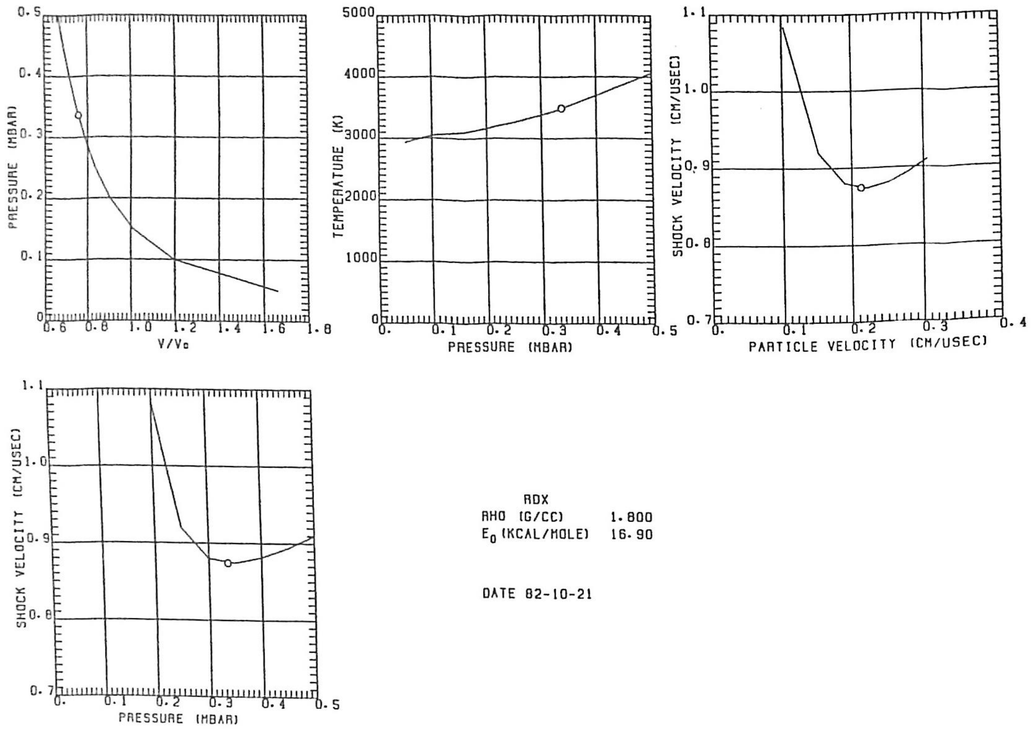
DATE 82-10-21

********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

RDX RHO = 1.8000 G/CC, EO = 1.690200E+04 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3694	0.3819	0.3966	0.4142	0.4360	0.4643	0.5030	0.5613	0.6644	0.9232
TEMP (DEG K)	4069.4	3873.1	3692.8	3528.4	3382.5	3260.0	3163.5	3095.6	3041.9	2932.9
US (M/SEC)	9103.7	8943.8	8813.4	8741.9	8799.9	9193.8	10840.2	0.0	0.0	0.0
UP (M/SEC)	3051.3	2795.2	2521.4	2224.3	1893.9	1510.7	1025.0	0.0	0.0	0.0
H2O (MOLE)	2.9890	2.9902	2.9906	2.9900	2.9879	2.9829	2.9709	2.9381	2.8271	2.3219
CO2 (MOLE)	1.4540	1.4635	1.4691	1.4707	1.4675	1.4570	1.4321	1.3717	1.2169	0.8491
CO (MOLE)	0.0425	0.0424	0.0457	0.0531	0.0677	0.0976	0.1614	0.3162	0.7376	1.9790
N2 (MOLE)	2.9743	2.9825	2.9884	2.9923	2.9945	2.9953	2.9947	2.9917	2.9834	2.9618
H2 (MOLE)	0.0021	0.0022	0.0026	0.0033	0.0047	0.0078	0.0154	0.0377	0.1190	0.4971
O2 (MOLE)	0.0026	0.0015	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0035	0.0032	0.0032	0.0035	0.0042	0.0056	0.0086	0.0154	0.0328	0.0762
OH (MOLE)	0.0073	0.0054	0.0039	0.0029	0.0021	0.0016	0.0013	0.0012	0.0010	0.0007
H (MOLE)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0003	0.0008
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0021	0.0330
NO (MOLE)	0.0480	0.0318	0.0200	0.0119	0.0068	0.0038	0.0021	0.0011	0.0005	0.0002
C(S) (MOLE)	1.5035	1.4941	1.4852	1.4763	1.4648	1.4454	1.4064	1.3119	1.0434	0.1389

K-H-T HUGONIOT



RDX
RHO (G/CC) 1.800
E_0 (KCAL/MOLE) 16.90

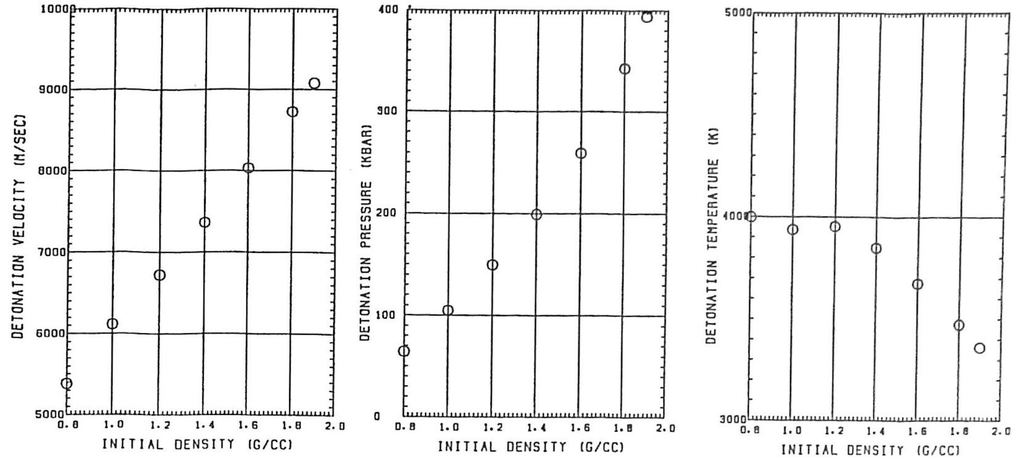
DATE 82-10-21

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES	HMX	# HMX	# HMX	# HMX	# HMX	# HMX	# HMX	#
RHO (G/CC)	1.900	1.800	1.600	1.400	1.200	1.000	0.800	
EO (KCAL/MOLE)	17.89	17.89	17.89	17.89	17.89	17.89	17.89	
MOL.WEIGHT (G)	296.157	296.157	296.157	296.157	296.157	296.157	296.157	
C	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	
H	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
N	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
O	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
DETN.VEL (M/SEC)	9074.8	8722.3	8034.2	7362.1	6724.3	6117.2	5382.2	
PARTICL.VEL(")	2283.2	2182.5	2017.2	1931.8	1854.8	1715.6	1491.9	
C-J PRESS (KBAR)	393.7	342.7	259.3	199.1	149.7	104.9	64.2	
C-J VOLUME (CC/G)	0.39390	0.41654	0.46808	0.52686	0.60348	0.71954	0.90352	
C-J TEMP (DEG K)	3360.7	3474.4	3674.9	3848.2	3952.3	3937.0	3997.1	
C-J S(CAL/DEG MOL)	52.69	53.33	54.30	54.67	54.16	52.55	52.07	
C-J ENERGY (CAL/G)	622.96	569.24	486.27	445.98	411.11	351.75	265.97	
GAMMA	2.975	2.996	2.983	2.811	2.625	2.566	2.608	
C-J DETN.HEAT(CAL)	1470.0	1467.1	1453.3	1422.1	1365.7	1276.1	1225.6	
LAMDA	9.1514	9.1460	9.1193	9.0594	8.9588	8.8245	8.7101	
VOLUM(K LITTRE/KG)	0.8275	0.8291	0.8371	0.8558	0.8908	0.9489	0.9839	
TOTAL PRODCT(MOLE)	12.0061	12.0045	11.9967	11.9795	11.9433	11.8671	11.9101	
V GAS (MOLES)	10.0166	10.0361	10.1334	10.3593	10.7834	11.4866	11.9101	
V GAS (CC/MOLE)	11.1253	11.7272	13.0708	14.4901	16.1467	18.4096	22.4671	
V SOL C(S) (CC/G)	0.21840	0.23972	0.27585	0.30447	0.33075	0.35763	0.38777	
H2O (MOL %)	33.2633	33.2144	32.9709	32.3363	30.8699	27.6510	25.5437	
CO2 (MOL %)	16.4827	16.3535	15.7358	14.3918	12.1671	9.2493	7.9093	
CO (MOL %)	0.2631	0.5699	2.0746	5.4709	11.5878	21.1125	25.5881	
N2 (MOL %)	33.2493	33.2446	33.2320	33.2080	33.1848	33.2094	33.1823	
H2 (MOL %)	0.0137	0.0354	0.1754	0.6058	1.7082	4.2848	6.6204	
O2 (MOL %)	0.0040	0.0037	0.0030	0.0023	0.0015	0.0006	0.0010	
NH3 (MOL %)	0.0200	0.0378	0.1120	0.2633	0.5320	0.9456	0.7430	
OH (MOL %)	0.0188	0.0282	0.0530	0.0839	0.1069	0.1010	0.1554	
H (MOL %)	0.0001	0.0004	0.0021	0.0081	0.0237	0.0524	0.1070	
CH4 (MOL %)	0.0000	0.0000	0.0004	0.0037	0.0251	0.1378	0.0876	
NO (MOL %)	0.1143	0.1147	0.1091	0.1017	0.0814	0.0487	0.0623	
C(S) (MOL %)	16.5707	16.3974	15.5318	13.5242	9.7116	3.2069	0.0	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



○ HMX

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

HMX RHO = 1.9000 G/CC EO = 1.789000E+04 CAL/MOLE

LN P = -3.51936531 E+00 -2.47832584 E+00LN V 3.14291775 E-01LN V*2 -2.32229978 E-02LN V*3 -2.67098891 E-04LN V*4

LN T = 7.63056087 E+00 -4.40659523 E-01LN V 1.11116529 E-01LN V*2 -1.59211531 E-02LN V*3 6.48812857 E-04LN V*4

LN E = -1.68278790 E+00 4.65302467 E-01LNP 7.09536076 E-02LN P*2 5.43424487 E-03LN P*3 1.56752722 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (625.293)	0.3419	3898.3 (3835.1)	-1240.0	0.15188 (0.14917)	3.2318	1247.8
500.000 (510.895)	0.3642	3630.4 (3663.4)	-940.4	0.13935 (0.13904)	3.1833	1721.0
400.000 (405.356)	0.3919	3377.7 (3478.9)	-642.1	0.12686 (0.12827)	3.1274	2247.5
* 393.671 (398.783)	0.3939	3360.7 (3466.3)	-622.1	0.12603 (0.12756)	3.1235	2283.2
300.000 (298.190)	0.4328	3228.2 (3252.5)	-379.7	0.11589 (0.11657)	3.0530	2907.5
200.000 (195.114)	0.4985	3019.3 (2971.0)	-80.1	0.10335 (0.10337)	2.9493	3727.4
100.000 (96.375)	0.6379	2649.5 (2572.4)	301.4	0.08739 (0.08717)	2.7749	4888.0
80.000 (77.156)	0.6917	2531.8 (2462.4)	396.9	0.08339 (0.08320)	2.7195	5209.2
60.000 (58.050)	0.7690	2384.6 (2331.4)	504.8	0.07888 (0.07875)	2.6482	5593.0
50.000 (48.506)	0.8235	2296.7 (2254.0)	564.4	0.07639 (0.07627)	2.6030	5820.8
40.000 (39.006)	0.8962	2192.9 (2165.0)	630.5	0.07362 (0.07355)	2.5480	6083.3
30.000 (29.349)	1.0037	2069.9 (2056.9)	704.5	0.07052 (0.07047)	2.4760	6404.9
20.000 (19.883)	1.1784	1911.9 (1922.0)	792.7	0.06683 (0.06682)	2.3770	6810.1
10.000 (10.200)	1.5770	1692.4 (1722.3)	908.5	0.06199 (0.06197)	2.2065	7424.5
8.000 (8.210)	1.7422	1633.9 (1664.9)	938.7	0.06073 (0.06070)	2.1510	7605.6
6.000 (6.195)	1.9905	1565.5 (1595.3)	973.9	0.05925 (0.05922)	2.0790	7828.8
5.000 (5.174)	2.1727	1525.8 (1553.6)	994.3	0.05840 (0.05837)	2.0330	7965.1
4.000 (4.143)	2.4275	1480.6 (1504.9)	1017.6	0.05742 (0.05739)	1.9764	8127.0
3.000 (3.101)	2.8185	1426.8 (1445.6)	1045.5	0.05626 (0.05624)	1.9030	8328.3
2.000 (2.052)	3.5227	1358.5 (1368.8)	1081.2	0.05476 (0.05477)	1.7994	8598.7
1.000 (1.006)	5.3430	1257.3 (1254.3)	1134.6	0.05253 (0.05257)	1.6256	9028.2
0.800 (0.800)	6.1678	1227.7 (1221.6)	1150.3	0.05187 (0.05192)	1.5718	9158.5
0.600 (0.595)	7.4748	1191.5 (1181.8)	1169.3	0.05107 (0.05112)	1.5045	9321.6
0.500 (0.494)	8.4741	1168.6 (1158.0)	1181.5	0.05057 (0.05062)	1.4636	9422.0
0.400 (0.393)	9.9285	1141.5 (1130.0)	1195.7	0.04997 (0.05003)	1.4155	9542.8
0.300 (0.294)	12.2658	1107.1 (1095.5)	1213.6	0.04922 (0.04928)	1.3572	9695.1
0.200 (0.195)	16.7379	1059.2 (1049.3)	1238.2	0.04819 (0.04825)	1.2842	9904.0
0.100 (0.098)	29.2647	977.3 (973.6)	1278.4	0.04651 (0.04655)	1.1913	10246.3
0.080 (0.079)	35.2106	951.1 (949.3)	1290.6	0.04600 (0.04602)	1.1716	10352.9
0.060 (0.059)	44.7618	917.1 (917.9)	1306.0	0.04536 (0.04536)	1.1543	10487.7
0.050 (0.050)	52.1437	895.4 (897.7)	1315.5	0.04496 (0.04494)	1.1482	10571.7
0.040 (0.040)	62.8738	868.9 (872.5)	1326.7	0.04449 (0.04445)	1.1459	10673.2
0.030 (0.031)	80.0155	834.5 (839.5)	1340.6	0.04391 (0.04384)	1.1516	10802.0
0.020 (0.021)	112.2501	785.9 (791.4)	1359.2	0.04313 (0.04303)	1.1759	10979.9
0.010 (0.010)	199.2729	703.1 (705.7)	1387.8	0.04194 (0.04184)	1.2618	11275.3
0.008 (0.008)	238.9807	675.9 (677.5)	1396.5	0.04157 (0.04153)	1.3009	11367.2
0.006 (0.006)	302.2217	642.3 (640.7)	1406.8	0.04114 (0.04119)	1.3598	11484.2
0.005 (0.005)	350.5298	621.5 (617.3)	1413.0	0.04088 (0.04101)	1.4021	11557.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

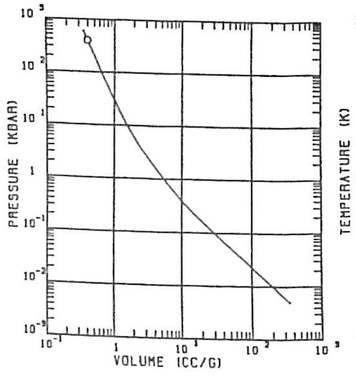
HMX RHO = 1.9000 G/CC EO = 1.789000E+04 CAL/MOLE

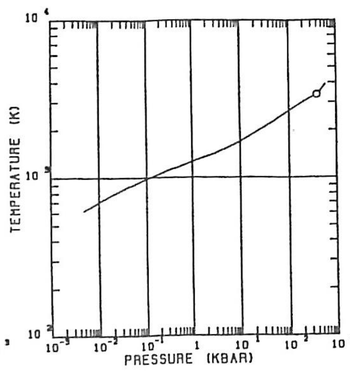
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

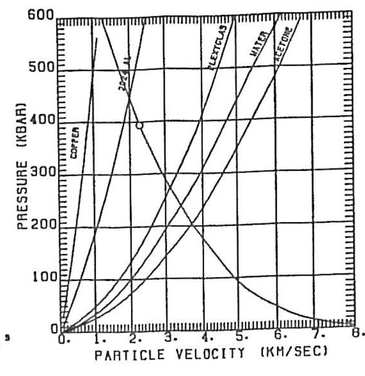
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
393.671	3.99359	1.97888	0.03177	3.99195	0.00165	0.00047	0.00241	0.00226	0.00001	0.00000	0.01368	1.98935
300.000	3.98847	1.96930	0.06444	3.99472	0.00433	0.00016	0.00419	0.00182	0.00003	0.00000	0.00637	1.96626
200.000	3.97129	1.93375	0.15821	3.99466	0.01481	0.00002	0.00885	0.00110	0.00005	0.00003	0.00184	1.90801
100.000	3.89180	1.82087	0.46596	3.98815	0.07116	0.00000	0.02352	0.00031	0.00006	0.00079	0.00018	1.71238
80.000	3.84783	1.78052	0.59087	3.98514	0.10385	0.00000	0.02964	0.00019	0.00005	0.00187	0.00008	1.62674
60.000	3.77570	1.73441	0.75537	3.98102	0.15722	0.00000	0.03794	0.00009	0.00004	0.00505	0.00003	1.50517
50.000	3.72007	1.71058	0.85872	3.97839	0.19727	0.00000	0.04321	0.00006	0.00004	0.00890	0.00001	1.42181
40.000	3.64349	1.69151	0.97345	3.97546	0.24979	0.00000	0.04906	0.00003	0.00003	0.01655	0.00001	1.31850
30.000	3.53392	1.68427	1.09753	3.97260	0.31914	0.00000	0.05480	0.00001	0.00002	0.03236	0.00000	1.18589
20.000	3.34672	1.70764	1.23802	3.96983	0.41451	0.00000	0.06034	0.00000	0.00001	0.07413	0.00000	0.98026
10.000	2.98819	1.82815	1.35553	3.97052	0.53064	0.00000	0.05896	0.00000	0.00000	0.19636	0.00000	0.62001
8.000	2.87321	1.88043	1.36597	3.97181	0.55353	0.00000	0.05639	0.00000	0.00000	0.24434	0.00000	0.50931
6.000	2.73453	1.95270	1.36011	3.97388	0.57348	0.00000	0.05225	0.00000	0.00000	0.30681	0.00000	0.38042
5.000	2.65380	1.99955	1.34714	3.97531	0.58176	0.00000	0.04939	0.00000	0.00000	0.34518	0.00000	0.30815
4.000	2.56411	2.05691	1.32211	3.97709	0.58811	0.00000	0.04582	0.00000	0.00000	0.38953	0.00000	0.23148
3.000	2.46424	2.12982	1.27615	3.97936	0.59143	0.00000	0.04128	0.00000	0.00000	0.44120	0.00000	0.15286
2.000	2.35310	2.22784	1.19127	3.98232	0.58966	0.00000	0.03538	0.00000	0.00000	0.50209	0.00000	0.07884
1.000	2.23061	2.37811	1.01323	3.98651	0.57650	0.00000	0.02699	0.00000	0.00000	0.57621	0.00000	0.03249
0.800	2.20667	2.42162	0.95016	3.98765	0.57016	0.00000	0.02472	0.00000	0.00000	0.59305	0.00000	0.03522
0.600	2.18481	2.47345	0.86836	3.98897	0.56142	0.00000	0.02208	0.00000	0.00000	0.61033	0.00000	0.04790
0.500	2.17791	2.50525	0.81166	3.98974	0.55369	0.00000	0.02053	0.00000	0.00000	0.61880	0.00000	0.06433
0.400	2.17402	2.54111	0.74384	3.99062	0.54414	0.00000	0.01878	0.00000	0.00000	0.62684	0.00000	0.08824
0.300	2.17790	2.58327	0.65564	3.99165	0.52993	0.00000	0.01670	0.00000	0.00000	0.63356	0.00000	0.12758
0.200	2.19912	2.63450	0.53195	3.99296	0.50549	0.00000	0.01410	0.00000	0.00000	0.63712	0.00000	0.19643
0.100	2.27189	2.69630	0.33560	3.99481	0.44929	0.00000	0.01040	0.00000	0.00000	0.63162	0.00000	0.33647
0.080	2.30262	2.70831	0.28087	3.99532	0.42765	0.00000	0.00938	0.00000	0.00000	0.62783	0.00000	0.38298
0.060	2.34731	2.71800	0.21679	3.99592	0.39621	0.00000	0.00819	0.00000	0.00000	0.62210	0.00000	0.44310
0.050	2.37836	2.72052	0.18070	3.99626	0.37451	0.00000	0.00749	0.00000	0.00000	0.61795	0.00000	0.48082
0.040	2.41867	2.71983	0.14178	3.99666	0.34650	0.00000	0.00670	0.00000	0.00000	0.61240	0.00000	0.52599
0.030	2.47458	2.71279	0.09997	3.99713	0.30819	0.00000	0.00577	0.00000	0.00000	0.60430	0.00000	0.58295
0.020	2.56046	2.69162	0.05642	3.99771	0.25172	0.00000	0.00461	0.00000	0.00000	0.59046	0.00000	0.66150
0.010	2.72491	2.62933	0.01659	3.99851	0.15818	0.00000	0.00301	0.00000	0.00000	0.55620	0.00000	0.79788
0.008	2.78457	2.60272	0.01015	3.99873	0.12986	0.00000	0.00258	0.00000	0.00000	0.54086	0.00000	0.84627
0.006	2.86169	2.56665	0.00520	3.99897	0.09892	0.00000	0.00209	0.00000	0.00000	0.51814	0.00000	0.91002
0.005	2.91203	2.54244	0.00329	3.99911	0.08183	0.00000	0.00182	0.00000	0.00000	0.50172	0.00000	0.95256
400.000	3.99367	1.97868	0.03100	3.99152	0.00159	0.00052	0.00238	0.00234	0.00001	0.00000	0.01459	1.99032
500.000	3.99397	1.97133	0.02368	3.98248	0.00101	0.00153	0.00211	0.00370	0.00002	0.00000	0.03294	2.00500
600.000	3.99243	1.95864	0.02426	3.97093	0.00090	0.00268	0.00270	0.00523	0.00002	0.00000	0.05544	2.01710

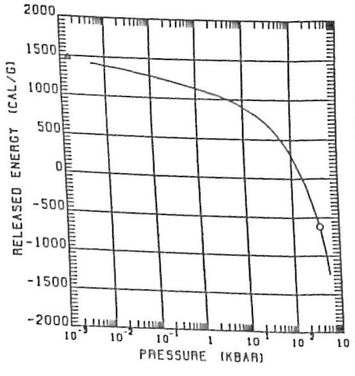
PRESS ;KBAR, PRODUCTS ;MOLES

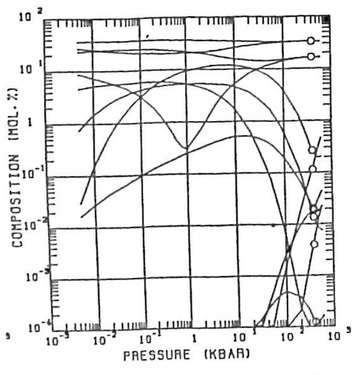
K-H-T ISENTROPE THRU C-J POINT











HMX

RHO (G/CC)	1.900
E_0 (KCAL/MOLE)	17.89
D_{C-J}(M/SEC)	9075.
P_{C-J}(KBAR)	393.7
T_{C-J}(K)	3361.

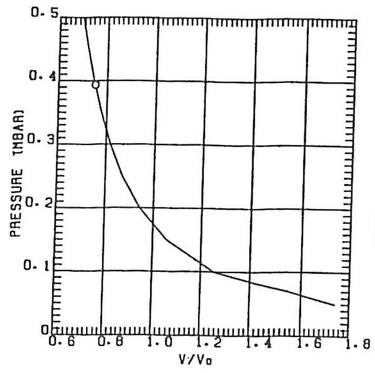
DATE 82-10-21

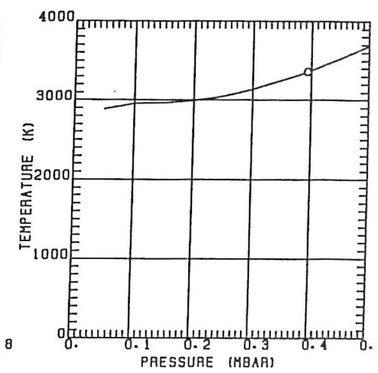
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

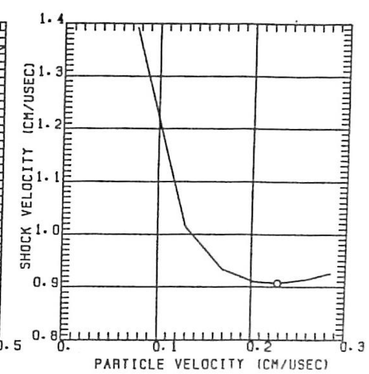
HMX RHO = 1.9000 G/CC, EO = 1.789000E+04 CAL/MOLE

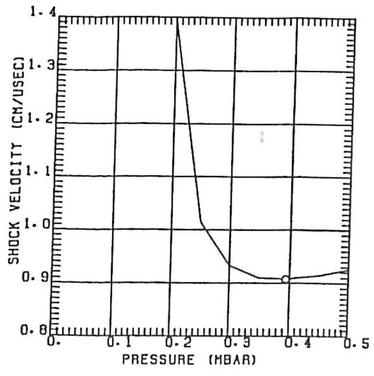
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3649	0.3773	0.3919	0.4093	0.4310	0.4590	0.4977	0.5558	0.6580	0.9146
TEMP (DEG K)	3689.7	3525.7	3378.4	3247.9	3136.7	3049.7	2992.0	2964.8	2954.1	2885.6
US (M/SEC)	9262.1	9147.2	9078.7	9103.2	9335.0	10145.7	13922.8	0.0	0.0	0.0
UP (M/SEC)	2841.2	2589.2	2318.9	2023.6	1691.4	1296.9	756.0	0.0	0.0	0.0
H2O (MOLE)	3.9931	3.9937	3.9937	3.9928	3.9907	3.9856	3.9729	3.9360	3.8030	3.1587
CO2 (MOLE)	1.9679	1.9749	1.9787	1.9791	1.9754	1.9646	1.9376	1.8676	1.6734	1.1780
CO (MOLE)	0.0271	0.0277	0.0310	0.0380	0.0518	0.0810	0.1491	0.3269	0.8487	2.4843
N2 (MOLE)	3.9807	3.9871	3.9915	3.9943	3.9957	3.9960	3.9949	3.9912	3.9805	3.9516
H2 (MOLE)	0.0012	0.0013	0.0016	0.0022	0.0034	0.0063	0.0139	0.0383	0.1345	0.6158
O2 (MOLE)	0.0017	0.0010	0.0005	0.0003	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0024	0.0023	0.0024	0.0027	0.0035	0.0050	0.0084	0.0166	0.0384	0.0966
OH (MOLE)	0.0043	0.0032	0.0023	0.0018	0.0014	0.0011	0.0010	0.0010	0.0010	0.0008
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0008
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0021	0.0399
NO (MOLE)	0.0363	0.0236	0.0146	0.0087	0.0051	0.0029	0.0017	0.0010	0.0005	0.0002
C(S) (MOLE)	2.0050	1.9974	1.9903	1.9829	1.9728	1.9544	1.9132	1.8054	1.4758	0.2978

K-H-T HUGONIOT









HMX

RHO (G/CC)	1.900
E_0 (KCAL/MOLE)	17.89

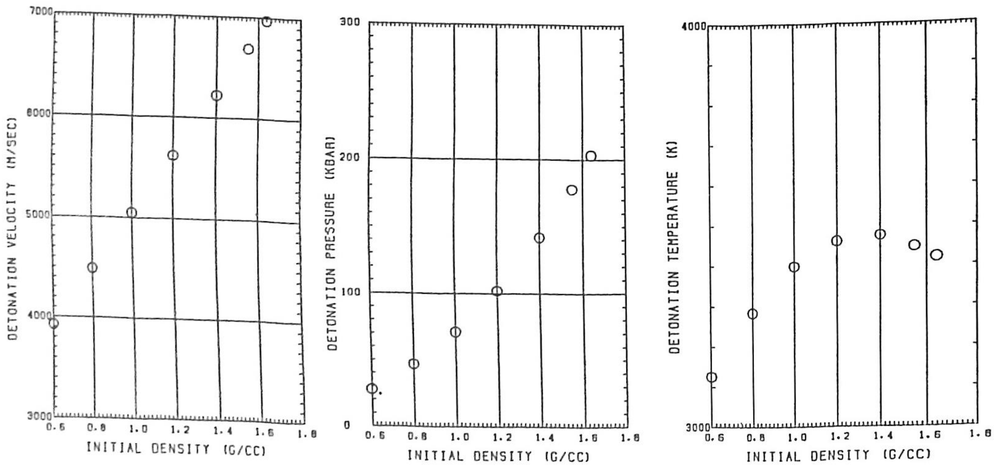
DATE 82-10-21

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES	TNT	# TNT	# TNT	# TNT	# TNT	# TNT	# TNT	#
RHO (G/CC)	1.640	1.550	1.400	1.200	1.000	0.800	0.600	
EO (KCAL/MOLE)	-14.19	-14.19	-14.19	-14.19	-14.19	-14.19	-14.19	
MOL.WEIGHT (G)	227.134	227.134	227.134	227.134	227.134	227.134	227.134	
C	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	
H	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
N	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
O	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
DETN.VEL (M/SEC)	6969.3	6686.8	6221.6	5623.8	5050.6	4488.8	3921.2	
PARTICL.VEL(")	1778.5	1716.5	1628.7	1511.5	1409.1	1301.8	1167.8	
C-J PRESS (KBAR)	203.3	177.9	141.9	102.0	71.2	46.7	27.5	
C-J VOLUME (CC/G)	0.45415	0.47954	0.52730	0.60936	0.72101	0.88749	1.17033	
C-J TEMP (DEG K)	3419.8	3446.2	3474.2	3460.3	3398.3	3284.6	3126.0	
C-J S(CAL/DEG MOL)	64.54	64.47	63.92	62.18	59.53	56.29	53.04	
C-J ENERGY (CAL/G)	378.01	352.11	316.99	273.03	237.27	202.52	162.97	
GAMMA	2.919	2.895	2.820	2.721	2.584	2.448	2.358	
C-J DETN.HEAT(CAL)	1274.3	1263.1	1235.6	1178.5	1098.6	997.7	883.7	
LAMDA	9.3958	9.3603	9.2772	9.1207	8.9410	8.7776	8.6578	
VOLUM(K LITTRE/KG)	0.6328	0.6397	0.6566	0.6925	0.7439	0.8109	0.8882	
TOTAL PRODCT(MOLE)	10.9959	10.9929	10.9856	10.9671	10.9279	10.8445	10.7053	
V GAS (MOLES)	5.8750	5.9389	6.0960	6.4288	6.9067	7.5281	8.2464	
V GAS (CC/MOLE)	14.4132	15.1405	16.4445	18.5073	21.0711	24.6793	30.6435	
V SOL C(S) (CC/G)	0.30040	0.31307	0.33246	0.35641	0.37758	0.39648	0.44444	
H2O (MOL %)	22.4783	22.3401	21.9556	20.9217	18.8998	15.4036	10.5330	
CO2 (MOL %)	14.9483	14.4898	13.4090	11.3325	8.8517	6.3863	4.1766	
CO (MOL %)	2.1404	3.2115	5.7965	11.0828	18.2727	27.1334	37.1521	
N2 (MOL %)	13.5968	13.5895	13.5722	13.5407	13.5161	13.5515	13.7163	
H2 (MOL %)	0.1517	0.2549	0.5564	1.4015	3.0701	5.8976	9.7371	
O2 (MOL %)	0.0008	0.0006	0.0004	0.0002	0.0001	0.0000	0.0000	
NH3 (MOL %)	0.0622	0.0875	0.1455	0.2613	0.4140	0.5579	0.5899	
OH (MOL %)	0.0218	0.0244	0.0275	0.0274	0.0227	0.0151	0.0077	
H (MOL %)	0.0011	0.0018	0.0038	0.0084	0.0150	0.0220	0.0266	
CH4 (MOL %)	0.0005	0.0013	0.0056	0.0312	0.1337	0.4483	1.0904	
NO (MOL %)	0.0272	0.0239	0.0186	0.0117	0.0064	0.0029	0.0010	
C(S) (MOL %)	46.5710	45.9748	44.5088	41.3807	36.7978	30.5813	22.9692	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

TNT RHO = 1.6400 G/CC EO = -1.419400E+04 CAL/MOLE

LN P = -3.73800659 E+00 -2.39807701 .E+00LN V 3.39338660 E-01LN V*2 -3.66053022 E-02LN V*3 1.31823565 E-03LN V*4

LN T = 7.72709942 E+00 -4.39552426 E-01LN V 1.35268509 E-01LN V*2 -2.25890838 E-02LN V*3 1.34788733 E-03LN V*4

LN E = -1.59620953 E+00 4.35206234 E-01LNP 7.16896653 E-02LN P*2 5.66520914 E-03LN P*3 1.63914126 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (554.148)	0.3280	4707.2 (4530.4)	-1438.2	0.16018 (0.15485)	3.2984	0.0
400.000 (416.085)	0.3582	4252.9 (4217.4)	-1070.0	0.14477 (0.14384)	3.2164	404.4
300.000 (299.557)	0.3973	3831.4 (3892.7)	-720.0	0.13012 (0.13189)	3.1223	1036.9
* 203.279 (198.767)	0.4542	3419.8 (3532.9)	-377.7	0.11580 (0.11890)	3.0047	1778.5
200.000 (195.365)	0.4568	3412.0 (3518.7)	-369.4	0.11545 (0.11843)	2.9997	1808.4
100.000 (95.181)	0.5856	3013.3 (2994.7)	-35.1	0.10147 (0.10200)	2.7935	2931.6
80.000 (76.200)	0.6347	2883.4 (2855.5)	50.7	0.09788 (0.09801)	2.7297	3236.6
60.000 (57.409)	0.7052	2718.6 (2692.1)	149.4	0.09375 (0.09357)	2.6487	3599.9
50.000 (48.057)	0.7547	2618.2 (2596.8)	205.2	0.09141 (0.09111)	2.5979	3814.8
40.000 (38.719)	0.8210	2501.6 (2488.1)	266.7	0.08884 (0.08842)	2.5363	4063.3
30.000 (28.667)	0.9261	2364.3 (2348.7)	334.8	0.08599 (0.08541)	2.4508	4387.8
20.000 (19.619)	1.0849	2187.6 (2191.1)	418.0	0.08251 (0.08189)	2.3435	4765.5
10.000 (10.187)	1.4518	1942.7 (1960.4)	528.9	0.07787 (0.07733)	2.1601	5347.3
8.000 (8.219)	1.6057	1878.3 (1895.0)	557.4	0.07668 (0.07617)	2.1007	5521.2
6.000 (6.215)	1.8387	1802.8 (1816.5)	591.1	0.07527 (0.07482)	2.0243	5736.7
5.000 (5.199)	2.0104	1758.5 (1770.0)	611.2	0.07443 (0.07405)	1.9759	5868.7
4.000 (4.168)	2.2522	1708.7 (1716.2)	633.8	0.07348 (0.07318)	1.9166	6026.4
3.000 (3.124)	2.6257	1649.9 (1651.9)	660.9	0.07235 (0.07215)	1.8405	6223.3
2.000 (2.072)	3.3045	1575.8 (1570.5)	695.9	0.07088 (0.07084)	1.7348	6489.3
1.000 (1.020)	5.0827	1467.3 (1454.4)	749.0	0.06866 (0.06885)	1.5623	6914.9
0.800 (0.811)	5.9004	1436.1 (1422.4)	764.7	0.06800 (0.06825)	1.5099	7045.3
0.600 (0.604)	7.2071	1397.8 (1384.5)	784.5	0.06718 (0.06748)	1.4454	7209.5
0.500 (0.500)	8.2202	1374.5 (1362.1)	796.7	0.06667 (0.06700)	1.4064	7311.6
0.400 (0.398)	9.7043	1346.8 (1336.2)	811.5	0.06605 (0.06641)	1.3610	7434.8
0.300 (0.296)	12.1162	1312.2 (1304.9)	830.2	0.06527 (0.06565)	1.3066	7591.0
0.200 (0.195)	16.7964	1265.5 (1263.7)	856.0	0.06418 (0.06456)	1.2390	7806.6
0.100 (0.097)	30.1892	1190.3 (1197.4)	898.9	0.06239 (0.06267)	1.1519	8162.3
0.080 (0.078)	36.6530	1167.5 (1176.3)	912.1	0.06184 (0.06205)	1.1319	8273.8
0.060 (0.059)	47.1375	1138.5 (1149.0)	929.4	0.06112 (0.06125)	1.1118	8414.9
0.050 (0.049)	55.3886	1121.2 (1131.3)	939.4	0.06069 (0.06075)	1.1022	8503.8
0.040 (0.040)	67.4471	1099.7 (1109.7)	952.4	0.06015 (0.06014)	1.0937	8610.9
0.030 (0.030)	87.0928	1073.3 (1081.4)	968.2	0.05949 (0.05936)	1.0877	8747.9
0.020 (0.020)	125.0325	1037.4 (1041.2)	989.7	0.05859 (0.05831)	1.0878	8938.8
0.010 (0.010)	232.4991	979.4 (974.5)	1024.7	0.05713 (0.05671)	1.1075	9260.5
0.008 (0.008)	283.9858	961.6 (954.5)	1035.4	0.05668 (0.05627)	1.1180	9362.9
0.006 (0.006)	367.5874	939.0 (930.5)	1048.9	0.05611 (0.05576)	1.1341	9493.9
0.005 (0.005)	432.9185	924.9 (916.7)	1057.3	0.05576 (0.05549)	1.1454	9576.3
0.004 (0.004)	528.8938	908.0 (901.4)	1067.3	0.05535 (0.05522)	1.1603	9676.4
0.003 (0.003)	684.6658	886.5 (885.2)	1079.9	0.05482 (0.05496)	1.1807	9804.1
0.002 (0.002)	985.0137	856.9 (870.5)	1097.0	0.05410 (0.05484)	1.2107	9980.7

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

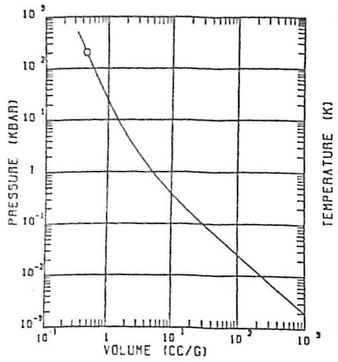
TNT RHO = 1.6400 G/CC EO = -1.419400E+04 CAL/MOLE

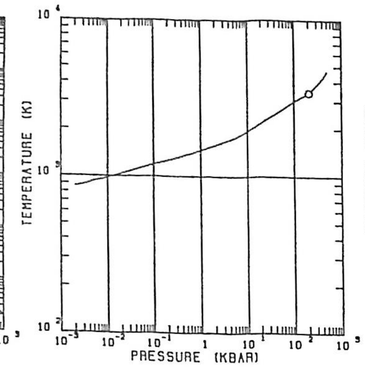
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

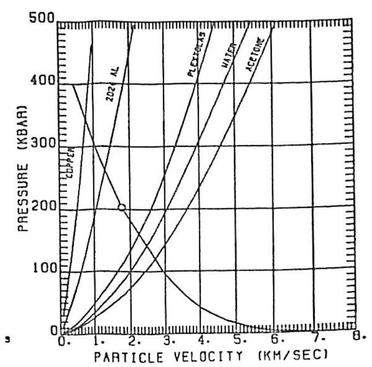
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
203.279	2.47158	1.64334	0.23619	1.49508	0.01676	0.00008	0.00686	0.00240	0.00012	0.00006	0.00299	5.12042
200.000	2.47068	1.64048	0.24296	1.49505	0.01742	0.00008	0.00702	0.00236	0.00012	0.00006	0.00287	5.11650
100.000	2.39444	1.46368	0.67698	1.49143	0.07747	0.00000	0.01676	0.00083	0.00018	0.00122	0.00038	4.85812
80.000	2.35237	1.39954	0.84781	1.48964	0.11118	0.00000	0.02053	0.00054	0.00017	0.00265	0.00018	4.75000
60.000	2.28358	1.32262	1.07082	1.48728	0.16528	0.00000	0.02537	0.00029	0.00015	0.00643	0.00007	4.60013
50.000	2.23154	1.28014	1.20795	1.48587	0.20478	0.00000	0.02821	0.00019	0.00013	0.01060	0.00004	4.50131
40.000	2.16000	1.23707	1.36574	1.48439	0.25649	0.00000	0.03121	0.00011	0.00010	0.01829	0.00002	4.37893
30.000	2.06047	1.19826	1.54295	1.48314	0.32370	0.00000	0.03372	0.00005	0.00008	0.03259	0.00001	4.22626
20.000	1.89902	1.16925	1.76247	1.48225	0.41543	0.00000	0.03549	0.00002	0.00004	0.06614	0.00000	4.00220
10.000	1.62694	1.18278	2.00751	1.48369	0.52895	0.00000	0.03262	0.00000	0.00001	0.14758	0.00000	3.66213
8.000	1.54776	1.19647	2.05932	1.48460	0.55421	0.00000	0.03079	0.00000	0.00001	0.17592	0.00000	3.56830
6.000	1.45694	1.21941	2.10426	1.48591	0.57932	0.00000	0.02817	0.00000	0.00001	0.21074	0.00000	3.46559
5.000	1.40683	1.23694	2.11932	1.48677	0.59133	0.00000	0.02646	0.00000	0.00001	0.23107	0.00000	3.41267
4.000	1.35191	1.25908	2.12996	1.48779	0.60396	0.00000	0.02442	0.00000	0.00000	0.25375	0.00000	3.35721
3.000	1.29220	1.28973	2.12837	1.48905	0.61693	0.00000	0.02191	0.00000	0.00000	0.27900	0.00000	3.30290
2.000	1.22656	1.33576	2.10196	1.49063	0.63110	0.00000	0.01873	0.00000	0.00000	0.30712	0.00000	3.25516
1.000	1.15432	1.41956	2.00660	1.49285	0.64950	0.00000	0.01430	0.00000	0.00000	0.33737	0.00000	3.23647
0.800	1.13958	1.44719	1.96608	1.49345	0.65494	0.00000	0.01311	0.00000	0.00000	0.34290	0.00000	3.24384
0.600	1.12619	1.48385	1.90616	1.49414	0.66155	0.00000	0.01172	0.00000	0.00000	0.34734	0.00000	3.26268
0.500	1.12061	1.50748	1.86449	1.49455	0.66573	0.00000	0.01091	0.00000	0.00000	0.34865	0.00000	3.27940
0.400	1.11663	1.53684	1.80974	1.49501	0.67079	0.00000	0.00999	0.00000	0.00000	0.34880	0.00000	3.30463
0.300	1.11560	1.57523	1.73399	1.49556	0.67744	0.00000	0.00890	0.00000	0.00000	0.34681	0.00000	3.34399
0.200	1.12076	1.63019	1.61893	1.49624	0.68673	0.00000	0.00754	0.00000	0.00000	0.34060	0.00000	3.41029
0.100	1.14159	1.72494	1.40860	1.49719	0.70152	0.00000	0.00564	0.00000	0.00000	0.32422	0.00000	3.54228
0.080	1.14989	1.75456	1.34106	1.49744	0.70621	0.00000	0.00513	0.00000	0.00000	0.31811	0.00000	3.58630
0.060	1.16238	1.79386	1.24997	1.49774	0.71041	0.00000	0.00453	0.00000	0.00000	0.31021	0.00000	3.64595
0.050	1.16942	1.81663	1.19739	1.49791	0.71425	0.00000	0.00419	0.00000	0.00000	0.30503	0.00000	3.68095
0.040	1.18000	1.84637	1.12733	1.49810	0.71638	0.00000	0.00381	0.00000	0.00000	0.29896	0.00000	3.72736
0.030	1.19291	1.88243	1.04231	1.49833	0.71968	0.00000	0.00336	0.00000	0.00000	0.29119	0.00000	3.78409
0.020	1.21171	1.93120	0.92598	1.49860	0.72277	0.00000	0.00282	0.00000	0.00000	0.28065	0.00000	3.86218
0.010	1.24552	2.00802	0.73853	1.49896	0.72293	0.00000	0.00209	0.00000	0.00000	0.26421	0.00000	3.98926
0.008	1.25704	2.03071	0.68164	1.49906	0.72133	0.00000	0.00190	0.00000	0.00000	0.25940	0.00000	4.02827
0.006	1.27245	2.05833	0.61099	1.49917	0.71793	0.00000	0.00168	0.00000	0.00000	0.25356	0.00000	4.07713
0.005	1.28262	2.07478	0.56792	1.49924	0.71490	0.00000	0.00155	0.00000	0.00000	0.25008	0.00000	4.10721
0.004	1.29557	2.09377	0.51700	1.49931	0.71021	0.00000	0.00141	0.00000	0.00000	0.24606	0.00000	4.14317
0.003	1.31329	2.11615	0.45451	1.49939	0.70235	0.00000	0.00124	0.00000	0.00000	0.24125	0.00000	4.18810
0.002	1.34028	2.14351	0.37282	1.49949	0.68763	0.00000	0.00104	0.00000	0.00000	0.23527	0.00000	4.24840
300.000	2.48186	1.67702	0.14534	1.49155	0.00802	0.00061	0.00485	0.00551	0.00013	0.00001	0.01204	5.17763
400.000	2.48289	1.67806	0.11125	1.48087	0.00520	0.00258	0.00433	0.01065	0.00016	0.00001	0.03394	5.21069
500.000	2.47901	1.65503	0.10361	1.46056	0.00440	0.00730	0.00477	0.01861	0.00022	0.00001	0.07412	5.24135

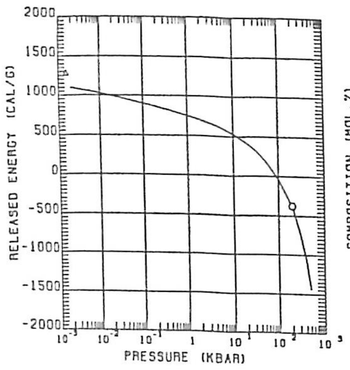
PRESS ;KBAR, PRODUCTS ;MOLES

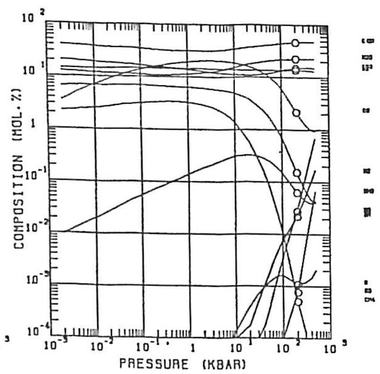
K-H-T ISENTROPE THRU C-J POINT











TNT

RHO (G/CC)	1.640
E_0 (KCAL/MOLE)	-14.19
D_{C-J} (M/SEC)	6989.
P_{C-J} (KBAR)	203.3
T_{C-J} (K)	3420.

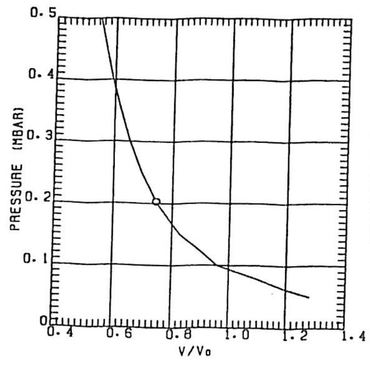
DATE 82-10-21

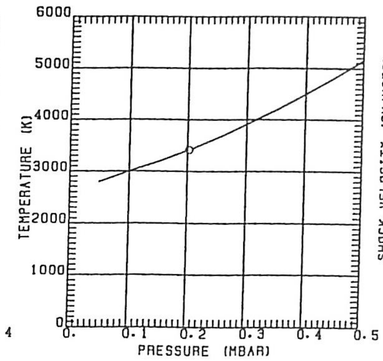
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

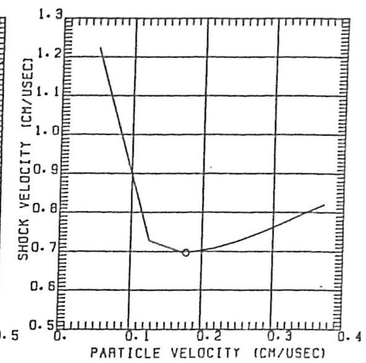
TNT RHO = 1.6400 G/CC, EO = -1.419400E+04 CAL/MOLE

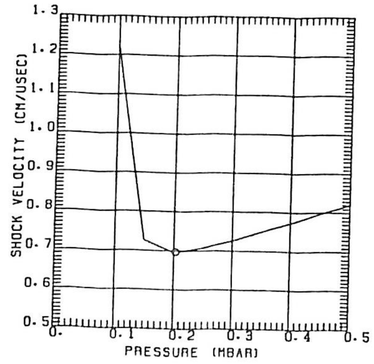
PRESSURE (KBAR)		500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3332	0.3466	0.3615	0.3785	0.3987	0.4237	0.4566	0.5043	0.5849	0.7790
TEMP	(DEG K)	5156.5	4811.7	4495.5	4194.4	3909.7	3645.0	3404.7	3192.1	3002.8	2792.4
US	(M/SEC)	8198.1	7973.4	7739.6	7501.8	7269.5	7067.6	6968.2	7271.4	12237.8	0.0
UP	(M/SEC)	3718.9	3441.3	3151.4	2844.8	2516.4	2156.9	1750.1	1257.8	498.3	0.0
H2O	(MOLE)	2.4663	2.4703	2.4754	2.4784	2.4793	2.4776	2.4711	2.4531	2.3966	2.1331
CO2	(MOLE)	1.6152	1.6293	1.6507	1.6634	1.6675	1.6620	1.6420	1.5925	1.4689	1.1360
CO	(MOLE)	0.1664	0.1599	0.1539	0.1547	0.1640	0.1875	0.2396	0.3593	0.6644	1.5945
N2	(MOLE)	1.4509	1.4600	1.4742	1.4842	1.4904	1.4938	1.4951	1.4946	1.4916	1.4823
H2	(MOLE)	0.0080	0.0077	0.0076	0.0081	0.0092	0.0117	0.0172	0.0312	0.0758	0.2816
O2	(MOLE)	0.0091	0.0071	0.0038	0.0018	0.0007	0.0003	0.0001	0.0000	0.0000	0.0000
NH3	(MOLE)	0.0076	0.0066	0.0059	0.0055	0.0054	0.0058	0.0069	0.0097	0.0165	0.0353
OH	(MOLE)	0.0281	0.0236	0.0160	0.0104	0.0065	0.0039	0.0023	0.0014	0.0008	0.0004
H	(MOLE)	0.0005	0.0004	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0002	0.0003
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0012	0.0160
NO	(MOLE)	0.0906	0.0734	0.0458	0.0262	0.0137	0.0065	0.0028	0.0011	0.0004	0.0001
C(S)	(MOLE)	5.2184	5.2108	5.1954	5.1819	5.1685	5.1505	5.1183	5.0480	4.8655	4.2535

K-H-T HUGONIOT









TNT

RHO (G/CC)	1.640
E_0 (KCAL/MOLE)	-14.19

DATE 82-10-21

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES		TETRYL	# TETRYL	# TETRYL	# TETRYL	# TETRYL	# TETRYL	# TETRYL	#
RHO	(G/CC)	1.700	1.550	1.600	1.400	1.200	1.000	0.800	
EO	(KCAL/MOLE)	8.07	8.07	8.07	8.07	8.07	8.07	8.07	
MOL.WEIGHT	(G)	287.146	287.146	287.146	287.146	287.146	287.146	287.146	
C		7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	
H		5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
N		5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
O		8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
DETN.VEL	(M/SEC)	7570.8	7118.6	7270.1	6678.7	6108.0	5551.6	4986.4	
PARTICL.VEL(	")	1939.8	1804.4	1812.0	1716.9	1660.4	1573.6	1454.6	
C-J PRESS	(KBAR)	249.7	199.1	210.8	160.5	121.7	87.4	58.0	
C-J VOLUME	(CC/G)	0.43751	0.48163	0.46923	0.53066	0.60680	0.71655	0.88537	
C-J TEMP	(DEG K)	3790.6	3837.4	3804.5	3875.1	3908.2	3867.2	3761.3	
C-J S	(CAL/DEG MOL)	61.46	61.21	61.28	60.46	58.76	56.18	53.14	
C-J ENERGY	(CAL/G)	449.68	389.07	392.35	352.27	329.45	295.92	252.84	
GAMMA		2.903	2.945	3.012	2.890	2.679	2.528	2.428	
C-J DETN.HEAT	(CAL)	1402.1	1377.9	1386.7	1341.0	1272.7	1179.1	1064.3	
LAMDA		9.9971	9.9098	9.9407	9.7844	9.5745	9.3305	9.0952	
VOLUM	(K LITTRE/KG)	0.6755	0.6903	0.6851	0.7130	0.7552	0.8144	0.8894	
TOTAL PRODCT	(MOLE)	12.0033	11.9973	11.9989	11.9890	11.9717	11.9365	11.8644	
V GAS	(MOLES)	7.9279	8.1026	8.0405	8.3681	8.8636	9.5588	10.4395	
V GAS	(CC/MOLE)	14.1143	15.3110	14.9917	16.5237	18.1975	20.4223	23.7121	
V SOL C(S)	(CC/G)	0.28062	0.30443	0.29863	0.32438	0.34682	0.36917	0.39094	
H2O	(MOL %)	20.5942	20.3677	20.4529	19.9636	18.9922	17.0395	13.4400	
CO2	(MOL %)	21.5191	20.2762	20.7192	18.4383	15.2134	11.2475	7.2465	
CO	(MOL %)	2.8457	5.6055	4.6288	9.7418	17.2726	27.3849	39.4317	
N2	(MOL %)	20.7436	20.7442	20.7479	20.7378	20.7231	20.7185	20.7725	
H2	(MOL %)	0.1183	0.2839	0.2219	0.5997	1.3940	3.0371	6.0748	
O2	(MOL %)	0.0043	0.0028	0.0030	0.0019	0.0011	0.0004	0.0001	
NH3	(MOL %)	0.0584	0.1001	0.0855	0.1589	0.2673	0.4204	0.5834	
OH	(MOL %)	0.0522	0.0628	0.0575	0.0717	0.0786	0.0700	0.0491	
H	(MOL %)	0.0019	0.0044	0.0034	0.0092	0.0208	0.0398	0.0649	
CH4	(MOL %)	0.0003	0.0014	0.0009	0.0052	0.0229	0.0910	0.3123	
NO	(MOL %)	0.1097	0.0876	0.0892	0.0704	0.0517	0.0308	0.0147	
C(S)	(MOL %)	33.9524	32.4634	32.9898	30.2016	25.9623	19.9200	12.0100	

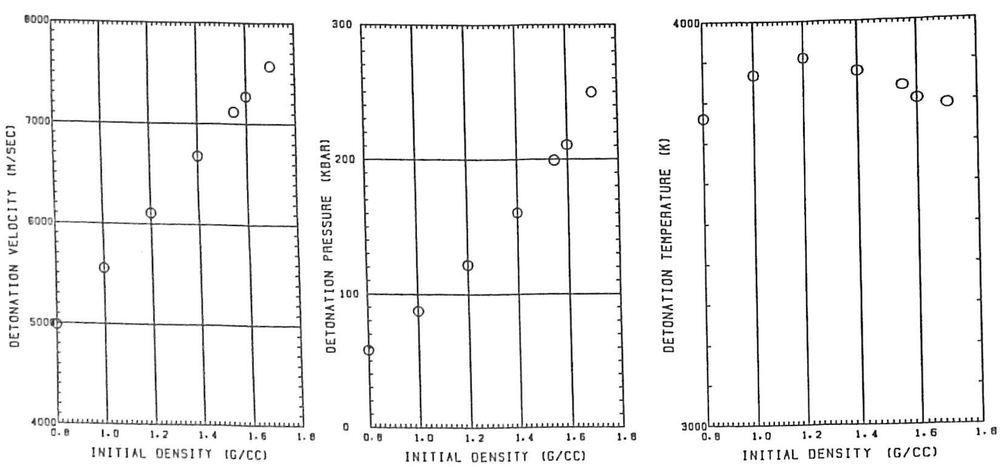
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-13>> **********

EXPLOSIVES	TETRYL	#
RHO (G/CC)	1.730	
EO (KCAL/MOLE)	8.07	
MOL.WEIGHT (G)	287.146	
C	7.0000	
H	5.0000	
N	5.0000	
O	8.0000	
DETN.VEL (M/SEC)	7663.1	
PARTICL.VEL(")	1909.3	
C-J PRESS (KBAR)	253.1	
C-J VOLUME (CC/G)	0.43401	
C-J TEMP (DEG K)	3744.9	
C-J S(CAL/DEG MOL)	61.33	
C-J ENERGY (CAL/G)	435.65	
GAMMA	3.013	
C-J DETN.HEAT(CAL)	1405.1	
LAMDA	10.0073	
VOLUM(K LITTRE/KG)	0.6738	
TOTAL PRODCT(MOLE)	12.0031	
V GAS (MOLES)	7.9090	
V GAS (CC/MOLE)	14.0236	
V SOL C(S) (CC/G)	0.27888	
H2O (MOL %)	20.6197	
CO2 (MOL %)	21.6629	
CO (MOL %)	2.5460	
N2 (MOL %)	20.7498	
H2 (MOL %)	0.1036	
O2 (MOL %)	0.0040	
NH3 (MOL %)	0.0533	
OH (MOL %)	0.0469	
H (MOL %)	0.0015	
CH4 (MOL %)	0.0002	
NO (MOL %)	0.1029	
C(S) (MOL %)	34.1090	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



O TETRYL

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

TETRYL RHO = 1.7000 G/CC EO = 8.067500E+03 CAL/MOLE

LN P = -3.62139893 E+00 -2.41093254 E+00LN V 3.27416718 E-01LN V*2 -3.31437886 E-02LN V*3 1.05738267 E-03LN V*4

LN T = 7.76463032 E+00 -4.68852043 E-01LN V 1.40084863 E-01LN V*2 -2.25154683 E-02LN V*3 1.29471277 E-03LN V*4

LN E = -1.60894775 E+00 4.51804757 E-01LNP 7.11855888 E-02LN P*2 5.46779484 E-03LN P*3 1.54692636 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (540.870)	0.3419	4784.6 (4715.8)	-1306.1	0.15465 (0.15112)	3.2334	392.9
400.000 (415.915)	0.3712	4390.4 (4402.9)	-964.5	0.14036 (0.13984)	3.1617	941.3
300.000 (303.652)	0.4106	4000.2 (4062.9)	-626.5	0.12621 (0.12759)	3.0756	1571.8
* 249.665 (249.993)	0.4376	3790.6 (3870.1)	-448.9	0.11878 (0.12089)	3.0223	1939.8
200.000 (196.369)	0.4745	3638.8 (3647.5)	-300.2	0.11256 (0.11378)	2.9562	2383.6
100.000 (95.344)	0.6110	3132.8 (3079.0)	78.9	0.09670 (0.09688)	2.7581	3545.0
80.000 (76.056)	0.6638	2977.3 (2927.3)	174.4	0.09270 (0.09276)	2.6962	3863.8
60.000 (57.138)	0.7393	2786.5 (2750.9)	282.4	0.08818 (0.08815)	2.6179	4240.9
50.000 (47.746)	0.7923	2673.2 (2648.3)	342.9	0.08565 (0.08560)	2.5688	4463.8
40.000 (38.407)	0.8632	2543.8 (2531.9)	408.9	0.08289 (0.08279)	2.5094	4720.9
30.000 (28.757)	0.9705	2393.3 (2389.4)	482.8	0.07980 (0.07964)	2.4306	5042.0
20.000 (19.599)	1.1403	2204.7 (2220.4)	570.5	0.07613 (0.07592)	2.3267	5434.9
10.000 (10.156)	1.5298	1949.2 (1976.2)	685.3	0.07133 (0.07105)	2.1502	6034.7
8.000 (8.200)	1.6921	1881.9 (1907.6)	715.3	0.07007 (0.06979)	2.0934	6212.7
6.000 (6.208)	1.9373	1803.6 (1825.4)	750.3	0.06861 (0.06833)	2.0202	6433.2
5.000 (5.194)	2.1184	1758.5 (1776.7)	770.6	0.06776 (0.06749)	1.9736	6568.6
4.000 (4.167)	2.3724	1707.0 (1720.5)	794.1	0.06678 (0.06654)	1.9167	6729.9
3.000 (3.127)	2.7640	1646.3 (1653.2)	822.2	0.06560 (0.06541)	1.8435	6931.3
2.000 (2.075)	3.4746	1569.9 (1568.1)	858.5	0.06408 (0.06399)	1.7414	7203.2
1.000 (1.022)	5.3294	1458.5 (1446.6)	913.5	0.06178 (0.06184)	1.5738	7638.2
0.800 (0.813)	6.1803	1426.8 (1413.2)	929.6	0.06110 (0.06120)	1.5225	7771.4
0.600 (0.605)	7.5364	1387.7 (1373.6)	950.0	0.06025 (0.06040)	1.4591	7938.9
0.500 (0.501)	8.5854	1364.0 (1350.2)	962.6	0.05973 (0.05989)	1.4206	8043.0
0.400 (0.398)	10.1202	1335.8 (1323.3)	977.7	0.05909 (0.05929)	1.3755	8168.4
0.300 (0.296)	12.6089	1300.8 (1290.8)	996.8	0.05829 (0.05851)	1.3211	8327.3
0.200 (0.195)	17.4278	1253.4 (1248.4)	1023.3	0.05719 (0.05742)	1.2528	8546.3
0.100 (0.097)	31.1774	1177.1 (1181.2)	1067.2	0.05535 (0.05555)	1.1628	8907.2
0.080 (0.078)	37.7855	1153.6 (1160.1)	1081.0	0.05477 (0.05495)	1.1416	9019.8
0.060 (0.059)	48.5333	1124.4 (1132.8)	1098.2	0.05405 (0.05418)	1.1198	9162.8
0.050 (0.049)	56.9396	1106.5 (1115.4)	1108.9	0.05361 (0.05369)	1.1093	9252.3
0.040 (0.039)	69.2910	1084.9 (1093.8)	1121.7	0.05307 (0.05310)	1.0996	9360.7
0.030 (0.030)	89.3369	1058.0 (1065.8)	1137.7	0.05240 (0.05235)	1.0924	9498.9
0.020 (0.020)	127.9785	1021.3 (1025.9)	1159.6	0.05148 (0.05133)	1.0914	9691.2
0.010 (0.010)	237.0587	961.7 (958.8)	1195.0	0.05000 (0.04973)	1.1117	10014.9
0.008 (0.008)	289.1699	943.2 (938.3)	1205.9	0.04955 (0.04927)	1.1235	10117.8
0.006 (0.006)	373.6191	919.7 (913.2)	1219.5	0.04898 (0.04873)	1.1418	10249.5
0.005 (0.005)	439.4885	905.0 (898.4)	1227.9	0.04863 (0.04843)	1.1550	10332.3
0.004 (0.004)	536.0815	887.3 (881.7)	1237.9	0.04820 (0.04810)	1.1729	10432.9
0.003 (0.003)	692.4646	864.6 (863.0)	1250.6	0.04768 (0.04776)	1.1981	10561.2
0.002 (0.002)	992.8203	833.0 (843.2)	1267.7	0.04696 (0.04745)	1.2371	10738.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

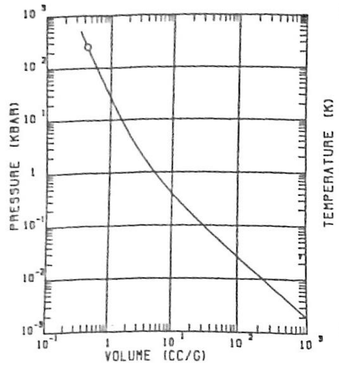
TETRYL RHO = 1.7000 G/CC EO = 8.067500E+03 CAL/MOLE

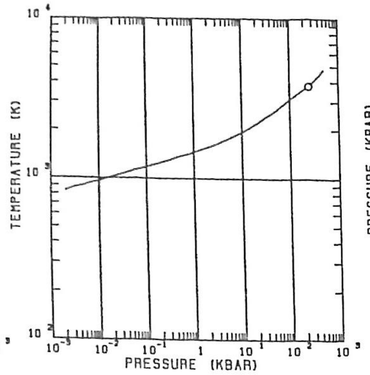
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

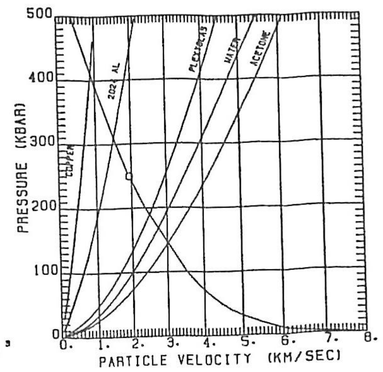
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
249.665	2.47178	2.58194	0.34395	2.48992	0.01432	0.00051	0.00706	0.00627	0.00023	0.00004	0.01311	4.07408
200.000	2.45887	2.51208	0.50448	2.49172	0.02441	0.00021	0.00932	0.00483	0.00028	0.00009	0.00724	3.98335
100.000	2.37932	2.21452	1.18935	2.49043	0.08988	0.00001	0.01829	0.00143	0.00032	0.00124	0.00085	3.59490
80.000	2.33772	2.11127	1.43845	2.48903	0.12442	0.00000	0.02154	0.00088	0.00029	0.00249	0.00040	3.44782
60.000	2.27302	1.99137	1.74365	2.48717	0.17738	0.00000	0.02551	0.00045	0.00023	0.00550	0.00015	3.25952
50.000	2.22504	1.92429	1.92603	2.48605	0.21560	0.00000	0.02783	0.00028	0.00019	0.00869	0.00008	3.14105
40.000	2.16006	1.85448	2.13079	2.48484	0.26545	0.00000	0.03029	0.00016	0.00015	0.01445	0.00003	3.00028
30.000	2.07171	1.78983	2.34855	2.48384	0.32985	0.00000	0.03230	0.00008	0.00010	0.02495	0.00001	2.83668
20.000	1.92989	1.73133	2.60744	2.48303	0.41969	0.00000	0.03393	0.00003	0.00006	0.04974	0.00000	2.61150
10.000	1.68871	1.72049	2.87033	2.48407	0.53793	0.00000	0.03185	0.00000	0.00002	0.11279	0.00000	2.29640
8.000	1.61839	1.73391	2.91381	2.48485	0.56482	0.00000	0.03031	0.00000	0.00001	0.13566	0.00000	2.21662
6.000	1.53669	1.75995	2.94343	2.48599	0.59225	0.00000	0.02802	0.00000	0.00001	0.16451	0.00000	2.13211
5.000	1.49039	1.78006	2.94952	2.48675	0.60631	0.00000	0.02649	0.00000	0.00001	0.18178	0.00000	2.08864
4.000	1.44030	1.80880	2.94214	2.48770	0.62017	0.00000	0.02460	0.00000	0.00000	0.20131	0.00000	2.04776
3.000	1.38555	1.85044	2.91361	2.48888	0.63415	0.00000	0.02223	0.00000	0.00000	0.22347	0.00000	2.01248
2.000	1.32529	1.91560	2.84355	2.49043	0.64861	0.00000	0.01915	0.00000	0.00000	0.24868	0.00000	1.99217
1.000	1.25924	2.03757	2.66567	2.49263	0.66532	0.00000	0.01474	0.00000	0.00000	0.27667	0.00000	2.02010
0.800	1.24572	2.07786	2.59861	2.49324	0.66991	0.00000	0.01354	0.00000	0.00000	0.28203	0.00000	2.04149
0.600	1.23387	2.13197	2.50225	2.49395	0.67490	0.00000	0.01212	0.00000	0.00000	0.28653	0.00000	2.07925
0.500	1.22919	2.16695	2.43696	2.49436	0.67781	0.00000	0.01128	0.00000	0.00000	0.28804	0.00000	2.10805
0.400	1.22614	2.21033	2.35325	2.49484	0.68124	0.00000	0.01033	0.00000	0.00000	0.28856	0.00000	2.14786
0.300	1.22632	2.26715	2.23942	2.49540	0.68535	0.00000	0.00921	0.00000	0.00000	0.28726	0.00000	2.20616
0.200	1.23303	2.34847	2.07010	2.49611	0.69060	0.00000	0.00780	0.00000	0.00000	0.28234	0.00000	2.29910
0.100	1.25696	2.48821	1.76668	2.49710	0.69709	0.00000	0.00581	0.00000	0.00000	0.26862	0.00000	2.47653
0.080	1.26708	2.53317	1.66666	2.49737	0.69796	0.00000	0.00528	0.00000	0.00000	0.26352	0.00000	2.53667
0.060	1.28048	2.58894	1.54172	2.49768	0.69898	0.00000	0.00466	0.00000	0.00000	0.25677	0.00000	2.61261
0.050	1.28932	2.62350	1.46375	2.49785	0.69923	0.00000	0.00431	0.00000	0.00000	0.25250	0.00000	2.66026
0.040	1.30052	2.66487	1.36983	2.49805	0.69901	0.00000	0.00391	0.00000	0.00000	0.24731	0.00000	2.71802
0.030	1.31540	2.71655	1.25159	2.49828	0.69779	0.00000	0.00345	0.00000	0.00000	0.24082	0.00000	2.79106
0.020	1.33733	2.78573	1.09131	2.49857	0.69409	0.00000	0.00289	0.00000	0.00000	0.23213	0.00000	2.89084
0.010	1.37801	2.89267	0.83675	2.49894	0.68110	0.00000	0.00213	0.00000	0.00000	0.21885	0.00000	3.05171
0.008	1.39225	2.92363	0.76059	2.49904	0.67477	0.00000	0.00193	0.00000	0.00000	0.21505	0.00000	3.10074
0.006	1.41165	2.96078	0.66689	2.49916	0.66477	0.00000	0.00170	0.00000	0.00000	0.21052	0.00000	3.16185
0.005	1.42473	2.98256	0.61026	2.49922	0.65728	0.00000	0.00157	0.00000	0.00000	0.20782	0.00000	3.19937
0.004	1.44151	3.00728	0.54404	2.49930	0.64676	0.00000	0.00143	0.00000	0.00000	0.20480	0.00000	3.24390
0.003	1.46480	3.03576	0.46381	2.49938	0.63084	0.00000	0.00126	0.00000	0.00000	0.20125	0.00000	3.29921
0.002	1.50112	3.06888	0.36124	2.49949	0.60341	0.00000	0.00105	0.00000	0.00000	0.19695	0.00000	3.37289
300.000	2.47627	2.60921	0.26968	2.48483	0.01001	0.00123	0.00608	0.00891	0.00023	0.00002	0.02427	4.12110
400.000	2.47826	2.62144	0.19341	2.46678	0.00608	0.00449	0.00525	0.01528	0.00024	0.00001	0.06119	4.18515
500.000	2.47544	2.59721	0.16339	2.43685	0.00461	0.01119	0.00539	0.02345	0.00027	0.00001	0.12092	4.23940

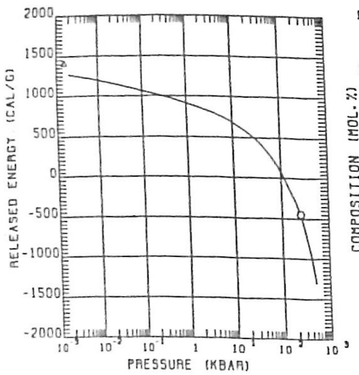
PRESS ;KBAR, PRODUCTS ;MOLES

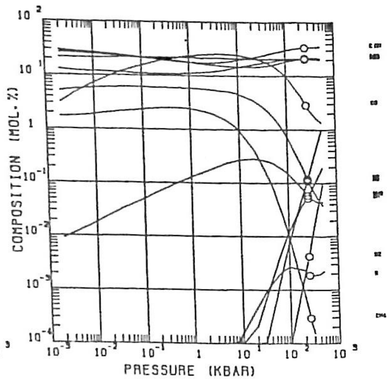
K-H-T ISENTROPE THRU C-J POINT











TETRYL
RHO (G/CC) 1.700
E_0 (KCAL/MOLE) 8.07
D_{C-J}(M/SEC) 7571.
P_{C-J}(KBAR) 249.7
T_{C-J}(K) 3791.

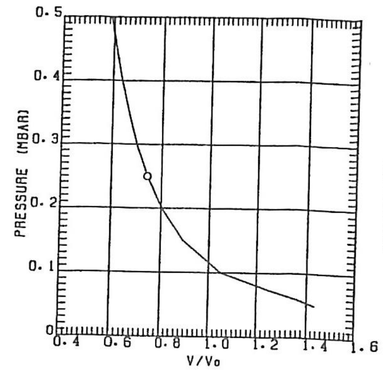
DATE 82-10-21

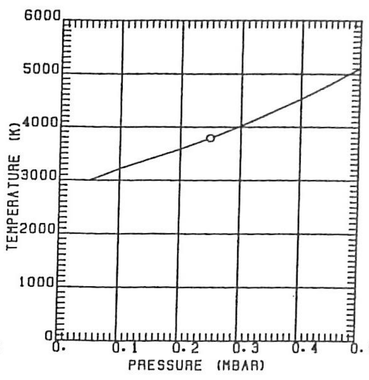
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

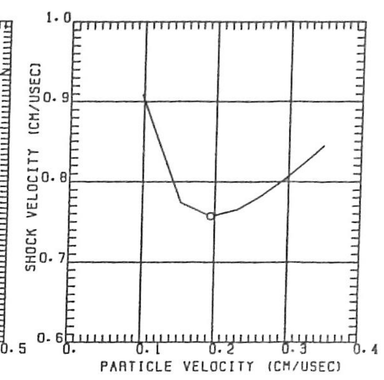
TETRYL RHO = 1.7000 G/CC, EO = 8.067500E+03 CAL/MOLE

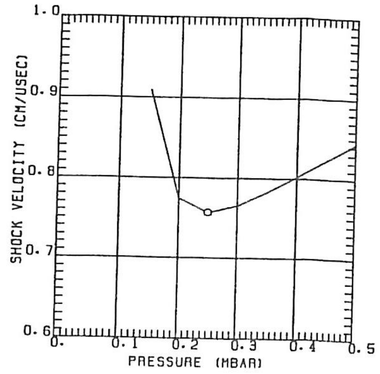
RESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
OLUME	(CC/G)	0.3457	0.3586	0.3732	0.3903	0.4110	0.4373	0.4727	0.5255	0.6173	0.8432
EMP	(DEG K)	5105.7	4806.0	4529.8	4267.6	4020.6	3791.8	3584.3	3398.2	3220.9	3001.4
S	(M/SEC)	8446.1	8234.4	8022.7	7822.2	7653.4	7570.0	7740.9	9094.9	0.0	0.0
P	(M/SEC)	3482.3	3214.6	2932.9	2632.0	2305.8	1942.7	1519.8	970.2	0.0	0.0
20	(MOLE)	2.4658	2.4694	2.4735	2.4756	2.4755	2.4721	2.4624	2.4370	2.3603	2.0236
02	(MOLE)	2.5529	2.5725	2.5965	2.6076	2.6048	2.5835	2.5314	2.4138	2.1414	1.4802
O	(MOLE)	0.2290	0.2282	0.2308	0.2459	0.2780	0.3403	0.4638	0.7295	1.3540	3.0148
2	(MOLE)	2.4258	2.4411	2.4607	2.4749	2.4844	2.4899	2.4924	2.4924	2.4892	2.4792
2	(MOLE)	0.0070	0.0071	0.0075	0.0085	0.0104	0.0141	0.0222	0.0424	0.1046	0.3777
2	(MOLE)	0.0134	0.0099	0.0056	0.0028	0.0013	0.0005	0.0002	0.0001	0.0000	0.0000
H3	(MOLE)	0.0074	0.0067	0.0062	0.0060	0.0062	0.0070	0.0087	0.0123	0.0205	0.0413
H	(MOLE)	0.0317	0.0265	0.0192	0.0135	0.0093	0.0063	0.0042	0.0029	0.0019	0.0009
	(MOLE)	0.0005	0.0004	0.0003	0.0003	0.0002	0.0002	0.0002	0.0003	0.0005	0.0008
H4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0016	0.0179
O	(MOLE)	0.1411	0.1111	0.0724	0.0441	0.0250	0.0132	0.0065	0.0029	0.0011	0.0002
(S)	(MOLE)	4.2182	4.1993	4.1727	4.1464	4.1172	4.0761	4.0048	3.8564	3.5031	2.4871

K-H-T HUGONIOT









TETRYL
RHO (G/CC) 1.700
E_0 (KCAL/MOLE) 8.07

DATE 82-10-21

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES		PETN	# PETN	# PETN	# PETN	# PETN	# PETN	# PETN	#
RHO	(G/CC)	1.760	1.700	1.600	1.400	1.200	1.000	0.800	
EO	(KCAL/MOLE)	-127.20	-127.20	-127.20	-127.20	-127.20	-127.20	-127.20	
MOL.WEIGHT	(G)	316.139	316.139	316.139	316.139	316.139	316.139	316.139	
C		5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
H		8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
N		4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	
O		12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	
DETN.VEL	(M/SEC)	8289.1	8092.5	7772.5	7164.6	6521.8	5757.2	4989.8	
PARTICL.VEL(	")	2075.8	2044.7	1997.2	1899.9	1750.7	1564.4	1377.7	
C-J PRESS	(KBAR)	302.8	281.3	248.4	190.6	137.0	90.1	55.0	
C-J VOLUME	(CC/G)	0.42590	0.43961	0.46440	0.52487	0.60963	0.72828	0.90488	
C-J TEMP	(DEG K)	3667.9	3729.4	3819.5	3941.0	4036.4	4201.8	4316.7	
C-J S	(CAL/DEG MOL)	56.21	56.43	56.66	56.36	55.96	56.88	57.68	
C-J ENERGY	(CAL/G)	514.93	499.61	476.66	431.38	366.27	292.45	226.82	
GAMMA		2.993	2.958	2.892	2.771	2.725	2.680	2.622	
C-J DETN.HEAT	(CAL)	1499.9	1493.8	1479.9	1433.3	1384.5	1370.4	1346.8	
LAMDA		9.9499	9.9317	9.8899	9.7537	9.6174	9.5853	9.5424	
VOLUM	(K LITTRE/KG)	0.7824	0.7859	0.7941	0.8222	0.8512	0.8543	0.8586	
TOTAL PRODCT	(MOLE)	11.0070	11.0062	11.0041	10.9953	10.9989	11.0393	11.0950	
V GAS	(MOLES)	10.1105	10.1557	10.2611	10.6243	10.9990	11.0393	11.0950	
V GAS	(CC/MOLE)	13.0433	13.4167	14.0634	15.4884	17.5225	20.8562	25.7836	
V SOL C(S)	(CC/G)	0.25706	0.26649	0.28133	0.30915	0.33844	0.36965	0.39839	
H2O	(MOL %)	36.1742	36.1131	35.9682	35.4184	34.6947	34.3078	33.6886	
CO2	(MOL %)	35.3550	34.9914	34.1551	31.3663	28.5985	28.2481	27.6841	
CO	(MOL %)	1.9256	2.7091	4.5296	10.7303	16.8544	17.0438	17.3816	
N2	(MOL %)	18.0804	18.0747	18.0650	18.0466	18.0207	17.9116	17.7089	
H2	(MOL %)	0.0724	0.1100	0.2079	0.6304	1.2631	1.5142	1.7779	
O2	(MOL %)	0.0082	0.0079	0.0073	0.0053	0.0072	0.0347	0.1165	
NH3	(MOL %)	0.0427	0.0557	0.0837	0.1683	0.1879	0.0974	0.0542	
OH	(MOL %)	0.0585	0.0702	0.0910	0.1286	0.2031	0.4719	0.9055	
H	(MOL %)	0.0010	0.0016	0.0032	0.0105	0.0263	0.0555	0.1022	
CH4	(MOL %)	0.0001	0.0002	0.0006	0.0043	0.0064	0.0013	0.0003	
NO	(MOL %)	0.1370	0.1380	0.1363	0.1177	0.1378	0.3137	0.5802	
C(S)	(MOL %)	8.1450	7.7281	6.7522	3.3734	0.0	0.0	0.0	

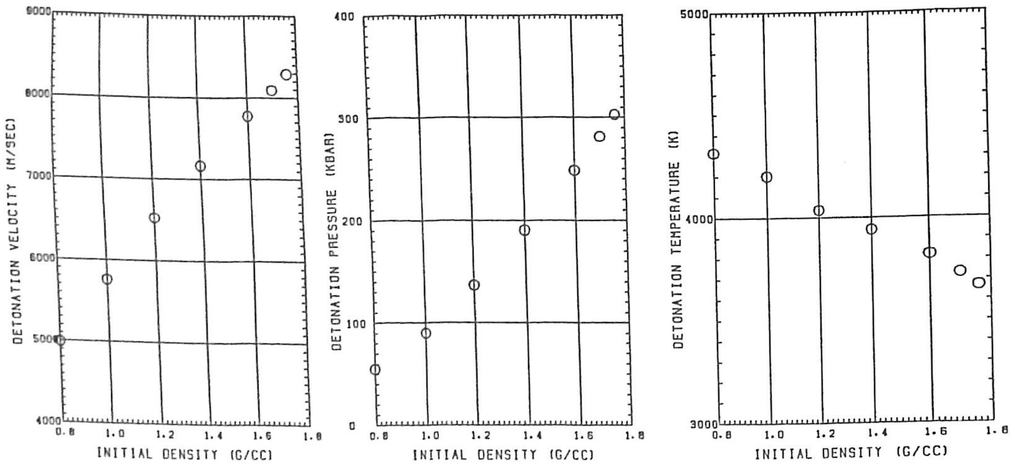
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

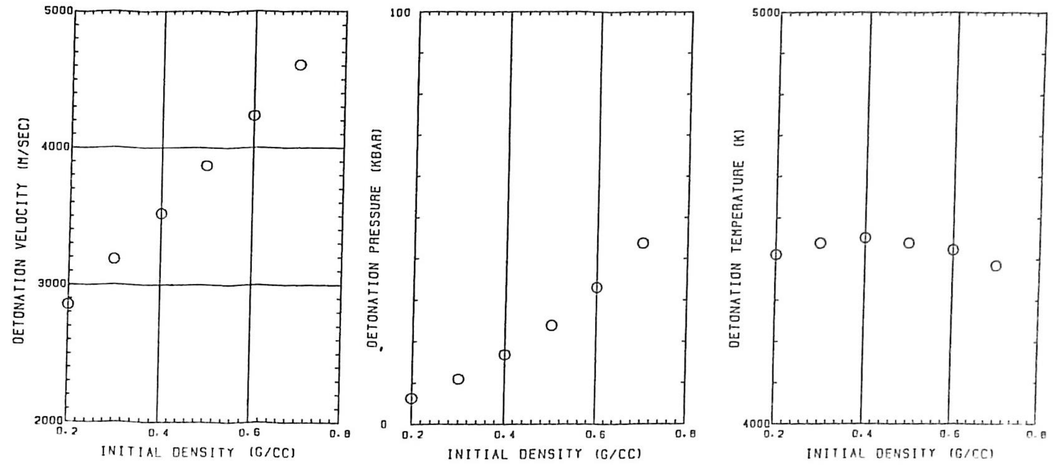
EXPLOSIVES	PETN	# PETN	# PETN	# PETN	# PETN	# PETN	#
RHO (G/CC)	0.700	0.600	0.500	0.400	0.300	0.200	
EO (KCAL/MOLE)	-127.20	-127.20	-127.20	-127.20	-127.20	-127.20	
MOL.WEIGHT (G)	316.139	316.139	316.139	316.139	316.139	316.139	
C	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	
H	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	
N	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	
O	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	
DETN.VEL (M/SEC)	4606.2	4232.1	3867.6	3518.3	3182.7	2854.7	
PARTICL.VEL(")	1356.4	1303.1	1236.5	1196.7	1141.6	1103.0	
C-J PRESS (KBAR)	43.7	33.1	23.9	16.8	10.9	6.3	
C-J VOLUME (CC/G)	1.00790	1.15350	1.36064	1.64971	2.13783	3.06837	
C-J TEMP (DEG K)	4383.6	4421.7	4438.3	4450.6	4438.1	4410.3	
C-J S(CAL/DEG MOL)	58.06	58.41	58.76	59.13	59.56	60.10	
C-J ENERGY (CAL/G)	219.86	202.92	182.70	171.14	155.74	145.39	
GAMMA	2.396	2.248	2.128	1.940	1.788	1.588	
C-J DETN.HEAT(CAL)	1329.7	1310.5	1289.4	1264.7	1237.2	1202.7	
LAMDA	9.5132	9.4805	9.4447	9.4032	9.3573	9.3000	
VOLUM(K LITTRE/KG)	0.8616	0.8649	0.8686	0.8729	0.8777	0.8839	
TOTAL PRODCT(MOLE)	11.1332	11.1763	11.2240	11.2798	11.3424	11.4214	
V GAS (MOLES)	11.1332	11.1763	11.2240	11.2798	11.3424	11.4214	
V GAS (CC/MOLE)	28.6206	32.6286	38.3244	46.2365	59.5865	84.9314	
H2O (MOL %)	33.2909	32.8437	32.3564	31.8071	31.2015	30.4600	
CO2 (MOL %)	27.2401	26.7395	26.1833	25.5207	24.7861	23.8625	
CO (MOL %)	17.6709	17.9981	18.3641	18.8063	19.2964	19.9151	
N2 (MOL %)	17.5636	17.4095	17.2504	17.0733	16.8923	16.6813	
H2 (MOL %)	1.9060	2.0497	2.2034	2.3661	2.5444	2.7540	
O2 (MOL %)	0.1933	0.2963	0.4268	0.5943	0.8010	1.0808	
NH3 (MOL %)	0.0431	0.0337	0.0259	0.0199	0.0144	0.0098	
OH (MOL %)	1.1991	1.5197	1.8619	2.2463	2.6589	3.1548	
H (MOL %)	0.1345	0.1723	0.2164	0.2708	0.3379	0.4320	
CH4 (MOL %)	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	
NO (MOL %)	0.7584	0.9374	1.1113	1.2952	1.4670	1.6497	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

PETN RHO = 1.7600 G/CC EO = -1.272000E+05 CAL/MOLE

LN P = -3.50386810 E+00 -2.41163921 E+00LN V 3.27307284 E-01LN V*2 -3.52866277 E-02LN V*3 1.27398013 E-03LN V*4

LN T = 7.78556442 E+00 -3.99283051 E-01LN V 1.04938626 E-01LN V*2 -1.92065947 E-02LN V*3 1.24732614 E-03LN V*4

LN E = -1.62019348 E+00 4.80911791 E-01LNP 7.48611689 E-02LN P*2 5.81198186 E-03LN P*3 1.67387218 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (619.957)	0.3403	4508.8 (4288.2)	-1438.4	0.16018 (0.15770)	3.2466	481.0
500.000 (511.825)	0.3612	4233.1 (4116.1)	-1135.9	0.14752 (0.14669)	3.1935	946.2
400.000 (406.726)	0.3884	3960.0 (3921.6)	-829.8	0.13472 (0.13502)	3.1297	1472.3
* 302.833 (305.855)	0.4259	3667.9 (3697.3)	-514.4	0.12152 (0.12277)	3.0506	2075.8
300.000 (302.868)	0.4273	3663.2 (3689.9)	-507.4	0.12123 (0.12240)	3.0479	2096.0
200.000 (197.086)	0.4934	3388.7 (3384.9)	-189.5	0.10793 (0.10824)	2.9287	2928.9
100.000 (96.279)	0.6356	2900.2 (2951.0)	220.6	0.09077 (0.09100)	2.7305	4112.9
80.000 (76.788)	0.6912	2751.7 (2830.9)	322.7	0.08650 (0.08680)	2.6681	4441.6
60.000 (57.606)	0.7711	2569.5 (2688.7)	438.0	0.08167 (0.08212)	2.5891	4832.3
50.000 (48.166)	0.8268	2482.4 (2605.6)	499.6	0.07910 (0.07951)	2.5400	5061.5
40.000 (38.826)	0.9009	2418.3 (2510.9)	562.3	0.07647 (0.07666)	2.4811	5324.3
30.000 (29.439)	1.0090	2340.1 (2397.1)	633.3	0.07350 (0.07344)	2.4058	5642.2
20.000 (19.958)	1.1902	2235.1 (2250.9)	718.4	0.06994 (0.06963)	2.3008	6055.3
10.000 (10.228)	1.6106	2063.9 (2032.6)	834.3	0.06509 (0.06460)	2.1231	6687.5
8.000 (8.222)	1.7875	2009.9 (1969.3)	865.8	0.06377 (0.06328)	2.0662	6875.6
6.000 (6.187)	2.0564	1940.6 (1892.0)	903.3	0.06221 (0.06175)	1.9928	7109.0
5.000 (5.158)	2.2555	1896.8 (1845.4)	925.5	0.06128 (0.06086)	1.9465	7252.1
4.000 (4.120)	2.5356	1843.6 (1790.7)	951.3	0.06020 (0.05984)	1.8901	7422.3
3.000 (3.078)	2.9678	1775.7 (1724.0)	982.3	0.05890 (0.05864)	1.8182	7634.0
2.000 (2.035)	3.7495	1682.3 (1637.0)	1022.6	0.05721 (0.05710)	1.7196	7918.0
1.000 (1.005)	5.7695	1530.1 (1504.9)	1083.7	0.05466 (0.05477)	1.5621	8367.2
0.800 (0.801)	6.6863	1483.9 (1466.0)	1101.5	0.05391 (0.05407)	1.5151	8503.7
0.600 (0.598)	8.1360	1425.5 (1417.8)	1123.8	0.05298 (0.05319)	1.4576	8674.5
0.500 (0.497)	9.2489	1389.5 (1388.2)	1137.4	0.05241 (0.05265)	1.4232	8780.3
0.400 (0.397)	10.8581	1345.9 (1352.9)	1154.0	0.05172 (0.05200)	1.3834	8907.1
0.300 (0.297)	13.4489	1293.0 (1308.2)	1174.4	0.05086 (0.05116)	1.3359	9067.8
0.200 (0.197)	18.4004	1223.3 (1246.5)	1202.2	0.04970 (0.05000)	1.2772	9288.6
0.100 (0.098)	32.2846	1117.7 (1142.8)	1246.9	0.04783 (0.04805)	1.2014	9652.3
0.080 (0.079)	38.8902	1086.8 (1109.8)	1260.6	0.04726 (0.04743)	1.1839	9765.9
0.060 (0.059)	49.5530	1048.9 (1067.7)	1277.8	0.04654 (0.04665)	1.1663	9909.7
0.050 (0.050)	57.8400	1025.8 (1041.2)	1288.4	0.04609 (0.04616)	1.1579	9999.5
0.040 (0.040)	69.9693	998.6 (1009.2)	1301.0	0.04557 (0.04557)	1.1505	10108.2
0.030 (0.030)	89.4377	964.2 (968.9)	1317.1	0.04489 (0.04482)	1.1452	10245.6
0.020 (0.020)	126.7409	918.7 (913.9)	1338.0	0.04402 (0.04383)	1.1454	10436.4
0.010 (0.010)	229.8108	843.9 (828.6)	1371.7	0.04261 (0.04232)	1.1628	10752.1
0.008 (0.008)	278.2422	820.4 (804.1)	1381.7	0.04219 (0.04190)	1.1721	10851.1
0.006 (0.006)	355.7041	790.3 (775.3)	1394.3	0.04166 (0.04141)	1.1862	10976.4
0.005 (0.005)	415.3735	771.2 (758.7)	1402.0	0.04134 (0.04114)	1.1961	11054.5
0.004 (0.004)	501.8787	747.8 (740.4)	1411.1	0.04096 (0.04086)	1.2091	11148.6
0.003 (0.003)	640.3662	718.3 (720.3)	1422.4	0.04049 (0.04058)	1.2269	11267.8
0.002 (0.002)	900.6538	676.6 (699.5)	1437.4	0.03986 (0.04037)	1.2531	11430.7

* ? C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

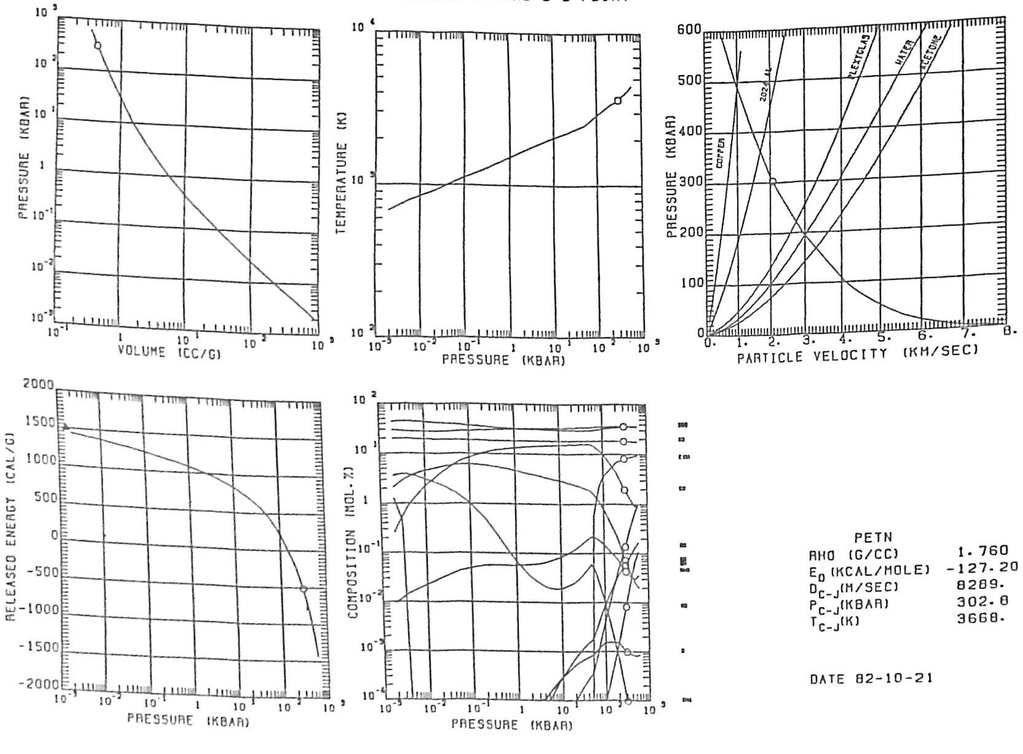
PETN RHO = 1.7600 G/CC EO = -1.272000E+05 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
302.833	3.98164	3.89120	0.21269	1.99012	0.00800	0.00089	0.00471	0.00644	0.00011	0.00001	0.01505	0.89611
300.000	3.98137	3.88960	0.21654	1.99024	0.00820	0.00087	0.00477	0.00640	0.00011	0.00001	0.01475	0.89385
200.000	3.96192	3.78248	0.46443	1.99357	0.02349	0.00016	0.00830	0.00382	0.00017	0.00008	0.00456	0.75301
100.000	3.88434	3.50066	1.11292	1.99143	0.08782	0.00001	0.01669	0.00098	0.00017	0.00112	0.00044	0.38532
80.000	3.84368	3.40345	1.34866	1.99001	0.12170	0.00000	0.01978	0.00057	0.00014	0.00230	0.00020	0.24561
60.000	3.77943	3.29149	1.63725	1.98811	0.17416	0.00000	0.02371	0.00027	0.00011	0.00533	0.00007	0.06597
50.000	3.74926	3.25696	1.73660	1.98815	0.20217	0.00000	0.02365	0.00019	0.00009	0.00648	0.00004	0.0
40.000	3.74013	3.26462	1.73045	1.99001	0.21990	0.00000	0.01994	0.00016	0.00008	0.00497	0.00003	0.0
30.000	3.72608	3.27744	1.71890	1.99183	0.24192	0.00000	0.01632	0.00012	0.00007	0.00371	0.00002	0.0
20.000	3.70362	3.29897	1.69836	1.99360	0.27167	0.00000	0.01279	0.00008	0.00006	0.00273	0.00001	0.0
10.000	3.66121	3.34085	1.65706	1.99536	0.32064	0.00000	0.00927	0.00003	0.00003	0.00211	0.00000	0.0
8.000	3.64653	3.35546	1.64253	1.99573	0.33647	0.00000	0.00854	0.00002	0.00003	0.00208	0.00000	0.0
6.000	3.62671	3.37537	1.62254	1.99609	0.35728	0.00000	0.00781	0.00001	0.00002	0.00214	0.00000	0.0
5.000	3.61348	3.38871	1.60910	1.99628	0.37086	0.00000	0.00744	0.00001	0.00002	0.00224	0.00000	0.0
4.000	3.59654	3.40587	1.59174	1.99646	0.38796	0.00000	0.00707	0.00001	0.00001	0.00244	0.00000	0.0
3.000	3.57321	3.42957	1.56766	1.99664	0.41103	0.00000	0.00671	0.00000	0.00001	0.00285	0.00000	0.0
2.000	3.53715	3.46665	1.52956	1.99681	0.44563	0.00000	0.00638	0.00000	0.00000	0.00382	0.00000	0.0
1.000	3.46468	3.54297	1.44940	1.99691	0.51074	0.00000	0.00617	0.00000	0.00000	0.00765	0.00000	0.0
0.800	3.43821	3.57169	1.41844	1.99692	0.53272	0.00000	0.00616	0.00000	0.00000	0.00991	0.00000	0.0
0.600	3.40092	3.61334	1.37244	1.99691	0.56133	0.00000	0.00619	0.00000	0.00000	0.01423	0.00000	0.0
0.500	3.37557	3.64246	1.33955	1.99690	0.57904	0.00000	0.00620	0.00000	0.00000	0.01804	0.00000	0.0
0.400	3.34194	3.68257	1.29295	1.99688	0.59970	0.00000	0.00624	0.00000	0.00000	0.02450	0.00000	0.0
0.300	3.29696	3.73848	1.22614	1.99690	0.62280	0.00000	0.00621	0.00000	0.00000	0.03546	0.00000	0.0
0.200	3.23048	3.82666	1.11626	1.99699	0.64618	0.00000	0.00604	0.00000	0.00000	0.05715	0.00000	0.0
0.100	3.11704	3.99227	0.89850	1.99733	0.65642	0.00000	0.00535	0.00000	0.00000	0.10926	0.00000	0.0
0.080	3.08257	4.04638	0.82475	1.99748	0.65203	0.00000	0.00506	0.00000	0.00000	0.12891	0.00000	0.0
0.060	3.04049	4.11520	0.72919	1.99768	0.64118	0.00000	0.00466	0.00000	0.00000	0.15567	0.00000	0.0
0.050	3.01560	4.15756	0.66937	1.99781	0.63163	0.00000	0.00440	0.00000	0.00000	0.17309	0.00000	0.0
0.040	2.98740	4.20698	0.59872	1.99797	0.61776	0.00000	0.00408	0.00000	0.00000	0.19436	0.00000	0.0
0.030	2.95436	4.26877	0.50819	1.99817	0.59402	0.00000	0.00368	0.00000	0.00000	0.22306	0.00000	0.0
0.020	2.91671	4.34441	0.39456	1.99844	0.55646	0.00000	0.00314	0.00000	0.00000	0.26106	0.00000	0.0
0.010	2.87658	4.44744	0.22866	1.99884	0.47188	0.00000	0.00234	0.00000	0.00000	0.32403	0.00000	0.0
0.008	2.87082	4.47195	0.18541	1.99896	0.44052	0.00000	0.00211	0.00000	0.00000	0.34276	0.00000	0.0
0.006	2.86864	4.49732	0.13685	1.99910	0.39686	0.00000	0.00183	0.00000	0.00000	0.36589	0.00000	0.0
0.005	2.87015	4.50973	0.11053	1.99918	0.36775	0.00000	0.00167	0.00000	0.00000	0.37980	0.00000	0.0
0.004	2.87481	4.52112	0.08309	1.99927	0.33119	0.00000	0.00149	0.00000	0.00000	0.39589	0.00000	0.0
0.003	2.93042	4.50764	0.05445	1.99938	0.28410	0.00000	0.00126	0.00000	0.00000	0.39180	0.00000	0.04610
0.002	3.03163	4.47070	0.02713	1.99953	0.21835	0.00000	0.00098	0.00000	0.00000	0.37429	0.00000	0.12787
400.000	3.98507	3.91173	0.13773	1.97962	0.00426	0.00319	0.00366	0.01025	0.00010	0.00000	0.03710	0.95053
500.000	3.98508	3.90554	0.10303	1.96272	0.00273	0.00764	0.00352	0.01431	0.00009	0.00000	0.07124	0.99144
600.000	3.98279	3.88598	0.09604	1.94437	0.00225	0.01196	0.00394	0.01798	0.00010	0.00000	0.10731	1.01798

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



PETN
RHO (G/CC) 1.760
E_0 (KCAL/MOLE) -127.20
D_{C-J} (M/SEC) 8289.
P_{C-J} (KBAR) 302.8
T_{C-J} (K) 3668.

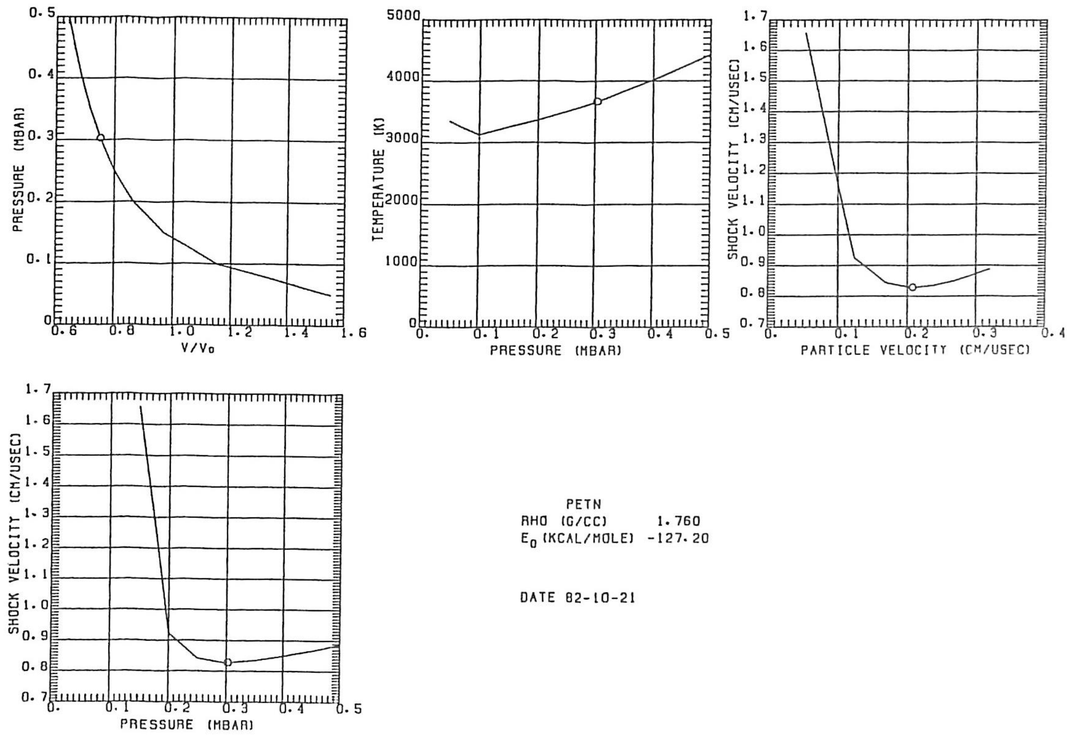
DATE 82-10-21

********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

PETN RHO = 1.7600 G/CC, EO = -1.272000E+05 CAL/MOLE

PRESSURE (KBAR)		500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3635	0.3754	0.3893	0.4062	0.4272	0.4546	0.4927	0.5505	0.6539	0.8831
TEMP	(DEG K)	4426.9	4217.3	4017.9	3830.7	3658.1	3503.1	3368.3	3249.9	3128.2	3343.6
US	(M/SEC)	8880.1	8680.1	8496.7	8350.8	8287.8	8429.9	9249.4	16567.4	0.0	0.0
UP	(M/SEC)	3199.2	2945.6	2674.8	2381.4	2056.7	1685.0	1228.6	514.4	0.0	0.0
H2O	(MOLE)	3.9795	3.9820	3.9834	3.9835	3.9816	3.9763	3.9633	3.9300	3.8251	3.7911
CO2	(MOLE)	3.8755	3.8932	3.9028	3.9029	3.8908	3.8595	3.7902	3.6362	3.2657	3.1955
CO	(MOLE)	0.1384	0.1412	0.1518	0.1736	0.2142	0.2911	0.4480	0.7926	1.6404	1.8044
N2	(MOLE)	1.9527	1.9669	1.9778	1.9854	1.9903	1.9930	1.9938	1.9926	1.9881	1.9937
H2	(MOLE)	0.0039	0.0041	0.0048	0.0059	0.0081	0.0125	0.0226	0.0490	0.1350	0.1902
O2	(MOLE)	0.0103	0.0063	0.0036	0.0018	0.0009	0.0004	0.0001	0.0001	0.0000	0.0002
NH3	(MOLE)	0.0043	0.0040	0.0040	0.0042	0.0047	0.0058	0.0081	0.0126	0.0229	0.0086
OH	(MOLE)	0.0201	0.0154	0.0115	0.0086	0.0063	0.0047	0.0036	0.0028	0.0021	0.0093
H	(MOLE)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0004	0.0017
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0003	0.0021	0.0002
NO	(MOLE)	0.0903	0.0622	0.0405	0.0250	0.0146	0.0082	0.0043	0.0022	0.0009	0.0039
C(S)	(MOLE)	0.9861	0.9655	0.9454	0.9235	0.8950	0.8494	0.7617	0.5709	0.0919	0.0

K-H-T HUGONIOT



PETN
RHO (G/CC) 1.760
E_0 (KCAL/MOLE) -127.20

DATE 82-10-21

EXPLOSIVES	TATB	# TATB	# TATB	# TATB	# TATB	# TATB	# DATB	#
RHO (G/CC)	1.860	1.700	1.600	1.400	1.200	1.000	1.780	
EO (KCAL/MOLE)	-33.40	-33.40	-33.40	-33.40	-33.40	-33.40	-23.60	
MOL.WEIGHT (G)	258.151	258.151	258.151	258.151	258.151	258.151	243.137	
C	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
H	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	5.0000	
N	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	5.0000	
O	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
DETN.VEL (M/SEC)	7928.4	7395.2	7057.4	6380.8	5722.8	5095.1	7612.6	
PARTICL.VEL(")	1984.3	1801.8	1757.5	1606.8	1499.7	1370.5	1899.3	
C-J PRESS (KBAR)	292.6	226.5	198.5	143.5	103.0	69.8	257.4	
C-J VOLUME (CC/G)	0.40308	0.44492	0.46936	0.53441	0.61496	0.73103	0.42164	
C-J TEMP (DEG K)	2731.1	2830.3	2911.9	3010.3	3067.2	3041.9	3054.2	
C-J S(CAL/DEG MOL)	55.18	56.11	56.68	57.27	57.05	55.74	58.27	
C-J ENERGY (CAL/G)	470.51	387.95	369.11	308.55	268.76	224.44	431.07	
GAMMA	2.996	3.104	3.016	2.971	2.816	2.718	3.008	
C-J DETN.HEAT(CAL)	1087.2	1084.2	1080.3	1062.4	1025.1	962.2	1168.3	
LAMDA	9.1573	9.1507	9.1418	9.1010	9.0202	8.9036	9.5033	
VOLUM(K LITTRE/KG)	0.7114	0.7132	0.7156	0.7265	0.7497	0.7902	0.6822	
TOTAL PRODCT(MOLE)	11.9996	11.9975	11.9952	11.9856	11.9651	11.9193	10.9990	
V GAS (MOLES)	7.5071	7.5261	7.5508	7.6660	7.9110	8.3381	6.7795	
V GAS (CC/MOLE)	12.0102	13.2145	13.9237	15.7701	17.8930	20.6938	13.0730	
V SOL C(S) (CC/G)	0.25751	0.28682	0.30033	0.32897	0.35329	0.37593	0.27404	
H2O (MOL %)	24.9792	24.9298	24.8644	24.5293	23.6747	21.7512	22.6638	
CO2 (MOL %)	12.4486	12.3285	12.1747	11.4988	10.2091	8.3799	15.6717	
CO (MOL %)	0.1142	0.4124	0.7931	2.5190	6.0385	11.8158	0.5155	
N2 (MOL %)	24.9918	24.9880	24.9828	24.9647	24.9361	24.9225	22.7080	
H2 (MOL %)	0.0071	0.0337	0.0737	0.3073	0.9581	2.4805	0.0281	
O2 (MOL %)	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0004	
NH3 (MOL %)	0.0091	0.0267	0.0461	0.1239	0.2685	0.4906	0.0226	
OH (MOL %)	0.0019	0.0033	0.0047	0.0073	0.0093	0.0085	0.0068	
H (MOL %)	0.0000	0.0001	0.0002	0.0008	0.0024	0.0053	0.0001	
CH4 (MOL %)	0.0000	0.0000	0.0001	0.0018	0.0157	0.0974	0.0000	
NO (MOL %)	0.0090	0.0078	0.0081	0.0067	0.0051	0.0029	0.0200	
C(S) (MOL %)	37.4390	37.2696	37.0520	36.0404	33.8825	30.0454	38.3631	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	DATB	# DATB	# DATB	# DATB	# DATB	# NQ	# NQ	#
RHO (G/CC)	1.700	1.600	1.400	1.200	1.000	1.710	1.600	
EO (KCAL/MOLE)	-23.60	-23.60	-23.60	-23.60	-23.60	-20.29	-20.29	
MOL.WEIGHT (G)	243.137	243.137	243.137	243.137	243.137	104.069	104.069	
C	6.0000	6.0000	6.0000	6.0000	6.0000	1.0000	1.0000	
H	5.0000	5.0000	5.0000	5.0000	5.0000	4.0000	4.0000	
N	5.0000	5.0000	5.0000	5.0000	5.0000	4.0000	4.0000	
O	6.0000	6.0000	6.0000	6.0000	6.0000	2.0000	2.0000	
DETN.VEL (M/SEC)	7354.7	7026.5	6376.5	5749.7	5148.0	8181.5	7756.6	
PARTICL.VEL(")	1769.0	1778.2	1639.0	1502.3	1414.8	1902.2	1840.3	
C-J PRESS (KBAR)	221.2	199.9	146.3	103.7	72.8	266.1	228.4	
C-J VOLUME (CC/G)	0.44675	0.46683	0.53069	0.61559	0.72519	0.44883	0.47672	
C-J TEMP (DEG K)	3074.7	3173.9	3253.9	3269.2	3246.1	1977.2	2117.9	
C-J S(CAL/DEG MOL)	58.54	59.04	59.18	58.29	56.54	44.08	45.17	
C-J ENERGY (CAL/G)	373.96	377.88	321.00	269.72	239.20	432.39	404.70	
GAMMA	3.158	2.951	2.891	2.827	2.639	3.301	3.215	
C-J DETN.HEAT(CAL)	1164.6	1158.2	1132.4	1083.4	1011.8	915.5	915.2	
LAMDA	9.4923	9.4741	9.3998	9.2691	9.1054	7.9565	7.9637	
VOLUM(K LITTRE/KG)	0.6845	0.6882	0.7040	0.7344	0.7800	0.9402	0.9401	
TOTAL PRODCT(MOLE)	10.9974	10.9956	10.9872	10.9698	10.9349	4.9966	4.9927	
V GAS (MOLES)	6.8022	6.8392	6.9960	7.2987	7.7515	3.9994	3.9992	
V GAS (CC/MOLE)	13.8178	14.4001	16.1909	18.3673	20.8958	10.8836	11.5615	
V SOL C(S) (CC/G)	0.29038	0.30086	0.32877	0.35419	0.37520	0.26567	0.28283	
H2O (MOL %)	22.6181	22.5408	22.1742	21.2825	19.4915	39.9143	39.8016	
CO2 (MOL %)	15.5047	15.2296	14.1235	12.1751	9.6892	0.0566	0.1270	
CO (MOL %)	0.9058	1.5372	4.1573	9.0363	15.9788	0.0005	0.0034	
N2 (MOL %)	22.7065	22.6996	22.6827	22.6582	22.6450	39.9930	39.9853	
H2 (MOL %)	0.0567	0.1064	0.3743	1.0786	2.5324	0.0097	0.0371	
O2 (MOL %)	0.0003	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.0357	0.0553	0.1277	0.2539	0.4295	0.0691	0.1466	
OH (MOL %)	0.0078	0.0112	0.0155	0.0170	0.0157	0.0000	0.0000	
H (MOL %)	0.0002	0.0005	0.0018	0.0046	0.0094	0.0000	0.0000	
CH4 (MOL %)	0.0001	0.0002	0.0026	0.0186	0.0910	0.0000	0.0000	
NO (MOL %)	0.0165	0.0185	0.0146	0.0095	0.0057	0.0000	0.0001	
C(S) (MOL %)	38.1476	37.8005	36.3257	33.4657	29.1117	19.9567	19.8990	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	NQ	# NQ	# NQ	# NQ	#AMMONIUM PICRATE	#AMMONIUM PICRATE	#AMMONIUM PICRATE	#
RHO (G/CC)	1.500	1.400	1.200	1.000	1.720	1.720	1.500	
EO (KCAL/MOLE)	-20.29	-20.29	-20.29	-20.29	-92.98	-92.98	-92.98	
MOL.WEIGHT (G)	104.069	104.069	104.069	104.069	246.137	246.137	246.137	
C	1.0000	1.0000	1.0000	1.0000	6.0000	6.0000	6.0000	
H	4.0000	4.0000	4.0000	4.0000	6.0000	6.0000	6.0000	
N	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	
O	2.0000	2.0000	2.0000	2.0000	7.0000	7.0000	7.0000	
DETN.VEL (M/SEC)	7383.9	7012.5	6268.4	5540.3	7331.1	7331.1	6602.4	
PARTICL.VEL(")	1774.7	1692.0	1591.1	1434.6	1825.5	1825.5	1642.5	
C-J PRESS (KBAR)	196.6	166.1	119.7	79.5	230.2	230.2	162.7	
C-J VOLUME (CC/G)	0.50644	0.54195	0.62181	0.74107	0.43662	0.43662	0.50082	
C-J TEMP (DEG K)	2228.2	2321.4	2499.0	2584.5	2821.3	2821.3	2940.2	
C-J S(CAL/DEG MOL)	46.06	46.86	48.26	48.96	57.22	57.22	58.11	
C-J ENERGY (CAL/G)	376.37	342.10	302.53	245.93	398.26	398.26	322.37	
GAMMA	3.161	3.145	2.940	2.862	3.016	3.016	3.020	
C-J DETN.HEAT(CAL)	914.4	912.9	904.5	877.9	1086.1	1086.1	1072.2	
LAMDA	7.9736	7.9874	8.0242	8.0699	9.4021	9.4021	9.3635	
VOLUM(K LITTRE/KG)	0.9403	0.9409	0.9460	0.9646	0.6984	0.6984	0.7068	
TOTAL PRODCT(MOLE)	4.9872	4.9794	4.9559	4.9145	10.9985	10.9985	10.9937	
V GAS (MOLES)	3.9997	4.0024	4.0243	4.1034	7.0263	7.0263	7.1109	
V GAS (CC/MOLE)	12.2932	13.1726	15.1357	17.9265	13.3594	13.3594	15.2477	
V SOL C(S) (CC/G)	0.29804	0.31346	0.33967	0.36575	0.28511	0.28511	0.31836	
H2O (MOL %)	39.6164	39.2979	38.0310	35.2165	27.2173	27.2173	27.0332	
CO2 (MOL %)	0.2357	0.4075	0.9604	1.7780	17.9786	17.9786	17.3682	
CO (MOL %)	0.0146	0.0523	0.4033	1.9223	0.4591	0.4591	1.8902	
N2 (MOL %)	39.9745	39.9595	39.9263	39.9691	18.1706	18.1706	18.1575	
H2 (MOL %)	0.1022	0.2479	1.0045	3.0095	0.0280	0.0280	0.1562	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	
NH3 (MOL %)	0.2556	0.4116	0.8590	1.4540	0.0196	0.0196	0.0630	
OH (MOL %)	0.0001	0.0002	0.0007	0.0013	0.0035	0.0035	0.0063	
H (MOL %)	0.0000	0.0000	0.0003	0.0011	0.0001	0.0001	0.0004	
CH4 (MOL %)	0.0002	0.0010	0.0157	0.1440	0.0000	0.0000	0.0005	
NO (MOL %)	0.0001	0.0001	0.0003	0.0003	0.0078	0.0078	0.0066	
C(S) (MOL %)	19.8007	19.6219	18.7985	16.5037	36.1153	36.1153	35.3178	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	AMMONIUM PICRATE	#AMMONIUM PICRATE	#AMMONIUM PICRATE	#PICRIC ACID	#PICRIC ACID	#PICRIC ACID	#
RHO (G/CC)	1.400	1.200	1.000	1.767	1.700	1.600	1.500	
EO (KCAL/MOLE)	-92.98	-92.98	-92.98	-51.71	-51.71	-51.71	-51.71	
MOL.WEIGHT (G)	246.137	246.137	246.137	229.107	229.107	229.107	229.107	
C	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	
H	6.0000	6.0000	6.0000	3.0000	3.0000	3.0000	3.0000	
N	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	3.0000	
O	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	
DETN.VEL (M/SEC)	6274.2	5638.8	5030.4	7374.7	7175.1	6882.0	6593.3	
PARTICL.VEL(")	1594.5	1483.3	1363.1	1873.6	1832.7	1793.9	1697.0	
C-J PRESS (KBAR)	140.1	100.4	68.6	244.1	223.5	197.5	167.8	
C-J VOLUME (CC/G)	0.53276	0.61412	0.72904	0.42215	0.43799	0.46209	0.49508	
C-J TEMP (DEG K)	2988.6	3028.7	2993.1	3495.2	3533.7	3591.7	3599.3	
C-J S(CAL/DEG MOL)	58.27	57.80	56.25	62.33	62.42	62.41	61.97	
C-J ENERGY (CAL/G)	303.82	262.93	222.03	419.48	401.37	384.56	344.16	
GAMMA	2.935	2.801	2.690	2.936	2.915	2.836	2.885	
C-J DETN.HEAT(CAL)	1059.9	1017.8	949.4	1261.9	1255.0	1241.1	1220.4	
LAMDA	9.3298	9.2202	9.0653	10.7558	10.7227	10.6585	10.5641	
VOLUM(K LITTRE/KG)	0.7143	0.7404	0.7838	0.6244	0.6286	0.6369	0.6495	
TOTAL PRODCT(MOLE)	10.9898	10.9757	10.9438	9.0016	9.0010	9.0001	8.9981	
V GAS (MOLES)	7.1866	7.4490	7.8861	5.8477	5.8868	5.9641	6.0821	
V GAS (CC/MOLE)	16.1445	18.2753	21.0011	14.7142	15.1947	15.8921	16.8121	
V SOL C(S) (CC/G)	0.33079	0.35475	0.37651	0.28179	0.29137	0.30401	0.31904	
H2O (MOL %)	26.8524	26.1087	24.4697	16.5623	16.5245	16.4461	16.3179	
CO2 (MOL %)	16.8414	15.1343	12.6781	29.4981	29.0974	28.3081	27.1220	
CO (MOL %)	3.1461	7.3861	14.1261	2.1195	2.9628	4.6252	7.1503	
N2 (MOL %)	18.1473	18.1192	18.0948	16.6224	16.6211	16.6179	16.6178	
H2 (MOL %)	0.2930	0.8882	2.2359	0.0518	0.0782	0.1359	0.2389	
O2 (MOL %)	0.0001	0.0000	0.0000	0.0023	0.0021	0.0019	0.0013	
NH3 (MOL %)	0.0966	0.2014	0.3582	0.0249	0.0318	0.0442	0.0611	
OH (MOL %)	0.0078	0.0094	0.0085	0.0235	0.0271	0.0331	0.0358	
H (MOL %)	0.0007	0.0021	0.0044	0.0006	0.0009	0.0016	0.0028	
CH4 (MOL %)	0.0018	0.0142	0.0817	0.0001	0.0002	0.0005	0.0012	
NO (MOL %)	0.0062	0.0045	0.0025	0.0576	0.0554	0.0531	0.0436	
C(S) (MOL %)	34.6068	32.1318	27.9401	35.0370	34.5986	33.7326	32.4073	

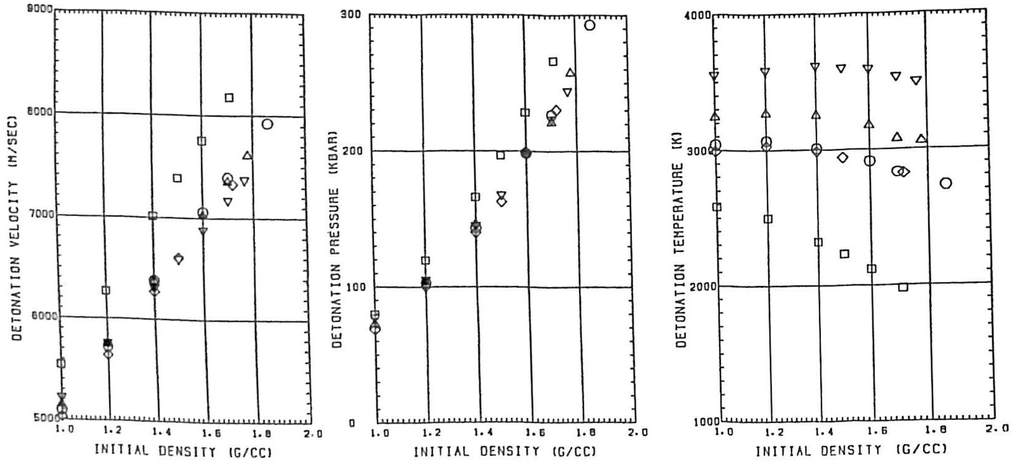
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES	PICRIC ACID	#PICRIC ACID	#PICRIC ACID	#
RHO (G/CC)	1.400	1.200	1.000	
EO (KCAL/MOLE)	-51.71	-51.71	-51.71	
MOL.WEIGHT (G)	229.107	229.107	229.107	
C	6.0000	6.0000	6.0000	
H	3.0000	3.0000	3.0000	
N	3.0000	3.0000	3.0000	
O	7.0000	7.0000	7.0000	
DETN.VEL (M/SEC)	6310.5	5763.2	5224.3	
PARTICL.VEL(")	1646.1	1523.1	1480.4	
C-J PRESS (KBAR)	145.4	105.3	77.3	
C-J VOLUME (CC/G)	0.52797	0.61311	0.71664	
C-J TEMP (DEG K)	3616.1	3586.0	3552.9	
C-J S(CAL/DEG MOL)	61.35	59.23	56.63	
C-J ENERGY (CAL/G)	323.80	277.21	261.89	
GAMMA	2.834	2.784	2.529	
C-J DETN.HEAT(CAL)	1194.8	1122.8	1031.9	
LAMDA	10.4526	10.1658	9.8546	
VOLUM(K LITTRE/KG)	0.6650	0.7090	0.7651	
TOTAL PRODCT(MOLE)	8.9960	8.9891	8.9770	
V GAS (MOLES)	6.2275	6.6395	7.1652	
V GAS (CC/MOLE)	17.6551	19.6470	21.7783	
V SOL C(S) (CC/G)	0.33125	0.35511	0.37413	
H2O (MOL %)	16.1408	15.5088	14.3581	
CO2 (MOL %)	25.6740	21.7033	16.9589	
CO (MOL %)	10.2449	18.8937	29.6504	
N2 (MOL %)	16.6149	16.6087	16.6019	
H2 (MOL %)	0.3852	0.9300	1.9348	
O2 (MOL %)	0.0010	0.0005	0.0002	
NH3 (MOL %)	0.0806	0.1326	0.1999	
OH (MOL %)	0.0388	0.0382	0.0352	
H (MOL %)	0.0044	0.0094	0.0175	
CH4 (MOL %)	0.0027	0.0127	0.0451	
NO (MOL %)	0.0378	0.0237	0.0150	
C(S) (MOL %)	30.7747	26.1384	20.1830	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

TATB RHO = 1.8600 G/CC EO = -3.340000E+04 CAL/MOLE

LN P = -3.80762577 E+00 -2.47024250 E+00LN V 3.48099589 E-01LN V*2 -3.52374688 E-02LN V*3 9.73264687 E-04LN V*4

LN T = 7.51309681 E+00 -3.89351428 E-01LN V 1.15140975 E-01LN V*2 -2.05838941 E-02LN V*3 1.22499163 E-03LN V*4

LN E = -1.67589569 E+00 4.16904628 E-01LNP 7.02946782 E-02LN P*2 5.62757999 E-03LN P*3 1.65386329 E-04LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (681.558)	0.3104	3815.6 (3503.0)	-1458.8	0.16104 (0.15393)	3.4355	296.7
500.000 (524.019)	0.3354	3397.6 (3309.1)	-1111.6	0.14651 (0.14472)	3.3620	799.4
400.000 (401.836)	0.3633	3063.4 (3127.8)	-800.0	0.13347 (0.13492)	3.2877	1330.4
300.000 (294.429)	0.3998	2754.2 (2932.2)	-493.6	0.12065 (0.12426)	3.2003	1935.2
* 292.612 (286.786)	0.4031	2731.1 (2916.5)	-469.7	0.11965 (0.12342)	3.1929	1984.2
200.000 (189.820)	0.4599	2603.5 (2684.2)	-242.4	0.11014 (0.11224)	3.0767	2723.3
100.000 (93.737)	0.5829	2359.0 (2345.2)	66.5	0.09722 (0.09757)	2.8774	3799.1
80.000 (75.304)	0.6295	2279.1 (2253.1)	143.4	0.09400 (0.09401)	2.8155	4091.9
60.000 (57.000)	0.6959	2175.3 (2143.9)	230.7	0.09035 (0.09005)	2.7367	4440.0
50.000 (47.855)	0.7423	2110.4 (2079.6)	279.7	0.08830 (0.08787)	2.6872	4645.8
40.000 (38.681)	0.8042	2032.5 (2005.5)	334.0	0.08603 (0.08548)	2.6270	4883.8
30.000 (28.719)	0.9024	1938.7 (1909.0)	393.5	0.08354 (0.08282)	2.5429	5196.0
20.000 (19.722)	1.0494	1812.4 (1798.3)	467.0	0.08046 (0.07972)	2.4369	5558.5
10.000 (10.263)	1.3867	1628.5 (1631.8)	564.6	0.07638 (0.07575)	2.2538	6117.3
8.000 (8.290)	1.5264	1577.9 (1583.7)	590.3	0.07530 (0.07475)	2.1944	6283.2
6.000 (6.274)	1.7370	1518.1 (1525.2)	620.3	0.07405 (0.07359)	2.1174	6488.8
5.000 (5.248)	1.8918	1483.1 (1490.0)	637.7	0.07332 (0.07294)	2.0683	6614.7
4.000 (4.208)	2.1083	1443.0 (1448.9)	657.6	0.07249 (0.07220)	2.0081	6764.6
3.000 (3.153)	2.4409	1395.1 (1399.0)	681.3	0.07149 (0.07133)	1.9304	6951.4
2.000 (2.087)	3.0422	1333.7 (1334.0)	711.8	0.07022 (0.07023)	1.8212	7203.4
1.000 (1.021)	4.5999	1241.4 (1237.1)	757.8	0.06829 (0.06857)	1.6402	7604.4
0.800 (0.811)	5.3077	1214.3 (1209.3)	771.3	0.06773 (0.06807)	1.5846	7726.3
0.600 (0.602)	6.4298	1180.6 (1175.3)	788.1	0.06703 (0.06742)	1.5157	7878.8
0.500 (0.499)	7.2922	1159.8 (1154.8)	798.4	0.06659 (0.06702)	1.4738	7973.0
0.400 (0.397)	8.5474	1134.8 (1130.5)	810.8	0.06608 (0.06652)	1.4247	8086.3
0.300 (0.295)	10.5702	1103.1 (1100.2)	826.4	0.06542 (0.06588)	1.3653	8229.2
0.200 (0.195)	14.4587	1058.9 (1058.6)	847.8	0.06453 (0.06495)	1.2906	8425.4
0.100 (0.097)	25.4510	983.9 (987.9)	883.2	0.06305 (0.06333)	1.1923	8747.5
0.080 (0.077)	30.7055	960.0 (964.8)	894.1	0.06259 (0.06280)	1.1695	8847.8
0.060 (0.058)	39.1959	929.3 (934.4)	907.8	0.06202 (0.06212)	1.1467	8974.6
0.050 (0.049)	45.7927	909.8 (914.9)	916.3	0.06166 (0.06170)	1.1361	9053.6
0.040 (0.039)	55.4304	886.1 (890.7)	926.4	0.06124 (0.06118)	1.1271	9149.1
0.030 (0.030)	70.9363	855.6 (859.1)	939.0	0.06071 (0.06053)	1.1219	9270.4
0.020 (0.020)	100.4129	812.9 (814.0)	955.9	0.06000 (0.05966)	1.1259	9438.1
0.010 (0.010)	181.4249	740.5 (737.4)	982.6	0.05889 (0.05840)	1.1611	9717.0
0.008 (0.008)	219.2729	717.4 (713.5)	990.7	0.05855 (0.05808)	1.1793	9804.9
0.006 (0.006)	279.7107	688.0 (683.7)	1000.6	0.05814 (0.05774)	1.2071	9916.6
0.005 (0.005)	326.0315	669.2 (665.5)	1006.7	0.05788 (0.05758)	1.2271	9986.3
0.004 (0.004)	393.3723	646.8 (644.1)	1013.8	0.05758 (0.05745)	1.2540	10070.7
0.003 (0.003)	500.6870	618.4 (618.2)	1022.6	0.05721 (0.05740)	1.2922	10177.7
0.002 (0.002)	702.2805	579.3 (585.5)	1034.3	0.05673 (0.05759)	1.3523	10324.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

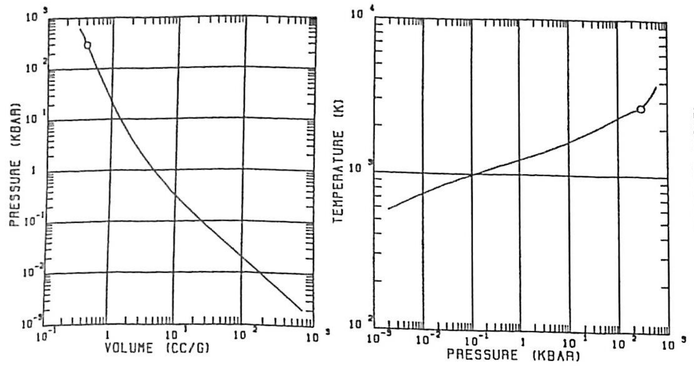
TATB RHO = 1.8600 G/CC EO = -3.340000E+04 CAL/MOLE

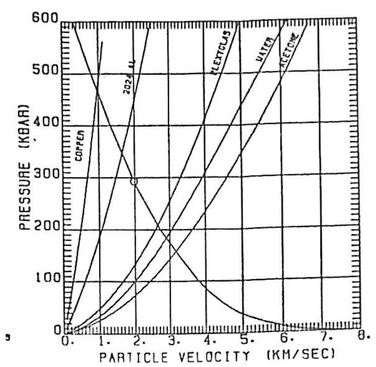
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

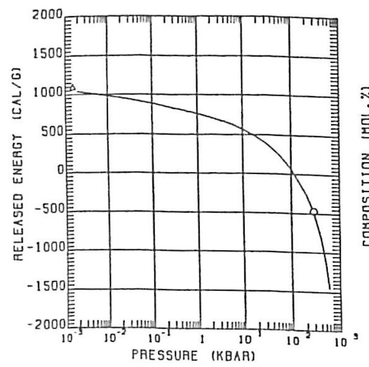
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
292.612	2.99738	1.49374	0.01380	2.99891	0.00086	0.00002	0.00110	0.00023	0.00000	0.00000	0.00108	4.49246
200.000	2.99223	1.48370	0.03989	2.99846	0.00356	0.00000	0.00275	0.00016	0.00000	0.00000	0.00033	4.47641
100.000	2.95927	1.43775	0.16515	2.99496	0.02527	0.00000	0.01004	0.00005	0.00001	0.00019	0.00003	4.39692
80.000	2.93744	1.41649	0.22953	2.99311	0.04081	0.00000	0.01377	0.00004	0.00001	0.00054	0.00002	4.35344
60.000	2.89846	1.38884	0.32383	2.99033	0.06891	0.00000	0.01933	0.00002	0.00001	0.00181	0.00001	4.28552
50.000	2.86669	1.37313	0.38705	2.98843	0.09151	0.00000	0.02313	0.00001	0.00001	0.00355	0.00000	4.23628
40.000	2.81992	1.35807	0.46394	2.98612	0.12356	0.00000	0.02777	0.00001	0.00001	0.00743	0.00000	4.17056
30.000	2.74734	1.34763	0.55742	2.98348	0.16995	0.00000	0.03305	0.00000	0.00000	0.01657	0.00000	4.07838
20.000	2.61531	1.35611	0.67249	2.98050	0.23912	0.00000	0.03901	0.00000	0.00000	0.04353	0.00000	3.92787
10.000	2.33812	1.43214	0.79764	2.97949	0.33501	0.00000	0.04103	0.00000	0.00000	0.13266	0.00000	3.63757
8.000	2.24577	1.46792	0.81842	2.98011	0.35595	0.00000	0.03978	0.00000	0.00000	0.16930	0.00000	3.54437
6.000	2.13164	1.51770	0.83301	2.98132	0.37637	0.00000	0.03737	0.00000	0.00000	0.21797	0.00000	3.43134
5.000	2.06448	1.55006	0.83545	2.98222	0.38593	0.00000	0.03556	0.00000	0.00000	0.24813	0.00000	3.36638
4.000	1.98920	1.58957	0.83170	2.98341	0.39471	0.00000	0.03319	0.00000	0.00000	0.28315	0.00000	3.29558
3.000	1.90447	1.63931	0.81696	2.98495	0.40229	0.00000	0.03010	0.00000	0.00000	0.32404	0.00000	3.21970
2.000	1.80860	1.70549	0.78047	2.98702	0.40779	0.00000	0.02596	0.00000	0.00000	0.37233	0.00000	3.14171
1.000	1.70068	1.80620	0.68698	2.99003	0.40795	0.00000	0.01995	0.00000	0.00000	0.43072	0.00000	3.07608
0.800	1.67824	1.83504	0.65175	2.99085	0.40642	0.00000	0.01831	0.00000	0.00000	0.44393	0.00000	3.06927
0.600	1.65737	1.86985	0.60300	2.99181	0.40324	0.00000	0.01639	0.00000	0.00000	0.45741	0.00000	3.06973
0.500	1.64854	1.89055	0.57043	2.99237	0.40051	0.00000	0.01527	0.00000	0.00000	0.46403	0.00000	3.07497
0.400	1.64203	1.91422	0.52960	2.99301	0.39655	0.00000	0.01399	0.00000	0.00000	0.47022	0.00000	3.08594
0.300	1.64038	1.94211	0.47547	2.99377	0.39022	0.00000	0.01248	0.00000	0.00000	0.47535	0.00000	3.10704
0.200	1.64993	1.97614	0.39787	2.99472	0.37855	0.00000	0.01057	0.00000	0.00000	0.47783	0.00000	3.14815
0.100	1.69269	2.01865	0.27011	2.99608	0.34965	0.00000	0.00786	0.00000	0.00000	0.47294	0.00000	3.23828
0.080	1.71174	2.02768	0.23300	2.99645	0.33798	0.00000	0.00712	0.00000	0.00000	0.46981	0.00000	3.26950
0.060	1.73956	2.03598	0.18859	2.99688	0.32075	0.00000	0.00625	0.00000	0.00000	0.46516	0.00000	3.31026
0.050	1.75881	2.03923	0.16283	2.99714	0.30863	0.00000	0.00574	0.00000	0.00000	0.46198	0.00000	3.33594
0.040	1.78392	2.04098	0.13424	2.99743	0.29272	0.00000	0.00517	0.00000	0.00000	0.45781	0.00000	3.36697
0.030	1.81857	2.03971	0.10213	2.99776	0.27047	0.00000	0.00450	0.00000	0.00000	0.45211	0.00000	3.40604
0.020	1.87179	2.03122	0.06591	2.99818	0.23627	0.00000	0.00367	0.00000	0.00000	0.44323	0.00000	3.45964
0.010	1.97366	2.00001	0.02647	2.99875	0.17372	0.00000	0.00253	0.00000	0.00000	0.42443	0.00000	3.54909
0.008	2.00926	1.98606	0.01878	2.99890	0.15366	0.00000	0.00222	0.00000	0.00000	0.41688	0.00000	3.57828
0.006	2.05708	1.96575	0.01159	2.99908	0.12865	0.00000	0.00187	0.00000	0.00000	0.40575	0.00000	3.61690
0.005	2.08920	1.95136	0.00825	2.99919	0.11309	0.00000	0.00166	0.00000	0.00000	0.39762	0.00000	3.64276
0.004	2.12859	1.93311	0.00536	2.99930	0.09582	0.00000	0.00143	0.00000	0.00000	0.38673	0.00000	3.67479
0.003	2.18107	1.90809	0.00293	2.99943	0.07562	0.00000	0.00118	0.00000	0.00000	0.37078	0.00000	3.71819
0.002	2.25808	1.87049	0.00114	2.99959	0.05163	0.00000	0.00087	0.00000	0.00000	0.34450	0.00000	3.78384
300.000	2.99747	1.49385	0.01331	2.99885	0.00081	0.00002	0.00106	0.00025	0.00000	0.00000	0.00123	4.49285
400.000	2.99790	1.49284	0.01012	2.99690	0.00047	0.00016	0.00086	0.00066	0.00000	0.00000	0.00533	4.49705
500.000	2.99742	1.48670	0.01012	2.99142	0.00040	0.00068	0.00096	0.00150	0.00000	0.00000	0.01619	4.50318
600.000	2.99523	1.47300	0.01528	2.98073	0.00055	0.00172	0.00173	0.00325	0.00001	0.00000	0.03681	4.51173

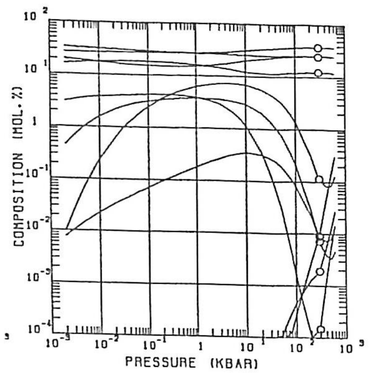
PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT









TATB

RHO (G/CC)	1.860
E_0 (KCAL/MOLE)	-33.40
D_{C-J}(M/SEC)	7928.
P_{C-J}(KBAR)	292.6
T_{C-J}(K)	2731.

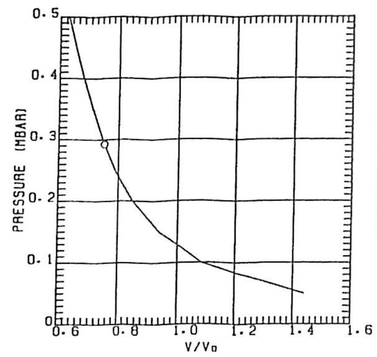
DATE 82-10-21

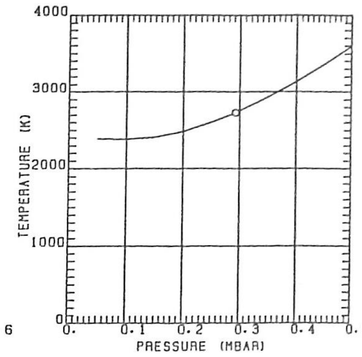
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

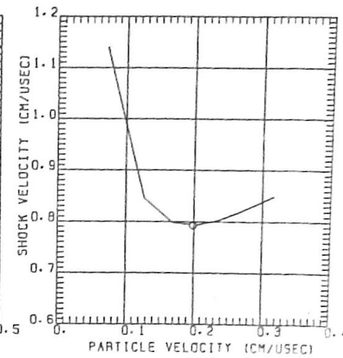
TATB RHO = 1.8600 G/CC, EO = -3.340000E+04 CAL/MOLE

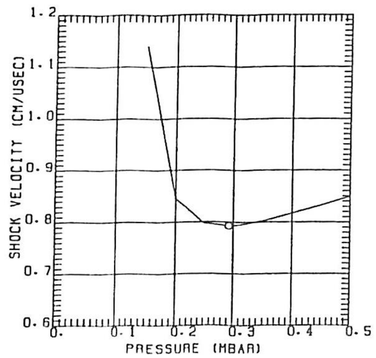
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3374	0.3501	0.3642	0.3804	0.3998	0.4242	0.4568	0.5042	0.5841	0.7727
TEMP (DEG K)	3597.2	3356.6	3134.2	2932.6	2755.2	2603.8	2484.6	2408.0	2383.9	2385.4
US (M/SEC)	8494.7	8328.1	8164.1	8020.7	7932.9	7983.1	8456.1	11390.1	0.0	0.0
UP (M/SEC)	3164.5	2905.1	2634.1	2346.1	2033.2	1683.7	1271.6	708.0	0.0	0.0
H2O (MOLE)	2.9958	2.9968	2.9974	2.9977	2.9975	2.9967	2.9945	2.9874	2.9566	2.7450
CO2 (MOLE)	1.4798	1.4870	1.4913	1.4934	1.4938	1.4928	1.4890	1.4773	1.4330	1.2315
CO (MOLE)	0.0165	0.0139	0.0124	0.0121	0.0133	0.0171	0.0272	0.0578	0.1774	0.7919
N2 (MOLE)	2.9876	2.9931	2.9963	2.9981	2.9988	2.9991	2.9989	2.9980	2.9947	2.9813
H2 (MOLE)	0.0007	0.0006	0.0006	0.0006	0.0008	0.0012	0.0024	0.0066	0.0271	0.1814
O2 (MOLE)	0.0011	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0015	0.0012	0.0010	0.0010	0.0011	0.0013	0.0020	0.0040	0.0106	0.0374
OH (MOLE)	0.0026	0.0015	0.0008	0.0005	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0087
NO (MOLE)	0.0234	0.0127	0.0063	0.0029	0.0012	0.0005	0.0002	0.0001	0.0000	0.0000
C(S) (MOLE)	4.5037	4.4991	4.4963	4.4945	4.4928	4.4901	4.4838	4.4649	4.3895	3.9679

K-H-T HUGONIOT









TATB
RHO (G/CC) 1.860
E_0 (KCAL/MOLE) -33.40

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

DATB RHO = 1.7800 G/CC EO = -2.360000E+04 CAL/MOLE

LN P = -3.76634789 E+00 -2.43993759 E+00LN V 3.39346588 E-01LN V*2 -3.40787992 E-02LN V*3 9.83015168 E-04LN V*4

LN T = 7.60760689 E+00 -4.18914080 E-01LN V 1.29335880 E-01LN V*2 -2.24010907 E-02LN V*3 1.34056527 E-03LN V*4

LN E = -1.63320732 E+00 4.37487900 E-01LNP 7.37624168 E-02LN P*2 5.90873882 E-03LN P*3 1.73228298 E-04LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (679.756)	0.3099	4370.8 (4081.8)	-1575.5	0.16592 (0.15910)	3.3815	0.0
500.000 (524.654)	0.3349	3924.1 (3835.0)	-1216.2	0.15089 (0.14913)	3.3099	448.5
400.000 (401.952)	0.3633	3552.0 (3601.3)	-889.4	0.13721 (0.13854)	3.2361	987.0
300.000 (293.980)	0.4007	3204.1 (3350.9)	-570.6	0.12387 (0.12708)	3.1492	1600.4
* 257.361 (250.612)	0.4217	3054.2 (3232.4)	-430.7	0.11802 (0.12181)	3.1048	1899.3
200.000 (190.934)	0.4608	2950.2 (3043.5)	-281.8	0.11179 (0.11421)	3.0290	2381.6
100.000 (94.067)	0.5867	2636.9 (2620.8)	41.5	0.09826 (0.09859)	2.8315	3474.5
80.000 (75.512)	0.6346	2534.1 (2507.4)	123.0	0.09485 (0.09482)	2.7701	3772.2
60.000 (57.067)	0.7032	2402.4 (2373.6)	215.9	0.09097 (0.09063)	2.6918	4127.2
50.000 (47.864)	0.7511	2321.6 (2295.3)	268.0	0.08879 (0.08832)	2.6427	4337.0
40.000 (38.645)	0.8152	2226.3 (2205.7)	325.6	0.08638 (0.08581)	2.5829	4579.9
30.000 (28.762)	0.9157	2112.4 (2091.3)	389.5	0.08370 (0.08300)	2.5005	4894.3
20.000 (19.717)	1.0684	1964.6 (1959.5)	466.9	0.08046 (0.07974)	2.3955	5264.7
10.000 (10.248)	1.4194	1756.9 (1764.9)	568.8	0.07620 (0.07557)	2.2146	5835.0
8.000 (8.278)	1.5650	1700.6 (1709.5)	595.7	0.07508 (0.07451)	2.1561	6004.3
6.000 (6.266)	1.7849	1634.5 (1642.7)	627.1	0.07376 (0.07329)	2.0803	6214.1
5.000 (5.242)	1.9469	1596.1 (1602.9)	645.3	0.07300 (0.07260)	2.0320	6342.8
4.000 (4.203)	2.1738	1552.2 (1556.7)	666.3	0.07212 (0.07182)	1.9727	6496.1
3.000 (3.150)	2.5236	1500.1 (1501.0)	691.3	0.07108 (0.07090)	1.8962	6687.6
2.000 (2.085)	3.1568	1433.8 (1429.8)	723.5	0.06973 (0.06974)	1.7889	6946.0
1.000 (1.022)	4.8055	1335.7 (1326.4)	772.2	0.06769 (0.06797)	1.6113	7358.1
0.800 (0.812)	5.5583	1307.3 (1297.4)	786.6	0.06709 (0.06743)	1.5567	7483.7
0.600 (0.603)	6.7556	1272.2 (1262.7)	804.5	0.06634 (0.06674)	1.4891	7641.2
0.500 (0.500)	7.6793	1250.7 (1242.0)	815.6	0.06588 (0.06630)	1.4479	7738.9
0.400 (0.397)	9.0281	1225.0 (1217.8)	828.9	0.06532 (0.06577)	1.3997	7856.4
0.300 (0.295)	11.2104	1192.7 (1188.1)	845.7	0.06462 (0.06508)	1.3413	8005.0
0.200 (0.195)	15.4272	1148.3 (1148.2)	868.9	0.06364 (0.06408)	1.2678	8209.4
0.100 (0.097)	27.4342	1074.9 (1081.8)	907.4	0.06203 (0.06233)	1.1707	8545.8
0.080 (0.077)	33.2095	1052.1 (1060.2)	919.3	0.06154 (0.06176)	1.1480	8650.9
0.060 (0.058)	42.5789	1023.1 (1031.8)	934.3	0.06091 (0.06102)	1.1251	8784.1
0.050 (0.049)	49.8842	1004.8 (1013.6)	943.7	0.06052 (0.06055)	1.1142	8867.2
0.040 (0.039)	60.6093	982.9 (990.9)	954.8	0.06005 (0.05999)	1.1047	8968.0
0.030 (0.030)	77.9608	955.0 (961.0)	968.8	0.05946 (0.05928)	1.0985	9096.2
0.020 (0.020)	111.2304	916.2 (918.4)	987.9	0.05867 (0.05832)	1.1005	9274.4
0.010 (0.010)	204.0644	850.9 (846.1)	1018.4	0.05739 (0.05691)	1.1307	9573.0
0.008 (0.008)	248.0236	830.2 (823.7)	1027.5	0.05701 (0.05654)	1.1468	9667.8
0.006 (0.006)	318.7039	803.5 (796.2)	1039.1	0.05653 (0.05613)	1.1717	9788.6
0.005 (0.005)	373.4270	786.5 (779.7)	1046.1	0.05623 (0.05593)	1.1896	9864.4
0.004 (0.004)	453.1819	765.9 (760.7)	1054.5	0.05588 (0.05575)	1.2137	9956.2
0.003 (0.003)	581.1692	739.2 (738.7)	1065.0	0.05544 (0.05562)	1.2480	10072.8
0.002 (0.002)	823.7634	701.8 (713.0)	1079.0	0.05486 (0.05572)	1.3017	10232.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

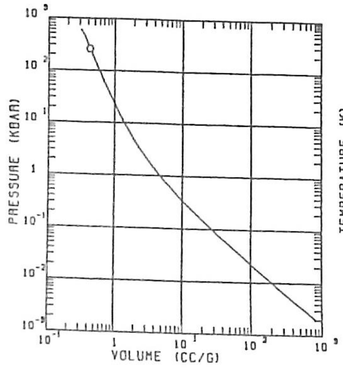
DATB RHO = 1.7800 G/CC EO = -2.360000E+04 CAL/MOLE

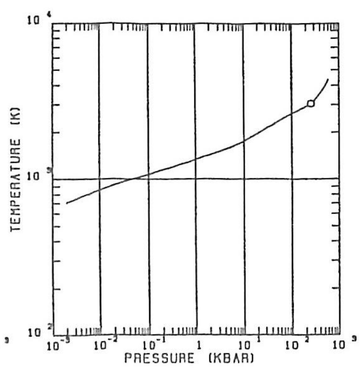
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

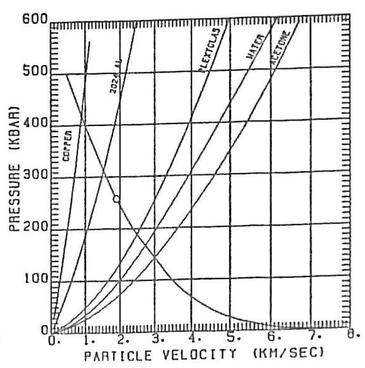
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
257.361	2.49277	1.72365	0.05689	2.49766	0.00311	0.00005	0.00249	0.00075	0.00001	0.00000	0.00219	4.21946
200.000	2.48661	1.70397	0.10378	2.49743	0.00696	0.00002	0.00407	0.00058	0.00002	0.00001	0.00106	4.19224
100.000	2.44327	1.60369	0.34904	2.49411	0.03837	0.00000	0.01166	0.00020	0.00003	0.00038	0.00012	4.04690
80.000	2.41763	1.56232	0.45754	2.49248	0.05797	0.00000	0.01497	0.00013	0.00003	0.00093	0.00006	3.97921
60.000	2.37397	1.50952	0.60692	2.49019	0.09136	0.00000	0.01960	0.00007	0.00003	0.00261	0.00002	3.88096
50.000	2.33982	1.47905	0.70202	2.48871	0.11694	0.00000	0.02257	0.00004	0.00003	0.00468	0.00001	3.81425
40.000	2.29117	1.44747	0.81386	2.48699	0.15203	0.00000	0.02601	0.00003	0.00002	0.00888	0.00001	3.72978
30.000	2.21989	1.41935	0.94141	2.48522	0.20029	0.00000	0.02955	0.00001	0.00002	0.01774	0.00000	3.62151
20.000	2.09586	1.40274	1.09868	2.48336	0.27106	0.00000	0.03329	0.00000	0.00001	0.04158	0.00000	3.45704
10.000	1.85618	1.43644	1.27097	2.48323	0.36880	0.00000	0.03354	0.00000	0.00000	0.11236	0.00000	3.18028
8.000	1.78077	1.45928	1.30070	2.48385	0.39082	0.00000	0.03231	0.00000	0.00000	0.13998	0.00000	3.10008
6.000	1.68991	1.49357	1.32298	2.48490	0.41300	0.00000	0.03020	0.00000	0.00000	0.17590	0.00000	3.00758
5.000	1.63727	1.51710	1.32857	2.48566	0.42397	0.00000	0.02868	0.00000	0.00000	0.19787	0.00000	2.95651
4.000	1.57896	1.54706	1.32697	2.48663	0.43470	0.00000	0.02675	0.00000	0.00000	0.22311	0.00000	2.90291
3.000	1.51382	1.58662	1.31299	2.48787	0.44519	0.00000	0.02426	0.00000	0.00000	0.25230	0.00000	2.84811
2.000	1.44091	1.64285	1.27344	2.48952	0.45515	0.00000	0.02096	0.00000	0.00000	0.28625	0.00000	2.79749
1.000	1.35905	1.73711	1.16678	2.49191	0.46437	0.00000	0.01618	0.00000	0.00000	0.32616	0.00000	2.76996
0.800	1.34207	1.76630	1.12538	2.49257	0.46617	0.00000	0.01487	0.00000	0.00000	0.33473	0.00000	2.77361
0.600	1.32633	1.80339	1.06694	2.49334	0.46762	0.00000	0.01334	0.00000	0.00000	0.34303	0.00000	2.78665
0.500	1.31978	1.82654	1.02721	2.49379	0.46805	0.00000	0.01244	0.00000	0.00000	0.34676	0.00000	2.79951
0.400	1.31489	1.85427	0.97662	2.49430	0.46830	0.00000	0.01141	0.00000	0.00000	0.34985	0.00000	2.81927
0.300	1.31368	1.88914	0.90811	2.49491	0.46793	0.00000	0.01019	0.00000	0.00000	0.35155	0.00000	2.85120
0.200	1.32048	1.93637	0.80685	2.49567	0.46581	0.00000	0.00866	0.00000	0.00000	0.35036	0.00000	2.90642
0.100	1.35027	2.01048	0.62885	2.49676	0.45660	0.00000	0.00650	0.00000	0.00000	0.34169	0.00000	3.01900
0.080	1.36299	2.03166	0.57376	2.49705	0.45229	0.00000	0.00591	0.00000	0.00000	0.33793	0.00000	3.05663
0.060	1.38150	2.05718	0.50423	2.49740	0.44502	0.00000	0.00522	0.00000	0.00000	0.33283	0.00000	3.10576
0.050	1.39431	2.07227	0.46124	2.49759	0.43928	0.00000	0.00483	0.00000	0.00000	0.32959	0.00000	3.13689
0.040	1.41060	2.08905	0.41139	2.49782	0.43160	0.00000	0.00438	0.00000	0.00000	0.32562	0.00000	3.17390
0.030	1.43314	2.10819	0.35059	2.49808	0.41982	0.00000	0.00386	0.00000	0.00000	0.32063	0.00000	3.22058
0.020	1.46765	2.12999	0.27248	2.49840	0.39946	0.00000	0.00322	0.00000	0.00000	0.31403	0.00000	3.28348
0.010	1.53500	2.15148	0.16216	2.49884	0.35365	0.00000	0.00235	0.00000	0.00000	0.30392	0.00000	3.38240
0.008	1.55875	2.15379	0.13379	2.49895	0.33641	0.00000	0.00212	0.00000	0.00000	0.30084	0.00000	3.41156
0.006	1.59145	2.15343	0.10182	2.49909	0.31190	0.00000	0.00184	0.00000	0.00000	0.29695	0.00000	3.44777
0.005	1.61337	2.15122	0.08431	2.49917	0.29522	0.00000	0.00169	0.00000	0.00000	0.29445	0.00000	3.46999
0.004	1.64128	2.14650	0.06586	2.49926	0.27398	0.00000	0.00151	0.00000	0.00000	0.29125	0.00000	3.49637
0.003	1.67917	2.13725	0.04648	2.49936	0.24537	0.00000	0.00130	0.00000	0.00000	0.28676	0.00000	3.52950
0.002	1.73608	2.11869	0.02669	2.49949	0.20378	0.00000	0.00104	0.00000	0.00000	0.27930	0.00000	3.57532
300.000	2.49398	1.72698	0.04646	2.49681	0.00225	0.00012	0.00213	0.00112	0.00001	0.00000	0.00425	4.22657
400.000	2.49466	1.72607	0.03494	2.49184	0.00137	0.00064	0.00182	0.00247	0.00002	0.00000	0.01451	4.23899
500.000	2.49350	1.71380	0.03293	2.48060	0.00112	0.00218	0.00198	0.00479	0.00003	0.00000	0.03681	4.25327
600.000	2.48949	1.68859	0.04291	2.46232	0.00136	0.00471	0.00316	0.00878	0.00005	0.00000	0.07221	4.26850

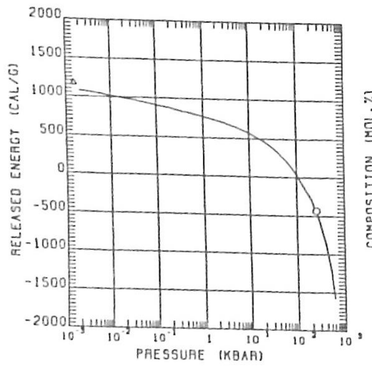
PRESS ;KBAR, PRODUCTS ;MOLES

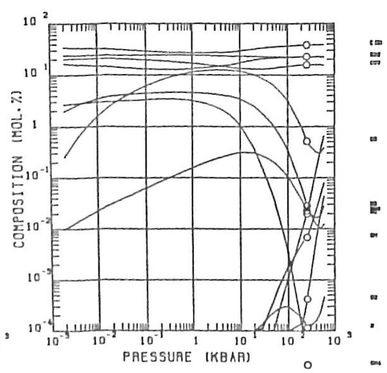
K-H-T ISENTROPE THRU C-J POINT











DATB
RHO (G/CC) 1.780
E_0 (KCAL/MOLE) -23.60
D_{C-J}(M/SEC) 7613.
P_{C-J}(KBAR) 257.4
T_{C-J}(K) 3054.

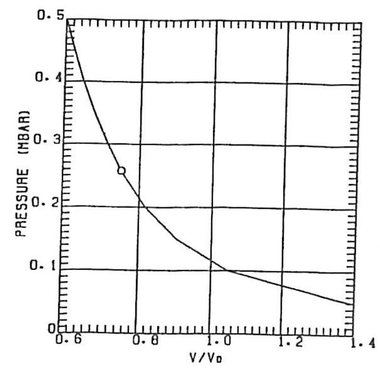
DATE 82-10-21

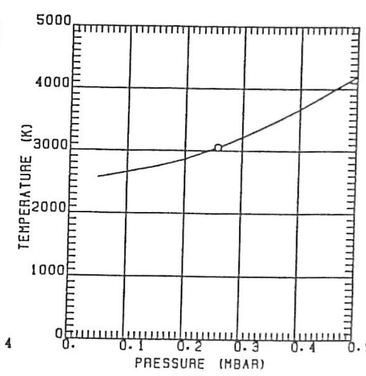
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

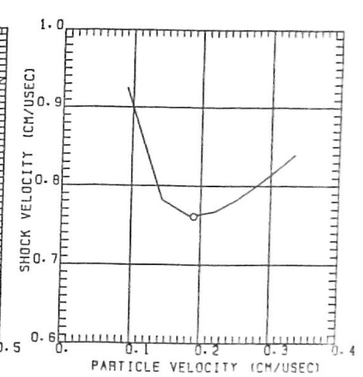
DATB RHO = 1.7800 G/CC, EO = -2.360000E+04 CAL/MOLE

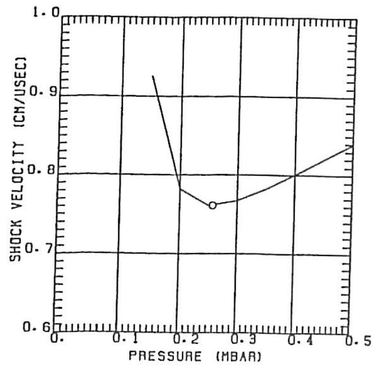
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3379	0.3506	0.3648	0.3813	0.4010	0.4256	0.4586	0.5065	0.5879	0.7826
TEMP (DEG K)	4201.2	3927.4	3672.1	3434.9	3218.8	3027.3	2866.8	2743.2	2659.2	2573.0
US (M/SEC)	8394.8	8200.6	8006.2	7822.4	7672.6	7612.5	7820.1	9252.6	0.0	0.0
UP (M/SEC)	3346.1	3082.8	2806.8	2513.7	2196.6	1845.0	1436.8	910.8	0.0	0.0
H2O (MOLE)	2.4892	2.4917	2.4932	2.4939	2.4938	2.4925	2.4890	2.4786	2.4406	2.2290
CO2 (MOLE)	1.6940	1.7096	1.7196	1.7249	1.7261	1.7230	1.7126	1.6842	1.5964	1.2907
CO (MOLE)	0.0539	0.0476	0.0446	0.0444	0.0482	0.0587	0.0846	0.1523	0.3663	1.1894
N2 (MOLE)	2.4716	2.4825	2.4898	2.4943	2.4967	2.4978	2.4979	2.4970	2.4939	2.4834
H2 (MOLE)	0.0020	0.0018	0.0018	0.0019	0.0023	0.0033	0.0056	0.0126	0.0403	0.2020
O2 (MOLE)	0.0035	0.0018	0.0008	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0031	0.0025	0.0022	0.0021	0.0022	0.0025	0.0035	0.0057	0.0121	0.0332
OH (MOLE)	0.0083	0.0054	0.0033	0.0020	0.0012	0.0007	0.0004	0.0003	0.0002	0.0002
H (MOLE)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0095
NO (MOLE)	0.0537	0.0325	0.0181	0.0093	0.0044	0.0019	0.0008	0.0003	0.0001	0.0000
C(S) (MOLE)	4.2522	4.2428	4.2359	4.2307	4.2257	4.2183	4.2028	4.1634	4.0369	3.5104

K-H-T HUGONIOT









DATB
RHO (G/CC) 1.780
E_0 (KCAL/MOLE) -23.60

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

NQ RHO = 1.7100 G/CC EO = -2.029000E+04 CAL/MOLE

LN P = -3.66465473 E+00 -2.64190102 E+00LN V 3.31414282 E-01LN V*2 -2.63008587 E-02LN V*3 -1.50478285 E-04LN V*4

LN T = 7.19669437 E+00 -4.60771739 E-01LN V 1.17936015 E-01LN V*2 -3.13170552 E-02LN V*3 2.83961929 E-03LN V*4

LN E = -1.63952637 E+00 4.51296329 E-01LNP 7.79475570 E-02LN P*2 6.36194274 E-03LN P*3 1.94541208 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (622.221)	0.3478	2844.7 (2579.1)	-1477.6	0.16182 (0.15715)	3.4291	65.9
500.000 (502.609)	0.3704	2533.2 (2450.8)	-1150.8	0.14815 (0.14705)	3.3775	547.5
400.000 (398.834)	0.3968	2285.4 (2321.8)	-846.3	0.13541 (0.13637)	3.3214	1067.9
300.000 (299.859)	0.4328	2056.5 (2175.6)	-540.7	0.12262 (0.12486)	3.2520	1669.3
* 266.121 (266.614)	0.4488	1977.2 (2119.2)	-432.7	0.11810 (0.12069)	3.2233	1902.2
200.000 (198.554)	0.4923	1893.3 (1986.9)	-246.5	0.11031 (0.11201)	3.1510	2445.3
100.000 (97.954)	0.6200	1692.4 (1715.5)	90.4	0.09622 (0.09656)	2.9767	3567.2
80.000 (78.325)	0.6689	1634.5 (1641.2)	170.8	0.09285 (0.09285)	2.9212	3876.5
60.000 (58.861)	0.7385	1560.8 (1553.3)	261.4	0.08906 (0.08877)	2.8501	4244.0
50.000 (49.178)	0.7870	1515.4 (1501.6)	311.8	0.08695 (0.08652)	2.8052	4460.5
40.000 (39.525)	0.8514	1461.3 (1442.3)	366.8	0.08465 (0.08409)	2.7506	4709.6
30.000 (29.410)	0.9493	1393.7 (1367.8)	428.3	0.08208 (0.08139)	2.6766	5023.8
20.000 (19.915)	1.1012	1301.5 (1278.4)	502.3	0.07898 (0.07828)	2.5787	5402.2
10.000 (10.148)	1.4431	1157.4 (1143.7)	600.3	0.07488 (0.07438)	2.4094	5974.0
8.000 (8.147)	1.5825	1115.2 (1104.5)	625.9	0.07381 (0.07341)	2.3543	6140.8
6.000 (6.130)	1.7891	1064.1 (1056.5)	655.2	0.07258 (0.07231)	2.2831	6344.5
5.000 (5.115)	1.9383	1033.6 (1027.5)	672.0	0.07188 (0.07169)	2.2380	6467.5
4.000 (4.092)	2.1441	997.7 (993.2)	690.9	0.07109 (0.07100)	2.1825	6612.4
3.000 (3.066)	2.4529	953.8 (950.9)	713.0	0.07017 (0.07020)	2.1111	6790.0
2.000 (2.034)	2.9937	895.4 (894.3)	740.3	0.06902 (0.06922)	2.0108	7025.2
1.000 (1.002)	4.3243	801.9 (804.0)	779.5	0.06738 (0.06777)	1.8424	7390.6
0.800 (0.797)	4.9048	773.6 (776.2)	790.4	0.06693 (0.06735)	1.7898	7499.4
0.600 (0.594)	5.7967	737.7 (741.2)	803.6	0.06638 (0.06681)	1.7240	7633.6
0.500 (0.494)	6.4621	715.4 (719.5)	811.5	0.06605 (0.06648)	1.6837	7715.2
0.400 (0.394)	7.4039	688.7 (693.1)	820.6	0.06567 (0.06608)	1.6360	7812.0
0.300 (0.295)	8.8661	654.9 (659.7)	831.7	0.06520 (0.06556)	1.5775	7932.1
0.200 (0.197)	11.5353	608.5 (613.2)	846.3	0.06459 (0.06484)	1.5017	8093.1
0.100 (0.099)	18.5222	531.5 (535.8)	869.0	0.06364 (0.06364)	1.3944	8350.1
0.080 (0.079)	21.7666	509.4 (511.2)	875.3	0.06338 (0.06327)	1.3664	8430.2
0.060 (0.060)	26.8348	480.2 (480.5)	883.4	0.06304 (0.06281)	1.3367	8529.5
0.050 (0.050)	30.7032	462.3 (461.6)	888.4	0.06283 (0.06253)	1.3215	8591.0
0.040 (0.040)	36.2711	441.0 (439.2)	894.3	0.06258 (0.06222)	1.3070	8664.9
0.030 (0.030)	45.0679	414.7 (411.6)	901.5	0.06228 (0.06186)	1.2952	8758.0
0.020 (0.020)	61.3924	379.8 (375.8)	911.0	0.06188 (0.06145)	1.2924	8885.0
0.010 (0.010)	104.8430	326.6 (324.5)	925.7	0.06127 (0.06117)	1.3266	9092.6
0.008 (0.008)	124.8745	311.5 (311.0)	929.8	0.06110 (0.06123)	1.3486	9157.5
0.006 (0.006)	156.2172	292.6 (296.1)	935.0	0.06088 (0.06144)	1.3846	9238.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

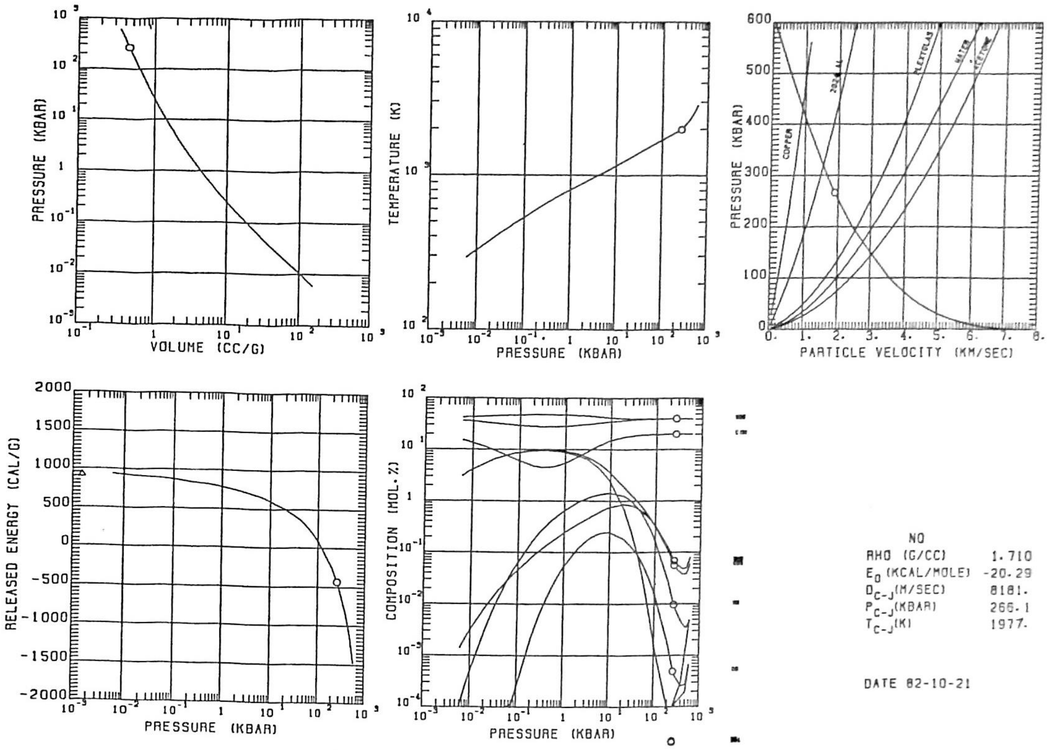
NQ RHO = 1.7100 G/CC EO = -2.029000E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
266.121	1.99435	0.00282	0.00002	1.99827	0.00048	0.00000	0.00345	0.00000	0.00000	0.00000	0.00000	0.99715
200.000	1.98976	0.00509	0.00008	1.99703	0.00132	0.00000	0.00594	0.00000	0.00000	0.00000	0.00000	0.99483
100.000	1.96730	0.01598	0.00076	1.99191	0.00829	0.00000	0.01617	0.00000	0.00000	0.00008	0.00000	0.98318
80.000	1.95541	0.02165	0.00132	1.98965	0.01304	0.00000	0.02071	0.00000	0.00000	0.00025	0.00000	0.97677
60.000	1.93619	0.03073	0.00240	1.98650	0.02136	0.00000	0.02701	0.00000	0.00000	0.00097	0.00000	0.96590
50.000	1.92154	0.03761	0.00329	1.98451	0.02780	0.00000	0.03098	0.00000	0.00000	0.00209	0.00000	0.95701
40.000	1.90079	0.04735	0.00456	1.98231	0.03646	0.00000	0.03539	0.00000	0.00000	0.00483	0.00000	0.94326
30.000	1.86884	0.06244	0.00635	1.98022	0.04775	0.00000	0.03956	0.00000	0.00000	0.01203	0.00000	0.91918
20.000	1.80730	0.09193	0.00893	1.97906	0.06080	0.00000	0.04189	0.00000	0.00000	0.03453	0.00000	0.86461
10.000	1.65792	0.16545	0.01129	1.98202	0.06730	0.00000	0.03598	0.00000	0.00000	0.11041	0.00000	0.71285
8.000	1.60144	0.19375	0.01123	1.98361	0.06565	0.00000	0.03279	0.00000	0.00000	0.14187	0.00000	0.65316
6.000	1.52760	0.23097	0.01059	1.98572	0.06191	0.00000	0.02858	0.00000	0.00000	0.18382	0.00000	0.57463
5.000	1.48199	0.25414	0.00993	1.98701	0.05890	0.00000	0.02600	0.00000	0.00000	0.21006	0.00000	0.52591
4.000	1.42868	0.28127	0.00892	1.98849	0.05480	0.00000	0.02303	0.00000	0.00000	0.24099	0.00000	0.46883
3.000	1.36660	0.31306	0.00742	1.99022	0.04913	0.00000	0.01957	0.00000	0.00000	0.27746	0.00000	0.40208
2.000	1.29426	0.35031	0.00526	1.99229	0.04092	0.00000	0.01544	0.00000	0.00000	0.32084	0.00000	0.32361
1.000	1.21385	0.39200	0.00229	1.99495	0.02755	0.00000	0.01013	0.00000	0.00000	0.37171	0.00000	0.23402
0.800	1.19816	0.40018	0.00165	1.99560	0.02377	0.00000	0.00882	0.00000	0.00000	0.38243	0.00000	0.21576
0.600	1.18494	0.40710	0.00102	1.99634	0.01923	0.00000	0.00734	0.00000	0.00000	0.39242	0.00000	0.19948
0.500	1.18030	0.40961	0.00073	1.99676	0.01660	0.00000	0.00652	0.00000	0.00000	0.39667	0.00000	0.19301
0.400	1.17807	0.41081	0.00047	1.99721	0.01371	0.00000	0.00562	0.00000	0.00000	0.39991	0.00000	0.18883
0.300	1.18109	0.40944	0.00025	1.99771	0.01046	0.00000	0.00461	0.00000	0.00000	0.40078	0.00000	0.18954
0.200	1.19646	0.40182	0.00009	1.99830	0.00678	0.00000	0.00343	0.00000	0.00000	0.39582	0.00000	0.20227
0.100	1.25317	0.37354	0.00001	1.99905	0.00271	0.00000	0.00195	0.00000	0.00000	0.37062	0.00000	0.25584
0.080	1.27662	0.36185	0.00000	1.99922	0.00198	0.00000	0.00161	0.00000	0.00000	0.35951	0.00000	0.27864
0.060	1.31394	0.34317	0.00000	1.99941	0.00123	0.00000	0.00123	0.00000	0.00000	0.34151	0.00000	0.31532
0.050	1.34020	0.33003	0.00000	1.99952	0.00089	0.00000	0.00103	0.00000	0.00000	0.32870	0.00000	0.34128
0.040	1.37474	0.31279	0.00000	1.99962	0.00059	0.00000	0.00082	0.00000	0.00000	0.31175	0.00000	0.37546
0.030	1.42257	0.28888	0.00000	1.99974	0.00033	0.00000	0.00060	0.00000	0.00000	0.28813	0.00000	0.42299
0.020	1.49496	0.25272	0.00000	1.99985	0.00013	0.00000	0.00037	0.00000	0.00000	0.25221	0.00000	0.49510
0.010	1.62269	0.18893	0.00000	1.99997	0.00002	0.00000	0.00015	0.00000	0.00000	0.18857	0.00000	0.62251
0.008	1.66171	0.16939	0.00000	1.99999	0.00001	0.00000	0.00011	0.00000	0.00000	0.16910	0.00000	0.66151
0.006	1.71167	0.14444	0.00000	2.00002	0.00001	0.00000	0.00007	0.00000	0.00000	0.14415	0.00000	0.71144
300.000	1.99511	0.00244	0.00002	1.99849	0.00037	0.00000	0.00302	0.00000	0.00000	0.00000	0.00000	0.99754
400.000	1.99617	0.00190	0.00001	1.99879	0.00021	0.00000	0.00241	0.00000	0.00000	0.00000	0.00001	0.99809
500.000	1.99607	0.00192	0.00001	1.99871	0.00017	0.00000	0.00251	0.00001	0.00000	0.00000	0.00007	0.99807
600.000	1.99373	0.00299	0.00003	1.99787	0.00022	0.00000	0.00402	0.00003	0.00000	0.00000	0.00024	0.99698

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



NO	
RHO (G/CC)	1.710
E_0 (KCAL/MOLE)	-20.29
D_{C-J}(M/SEC)	8181.
P_{C-J}(KBAR)	266.1
T_{C-J}(K)	1977.

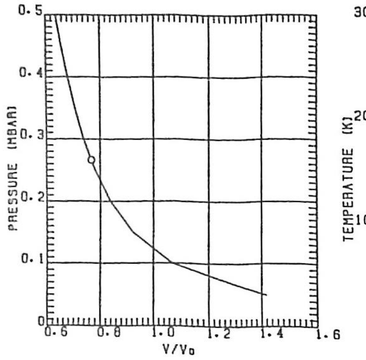
DATE 82-10-21

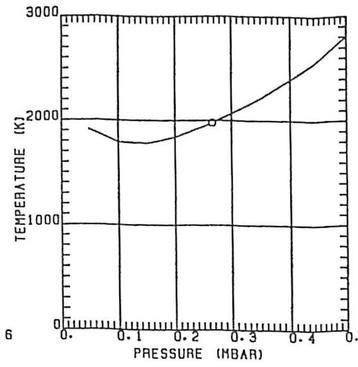
********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

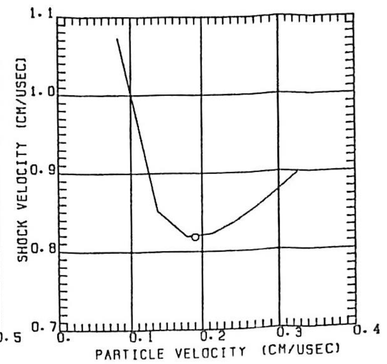
NQ RHO = 1.7100 G/CC, EO = -2.029000E+04 CAL/MOLE

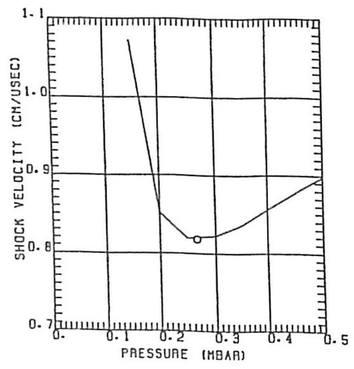
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3729	0.3847	0.3981	0.4139	0.4330	0.4574	0.4906	0.5402	0.6260	0.8289
TEMP (DEG K)	2804.2	2589.7	2393.7	2218.1	2065.6	1938.7	1840.0	1783.7	1795.0	1911.3
US (M/SEC)	8983.2	8770.5	8560.9	8368.2	8221.2	8193.0	8519.5	10724.6	0.0	0.0
UP (M/SEC)	3254.9	3000.5	2732.4	2445.9	2134.0	1784.4	1372.8	817.9	0.0	0.0
H2O (MOLE)	1.9927	1.9941	1.9949	1.9952	1.9950	1.9939	1.9912	1.9839	1.9577	1.8096
CO2 (MOLE)	0.0035	0.0029	0.0025	0.0024	0.0025	0.0031	0.0044	0.0080	0.0204	0.0785
CO (MOLE)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0015	0.0334
N2 (MOLE)	1.9976	1.9981	1.9984	1.9985	1.9984	1.9981	1.9974	1.9956	1.9901	1.9735
H2 (MOLE)	0.0005	0.0004	0.0003	0.0003	0.0004	0.0006	0.0010	0.0028	0.0123	0.0940
O2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0046	0.0037	0.0032	0.0030	0.0031	0.0037	0.0052	0.0089	0.0198	0.0531
OH (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0084
NO (MOLE)	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	0.9964	0.9971	0.9975	0.9976	0.9975	0.9969	0.9956	0.9918	0.9780	0.8797

K-H-T HUGONIOT









NO
RHO (G/CC) 1.710
E_0 (KCAL/MOLE) -20.29

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

AMMONIUM PICRATE RHO = 1.7200 G/CC EO = -9.297700E+04 CAL/MOLE

LN P = -3.79091549 E+00 -2.46733665 E+00LN V 3.61943662 E-01LN V**2 -3.98911834 E-02LN V**3 1.42162666 E-03LN V**4

LN T = 7.55909157 E+00. -4.06212866 E-01LN V 1.22833312 E-01LN V**2 -2.11968459 E-02LN V**3 1.24678994 E-03LN V**4

LN E = -1.65277100 E+00 -4.09183562 E-01LNP 6.77009225 E-02LN P**2 5.33904508 E-03LN P**3 1.54733163 E-04LN P**4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (541.924)	0.3357	3764.3 (3562.3)	-1278.9	0.15351 (0.14873)	3.4075	175.4
400.000 (414.607)	0.3635	3397.2 (3358.5)	-949.0	0.13971 (0.13878)	3.3284	711.2
300.000 (302.106)	0.4003	3058.5 (3137.2)	-628.4	0.12629 (0.12793)	3.2348	1322.0
* 230.191 (228.869)	0.4367	2821.3 (2959.2)	-397.9	0.11665 (0.11956)	3.1526	1825.5
200.000 (196.414)	0.4585	2769.4 (2867.0)	-318.5	0.11332 (0.11565)	3.1072	2091.8
100.000 (95.521)	0.5831	2492.4 (2483.3)	-0.5	0.10002 (0.10058)	2.8935	3200.6
80.000 (76.420)	0.6304	2399.9 (2379.9)	79.6	0.09667 (0.09690)	2.8274	3500.9
60.000 (57.509)	0.6982	2281.1 (2257.2)	170.7	0.09286 (0.09280)	2.7431	3858.2
50.000 (48.116)	0.7455	2207.8 (2185.3)	221.7	0.09072 (0.09053)	2.6904	4068.9
40.000 (38.710)	0.8091	2122.0 (2102.4)	277.5	0.08839 (0.08805)	2.6261	4313.2
30.000 (28.723)	0.9082	2017.1 (1996.9)	340.1	0.08577 (0.08527)	2.5381	4627.2
20.000 (19.613)	1.0592	1879.6 (1874.6)	416.2	0.08258 (0.08202)	2.4261	4996.7
10.000 (10.149)	1.4055	1683.9 (1693.0)	516.9	0.07837 (0.07783)	2.2346	5563.1
8.000 (8.191)	1.5491	1630.6 (1641.1)	543.5	0.07726 (0.07676)	2.1730	5730.5
6.000 (6.196)	1.7657	1568.1 (1578.3)	574.4	0.07597 (0.07554)	2.0934	5938.0
5.000 (5.182)	1.9250	1531.7 (1540.7)	592.4	0.07522 (0.07484)	2.0430	6064.9
4.000 (4.156)	2.1481	1490.2 (1497.1)	612.9	0.07436 (0.07405)	1.9813	6216.0
3.000 (3.117)	2.4914	1440.8 (1444.3)	637.4	0.07333 (0.07313)	1.9019	6404.5
2.000 (2.067)	3.1121	1378.0 (1376.5)	668.9	0.07201 (0.07196)	1.7914	6658.5
1.000 (1.017)	4.7245	1284.6 (1277.2)	716.5	0.07002 (0.07020)	1.6106	7063.4
0.800 (0.809)	5.4591	1257.5 (1249.1)	730.5	0.06944 (0.06968)	1.5556	7186.8
0.600 (0.603)	6.6256	1224.0 (1215.4)	747.9	0.06871 (0.06901)	1.4880	7341.6
0.500 (0.500)	7.5239	1203.3 (1195.2)	758.7	0.06826 (0.06859)	1.4471	7437.5
0.400 (0.398)	8.8339	1178.6 (1171.5)	771.6	0.06772 (0.06807)	1.3995	7552.9
0.300 (0.297)	10.9502	1147.5 (1142.3)	787.9	0.06704 (0.06741)	1.3424	7699.0
0.200 (0.196)	15.0329	1104.5 (1102.9)	810.3	0.06610 (0.06646)	1.2713	7900.3
0.100 (0.097)	26.6402	1032.5 (1037.2)	847.6	0.06454 (0.06480)	1.1795	8232.3
0.080 (0.078)	32.2170	1010.0 (1015.8)	859.1	0.06406 (0.06426)	1.1586	8336.2
0.060 (0.059)	41.2572	981.0 (987.7)	873.6	0.06345 (0.06357)	1.1378	8467.8
0.050 (0.049)	48.3011	962.8 (969.6)	882.7	0.06307 (0.06313)	1.1282	8550.0
0.040 (0.040)	58.6272	940.7 (947.1)	893.4	0.06262 (0.06260)	1.1201	8649.5
0.030 (0.030)	75.3093	912.4 (917.6)	906.9	0.06205 (0.06193)	1.1151	8776.0
0.020 (0.020)	107.2149	872.9 (875.2)	925.2	0.06129 (0.06102)	1.1177	8951.2
0.010 (0.010)	195.8223	805.9 (802.7)	954.4	0.06007 (0.05966)	1.1443	9243.3
0.008 (0.008)	237.5924	784.6 (780.0)	963.2	0.05970 (0.05930)	1.1578	9335.4
0.006 (0.006)	304.5820	757.0 (751.7)	974.1	0.05924 (0.05890)	1.1779	9452.4
0.005 (0.005)	356.3130	739.6 (734.5)	980.8	0.05896 (0.05870)	1.1921	9525.6
0.004 (0.004)	431.5657	718.3 (714.4)	988.7	0.05863 (0.05850)	1.2107	9614.1
0.003 (0.003)	552.0154	691.0 (690.4)	998.6	0.05822 (0.05836)	1.2362	9726.2
0.002 (0.002)	779.6179	652.8 (660.8)	1011.7	0.05767 (0.05840)	1.2745	9879.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

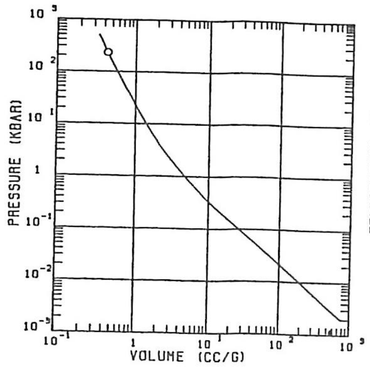
AMMONIUM PICRATE RHO = 1.7200 G/CC EO = -9.297700E+04 CAL/MOLE

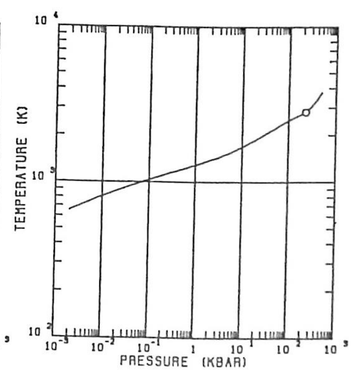
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

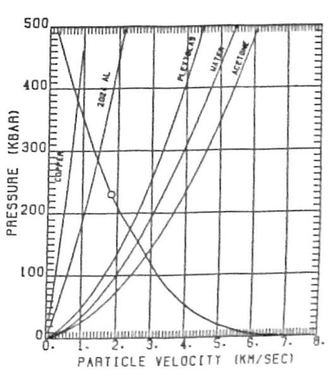
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
230.191	2.99346	1.97729	0.05068	1.99849	0.00309	0.00002	0.00216	0.00039	0.00001	0.00000	0.00085	3.97203
200.000	2.99054	1.96838	0.07178	1.99827	0.00493	0.00001	0.00290	0.00033	0.00001	0.00001	0.00056	3.95983
100.000	2.95481	1.88859	0.26784	1.99534	0.03071	0.00000	0.00925	0.00012	0.00002	0.00027	0.00006	3.84331
80.000	2.93262	1.85398	0.35931	1.99389	0.04764	0.00000	0.01219	0.00007	0.00002	0.00070	0.00003	3.78601
60.000	2.89359	1.80845	0.48947	1.99177	0.07744	0.00000	0.01645	0.00004	0.00001	0.00214	0.00001	3.69995
50.000	2.86229	1.78188	0.57393	1.99036	0.10081	0.00000	0.01927	0.00003	0.00001	0.00399	0.00001	3.64020
40.000	2.81584	1.75337	0.67741	1.98863	0.13405	0.00000	0.02273	0.00002	0.00001	0.00800	0.00000	3.56122
30.000	2.74624	1.72979	0.79418	1.98677	0.18031	0.00000	0.02646	0.00001	0.00001	0.01688	0.00000	3.45915
20.000	2.61959	1.72174	0.93695	1.98464	0.24976	0.00000	0.03073	0.00000	0.00000	0.04228	0.00000	3.29905
10.000	2.35448	1.77865	1.08824	1.98391	0.34846	0.00000	0.03219	0.00000	0.00000	0.12439	0.00000	3.00877
8.000	2.26596	1.81077	1.11252	1.98436	0.37096	0.00000	0.03128	0.00000	0.00000	0.15808	0.00000	2.91869
6.000	2.15614	1.85705	1.12981	1.98526	0.39378	0.00000	0.02949	0.00000	0.00000	0.20292	0.00000	2.81027
5.000	2.09116	1.88793	1.13301	1.98593	0.40505	0.00000	0.02814	0.00000	0.00000	0.23079	0.00000	2.74829
4.000	2.01808	1.92640	1.12915	1.98683	0.41596	0.00000	0.02635	0.00000	0.00000	0.26322	0.00000	2.68126
3.000	1.93520	1.97577	1.11330	1.98800	0.42646	0.00000	0.02400	0.00000	0.00000	0.30118	0.00000	2.60976
2.000	1.84085	2.04324	1.07271	1.98960	0.43608	0.00000	0.02081	0.00000	0.00000	0.34592	0.00000	2.53813
1.000	1.73256	2.14973	0.96803	1.99194	0.44381	0.00000	0.01612	0.00000	0.00000	0.39973	0.00000	2.48254
0.800	1.70941	2.18111	0.92844	1.99259	0.44497	0.00000	0.01483	0.00000	0.00000	0.41169	0.00000	2.47879
0.600	1.68731	2.21992	0.87291	1.99335	0.44537	0.00000	0.01331	0.00000	0.00000	0.42368	0.00000	2.48352
0.500	1.67764	2.24354	0.83534	1.99379	0.44501	0.00000	0.01242	0.00000	0.00000	0.42936	0.00000	2.49176
0.400	1.66984	2.27109	0.78806	1.99430	0.44419	0.00000	0.01140	0.00000	0.00000	0.43443	0.00000	2.50642
0.300	1.66624	2.30465	0.72453	1.99491	0.44219	0.00000	0.01019	0.00000	0.00000	0.43814	0.00000	2.53268
0.200	1.67228	2.34816	0.63148	1.99567	0.43728	0.00000	0.00867	0.00000	0.00000	0.43872	0.00000	2.58163
0.100	1.70679	2.41114	0.47102	1.99676	0.42165	0.00000	0.00650	0.00000	0.00000	0.43091	0.00000	2.68694
0.080	1.72241	2.42772	0.42224	1.99705	0.41478	0.00000	0.00591	0.00000	0.00000	0.42698	0.00000	2.72302
0.060	1.74535	2.44654	0.36166	1.99740	0.40391	0.00000	0.00521	0.00000	0.00000	0.42146	0.00000	2.77031
0.050	1.76133	2.45693	0.32491	1.99760	0.39574	0.00000	0.00481	0.00000	0.00000	0.41786	0.00000	2.80031
0.040	1.78206	2.46765	0.28274	1.99783	0.38476	0.00000	0.00436	0.00000	0.00000	0.41333	0.00000	2.83627
0.030	1.81081	2.47839	0.23253	1.99810	0.36853	0.00000	0.00383	0.00000	0.00000	0.40747	0.00000	2.88161
0.020	1.85520	2.48722	0.17048	1.99842	0.34159	0.00000	0.00317	0.00000	0.00000	0.39923	0.00000	2.94307
0.010	1.94159	2.48451	0.08952	1.99888	0.28519	0.00000	0.00227	0.00000	0.00000	0.38491	0.00000	3.04103
0.008	1.97200	2.47889	0.07036	1.99900	0.26503	0.00000	0.00203	0.00000	0.00000	0.37998	0.00000	3.07076
0.006	2.01353	2.46831	0.05000	1.99914	0.23760	0.00000	0.00174	0.00000	0.00000	0.37314	0.00000	3.10854
0.005	2.04110	2.45977	0.03952	1.99922	0.21972	0.00000	0.00158	0.00000	0.00000	0.36841	0.00000	3.13229
0.004	2.07602	2.44755	0.02903	1.99932	0.19773	0.00000	0.00140	0.00000	0.00000	0.36209	0.00000	3.16132
0.003	2.12289	2.42923	0.01881	1.99942	0.16957	0.00000	0.00118	0.00000	0.00000	0.35289	0.00000	3.19904
0.002	2.19226	2.39922	0.00947	1.99956	0.13157	0.00000	0.00092	0.00000	0.00000	0.33740	0.00000	3.25389
300.000	2.99544	1.98267	0.03543	1.99779	0.00174	0.00009	0.00161	0.00081	0.00001	0.00000	0.00282	3.98190
400.000	2.99594	1.98190	0.02698	1.99413	0.00106	0.00051	0.00136	0.00189	0.00001	0.00000	0.01037	3.99113
500.000	2.99489	1.97161	0.02621	1.98525	0.00088	0.00189	0.00151	0.00390	0.00002	0.00000	0.02800	4.00218

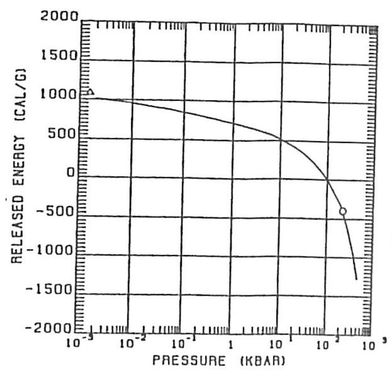
PRESS ;KBAR, PRODUCTS ;MOLES

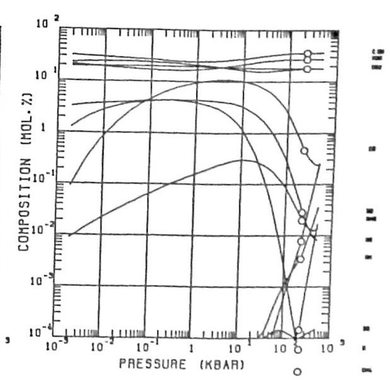
K-H-T ISENTROPE THRU C-J POINT











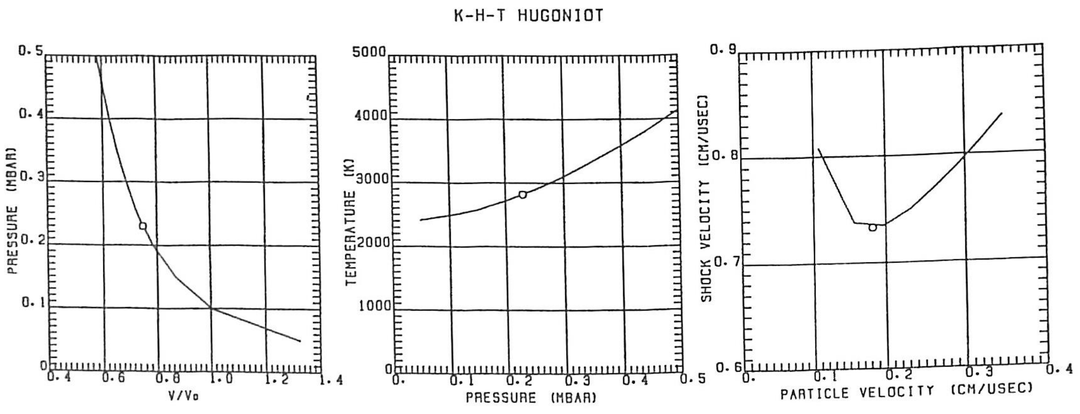
AMMONIUM PICRATE
RHO (G/CC) 1.720
E_0 (KCAL/MOLE) -92.98
D_{C-J} (M/SEC) 7331.
P_{C-J} (KBAR) 230.2
T_{C-J} (K) 2821.

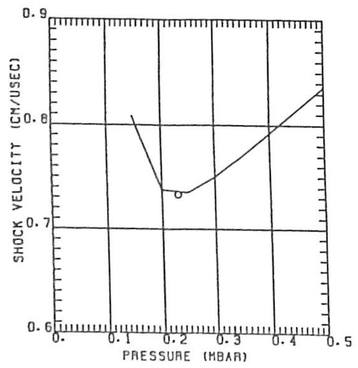
DATE 82-10-21

********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

AMMONIUM PICRATE RHO = 1.7200 G/CC, EO = -9.297700E+04 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3397	0.3521	0.3659	0.3819	0.4011	0.4251	0.4571	0.5038	0.5828	0.7700
TEMP (DEG K)	4133.4	3849.1	3581.8	3331.5	3101.1	2894.9	2718.4	2580.3	2487.3	2409.2
US (M/SEC)	8361.8	8144.0	7921.3	7700.9	7498.9	7353.4	7376.2	8084.5	0.0	0.0
UP (M/SEC)	3476.5	3212.5	2935.9	2642.4	2325.9	1976.6	1576.4	1078.7	0.0	0.0
H2O (MOLE)	2.9895	2.9922	2.9939	2.9948	2.9949	2.9942	2.9917	2.9843	2.9555	2.7808
CO2 (MOLE)	1.9472	1.9629	1.9730	1.9786	1.9806	1.9792	1.9727	1.9535	1.8904	1.6388
CO (MOLE)	0.0527	0.0450	0.0405	0.0385	0.0395	0.0456	0.0621	0.1083	0.2636	0.9415
N2 (MOLE)	1.9748	1.9849	1.9916	1.9955	1.9975	1.9984	1.9985	1.9978	1.9954	1.9865
H2 (MOLE)	0.0020	0.0018	0.0017	0.0017	0.0020	0.0026	0.0042	0.0093	0.0302	0.1636
O2 (MOLE)	0.0037	0.0019	0.0008	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0028	0.0023	0.0019	0.0018	0.0018	0.0020	0.0026	0.0042	0.0091	0.0270
OH (MOLE)	0.0085	0.0052	0.0031	0.0017	0.0009	0.0005	0.0003	0.0002	0.0001	0.0001
H (MOLE)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0075
NO (MOLE)	0.0477	0.0280	0.0149	0.0072	0.0032	0.0013	0.0005	0.0002	0.0001	0.0000
C(S) (MOLE)	4.0002	3.9920	3.9865	3.9829	3.9798	3.9752	3.9652	3.9381	3.8458	3.4122





AMMONIUM PICRATE
RHO (G/CC) 1.720
E_0 (KCAL/MOLE) -92.98

DATE 82-10-21

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

PICRIC ACID RHO = 1.7670 G/CC EO = -5.170800E+04 CAL/MOLE

LN P = -3.76940441 E+00 -2.42032146 E+00LN V 3.38408351 E-01LN V*2 -3.51651907 E-02LN V*3 1.16365729 E-03LN V*4

LN T = 7.68496895 E+00 -4.42176521 E-01LN V 1.38053417 E-01LN V*2 -2.31616385 E-02LN V*3 1.38073019 E-03LN V*4

LN E = -1.64253712 E+00 4.28126812 E-01LNP 6.94395900 E-02LN P*2 5.39855659 E-03LN P*3 1.54112640 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (541.772)	0.3292	4468.2 (4361.0)	-1245.7	0.15212 (0.14842)	3.3088	331.8
400.000 (416.630)	0.3568	4085.8 (4081.7)	-922.8	0.13861 (0.13799)	3.2351	864.1
300.000 (304.129)	0.3938	3713.9 (3777.4)	-604.1	0.12528 (0.12664)	3.1465	1475.3
* 244.145 (244.594)	0.4223	3495.2 (3584.5)	-418.6	0.11752 (0.11971)	3.0852	1873.6
200.000 (196.791)	0.4534	3377.1 (3405.2)	-295.9	0.11238 (0.11381)	3.0239	2259.1
100.000 (95.193)	0.5815	2932.6 (2890.3)	52.6	0.09780 (0.09810)	2.8191	3386.7
80.000 (75.969)	0.6305	2793.0 (2753.6)	140.4	0.09413 (0.09427)	2.7554	3693.4
60.000 (57.038)	0.7007	2621.5 (2593.6)	239.4	0.08998 (0.09000)	2.6746	4057.2
50.000 (47.645)	0.7499	2519.3 (2500.4)	294.7	0.08767 (0.08763)	2.6240	4272.2
40.000 (38.320)	0.8156	2402.5 (2394.7)	355.0	0.08515 (0.08504)	2.5627	4519.4
30.000 (28.620)	0.9157	2267.4 (2264.2)	421.6	0.08236 (0.08213)	2.4807	4830.4
20.000 (19.525)	1.0720	2097.4 (2110.9)	501.0	0.07904 (0.07873)	2.3738	5206.1
10.000 (10.146)	1.4282	1865.7 (1889.1)	605.1	0.07468 (0.07432)	2.1923	5777.9
8.000 (8.203)	1.5758	1804.5 (1826.8)	632.3	0.07355 (0.07319)	2.1339	5947.0
6.000 (6.214)	1.7990	1733.9 (1751.8)	663.3	0.07225 (0.07189)	2.0583	6157.3
5.000 (5.203)	1.9631	1692.7 (1707.4)	681.7	0.07148 (0.07114)	2.0104	6285.9
4.000 (4.177)	2.1932	1645.8 (1656.0)	702.8	0.07059 (0.07030)	1.9516	6439.3
3.000 (3.135)	2.5480	1590.3 (1594.4)	728.0	0.06954 (0.06932)	1.8758	6631.2
2.000 (2.080)	3.1913	1520.3 (1516.4)	760.6	0.06818 (0.06807)	1.7697	6890.4
1.000 (1.023)	4.8695	1417.8 (1404.9)	810.0	0.06611 (0.06620)	1.5948	7305.0
0.800 (0.813)	5.6371	1388.4 (1374.3)	824.6	0.06550 (0.06564)	1.5413	7431.7
0.600 (0.605)	6.8601	1352.3 (1338.1)	842.9	0.06473 (0.06494)	1.4749	7590.8
0.500 (0.501)	7.8050	1330.3 (1316.8)	854.2	0.06426 (0.06449)	1.4347	7689.6
0.400 (0.398)	9.1865	1304.2 (1292.2)	867.7	0.06369 (0.06396)	1.3874	7808.7
0.300 (0.296)	11.4263	1271.6 (1262.5)	884.9	0.06298 (0.06326)	1.3304	7959.5
0.200 (0.195)	15.7650	1227.4 (1223.6)	908.7	0.06198 (0.06228)	1.2585	8167.3
0.100 (0.097)	28.1738	1155.8 (1161.1)	948.2	0.06033 (0.06056)	1.1634	8510.1
0.080 (0.078)	34.1413	1133.5 (1141.3)	960.9	0.05980 (0.06000)	1.1409	8617.1
0.060 (0.059)	43.8764	1105.8 (1115.3)	976.5	0.05914 (0.05928)	1.1178	8753.2
0.050 (0.049)	51.4966	1088.8 (1098.6)	986.1	0.05874 (0.05883)	1.1065	8838.4
0.040 (0.039)	62.7017	1068.3 (1077.9)	997.7	0.05825 (0.05827)	1.0962	8941.6
0.030 (0.030)	80.9063	1042.6 (1050.8)	1012.4	0.05764 (0.05757)	1.0884	9073.3
0.020 (0.020)	116.0414	1007.5 (1012.0)	1032.3	0.05681 (0.05661)	1.0869	9256.6
0.010 (0.010)	215.4107	950.3 (946.5)	1064.5	0.05546 (0.05512)	1.1073	9565.3
0.008 (0.008)	262.9473	932.4 (926.5)	1074.5	0.05504 (0.05471)	1.1192	9663.6
0.006 (0.006)	340.0422	909.8 (902.3)	1086.9	0.05452 (0.05423)	1.1377	9789.5
0.005 (0.005)	400.2192	895.7 (888.1)	1094.6	0.05420 (0.05397)	1.1512	9868.7
0.004 (0.004)	488.5176	878.5 (872.3)	1103.8	0.05382 (0.05370)	1.1692	9964.9
0.003 (0.003)	631.5884	856.5 (854.9)	1115.4	0.05333 (0.05344)	1.1945	10087.6
0.002 (0.002)	906.6689	825.8 (837.8)	1131.1	0.05268 (0.05327)	1.2336	10257.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-21>> **********

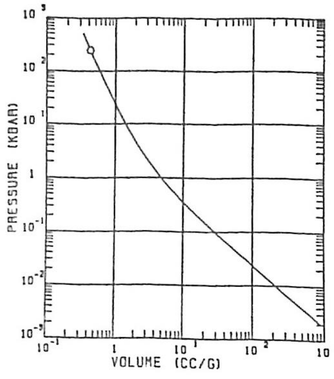
PICRIC ACID RHO = 1.7670 G/CC EO = -5.170800E+04 CAL/MOLE

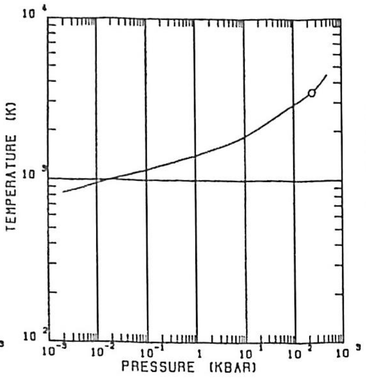
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

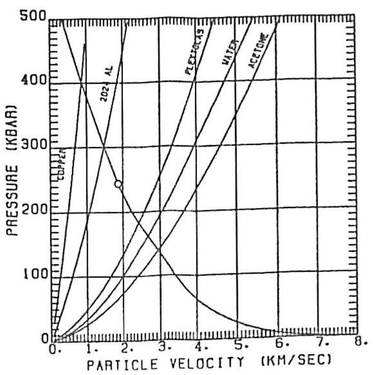
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
244.145	1.49081	2.65457	0.19236	1.49629	0.00471	0.00021	0.00225	0.00212	0.00005	0.00001	0.00516	3.15306
200.000	1.48679	2.61332	0.28170	1.49704	0.00791	0.00009	0.00292	0.00169	0.00006	0.00002	0.00299	3.10496
100.000	1.45765	2.39922	0.74304	1.49687	0.03255	0.00000	0.00592	0.00052	0.00008	0.00031	0.00034	2.85743
80.000	1.44212	2.32016	0.91707	1.49642	0.04592	0.00000	0.00700	0.00032	0.00007	0.00063	0.00016	2.76214
60.000	1.41697	2.22111	1.14059	1.49577	0.06740	0.00000	0.00841	0.00016	0.00006	0.00145	0.00006	2.63685
50.000	1.39776	2.16214	1.27782	1.49535	0.08350	0.00000	0.00928	0.00010	0.00005	0.00237	0.00003	2.55767
40.000	1.37119	2.09769	1.43335	1.49486	0.10518	0.00000	0.01026	0.00006	0.00004	0.00409	0.00001	2.46493
30.000	1.33322	2.03055	1.60565	1.49438	0.13498	0.00000	0.01124	0.00003	0.00003	0.00745	0.00000	2.35638
20.000	1.26940	1.95994	1.81071	1.49382	0.17982	0.00000	0.01235	0.00001	0.00002	0.01612	0.00000	2.21324
10.000	1.14976	1.91493	2.02039	1.49372	0.24790	0.00000	0.01256	0.00000	0.00001	0.04175	0.00000	2.02292
8.000	1.11193	1.91631	2.05546	1.49388	0.26553	0.00000	0.01224	0.00000	0.00000	0.05209	0.00000	1.97613
6.000	1.06526	1.92462	2.08553	1.49419	0.28541	0.00000	0.01163	0.00000	0.00000	0.06594	0.00000	1.92391
5.000	1.03826	1.93506	2.09165	1.49442	0.29588	0.00000	0.01116	0.00000	0.00000	0.07456	0.00000	1.89873
4.000	1.00795	1.95136	2.08936	1.49473	0.30695	0.00000	0.01054	0.00000	0.00000	0.08465	0.00000	1.87464
3.000	0.97355	1.97697	2.07255	1.49516	0.31888	0.00000	0.00969	0.00000	0.00000	0.09652	0.00000	1.85396
2.000	0.93413	2.01984	2.02623	1.49575	0.33206	0.00000	0.00851	0.00000	0.00000	0.11053	0.00000	1.84340
1.000	0.88776	2.10425	1.90378	1.49665	0.34828	0.00000	0.00670	0.00000	0.00000	0.12695	0.00000	1.86507
0.800	0.87756	2.13310	1.85629	1.49691	0.35247	0.00000	0.00618	0.00000	0.00000	0.13035	0.00000	1.88029
0.600	0.86755	2.17156	1.78938	1.49722	0.35726	0.00000	0.00557	0.00000	0.00000	0.13342	0.00000	1.90567
0.500	0.86291	2.19666	1.74382	1.49740	0.35999	0.00000	0.00520	0.00000	0.00000	0.13465	0.00000	1.92490
0.400	0.85885	2.22778	1.68565	1.49761	0.36312	0.00000	0.00478	0.00000	0.00000	0.13543	0.00000	1.95117
0.300	0.85609	2.26872	1.60654	1.49787	0.36681	0.00000	0.00427	0.00000	0.00000	0.13535	0.00000	1.98943
0.200	0.85626	2.32773	1.48834	1.49819	0.37135	0.00000	0.00363	0.00000	0.00000	0.13348	0.00000	2.05049
0.100	0.86470	2.43029	1.27480	1.49865	0.37702	0.00000	0.00271	0.00000	0.00000	0.12711	0.00000	2.16783
0.080	0.86921	2.46394	1.20299	1.49877	0.37785	0.00000	0.00246	0.00000	0.00000	0.12463	0.00000	2.20848
0.060	0.87505	2.50522	1.11459	1.49892	0.37910	0.00000	0.00217	0.00000	0.00000	0.12130	0.00000	2.25893
0.050	0.87903	2.53082	1.05940	1.49900	0.37963	0.00000	0.00201	0.00000	0.00000	0.11917	0.00000	2.29065
0.040	0.88418	2.56160	0.99271	1.49910	0.37995	0.00000	0.00182	0.00000	0.00000	0.11657	0.00000	2.32918
0.030	0.89120	2.60008	0.90872	1.49921	0.37983	0.00000	0.00160	0.00000	0.00000	0.11329	0.00000	2.37794
0.020	0.90176	2.65189	0.79456	1.49934	0.37851	0.00000	0.00134	0.00000	0.00000	0.10887	0.00000	2.44472
0.010	0.92213	2.73269	0.61259	1.49952	0.37240	0.00000	0.00099	0.00000	0.00000	0.10200	0.00000	2.55275
0.008	0.92948	2.75632	0.55798	1.49956	0.36920	0.00000	0.00089	0.00000	0.00000	0.10000	0.00000	2.58574
0.006	0.93966	2.78491	0.49063	1.49962	0.36402	0.00000	0.00079	0.00000	0.00000	0.09758	0.00000	2.62689
0.005	0.94656	2.80187	0.44980	1.49965	0.36010	0.00000	0.00073	0.00000	0.00000	0.09613	0.00000	2.65219
0.004	0.95557	2.82130	0.40194	1.49968	0.35451	0.00000	0.00066	0.00000	0.00000	0.09447	0.00000	2.68228
0.003	0.96823	2.84405	0.34378	1.49972	0.34595	0.00000	0.00058	0.00000	0.00000	0.09248	0.00000	2.71967
0.002	0.98837	2.87135	0.26906	1.49977	0.33100	0.00000	0.00048	0.00000	0.00000	0.08996	0.00000	2.76963
300.000	1.49237	2.67373	0.14495	1.49364	0.00310	0.00059	0.00192	0.00324	0.00005	0.00000	0.01079	3.18131
400.000	1.49265	2.68173	0.10391	1.48447	0.00186	0.00237	0.00168	0.00587	0.00006	0.00000	0.02937	3.21436
500.000	1.49111	2.66744	0.08968	1.46812	0.00142	0.00640	0.00177	0.00953	0.00007	0.00000	0.06199	3.24288

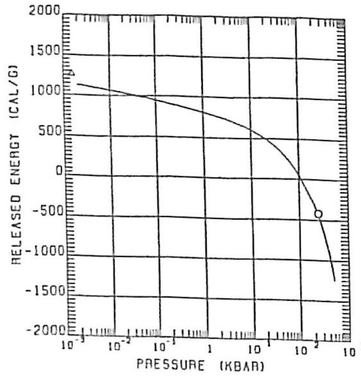
PRESS ;KBAR, PRODUCTS ;MOLES

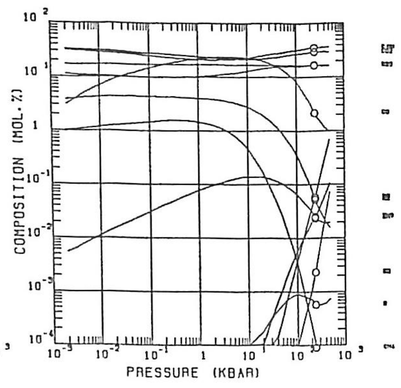
K-H-T ISENTROPE THRU C-J POINT









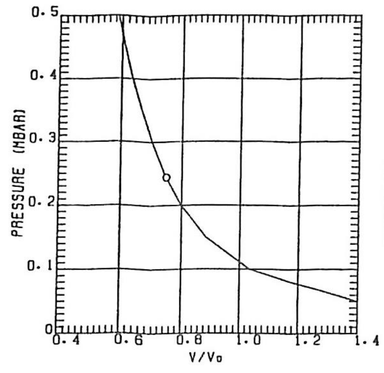


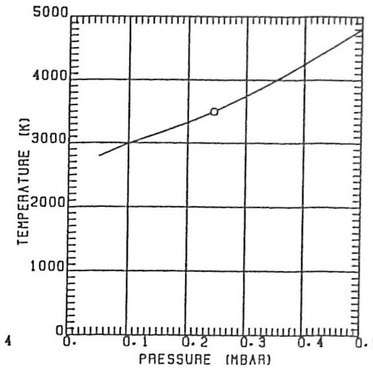
PICRIC ACID

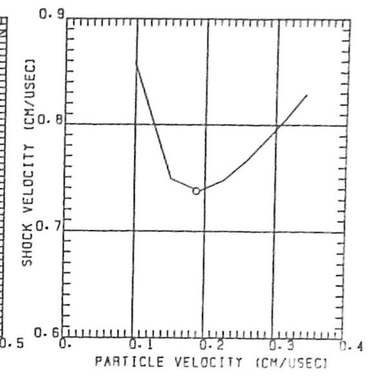
RHO (G/CC)	1.767
E_0 (KCAL/MOLE)	-51.71
D_{C-J} (M/SEC)	7375.
P_{C-J} (KBAR)	244.1
T_{C-J} (K)	3495.

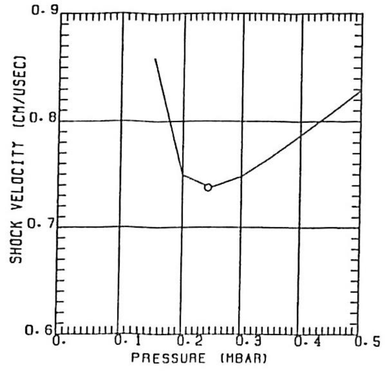
DATE 82-10-21

K-H-T HUGONIOT









PICRIC ACID
RHO (G/CC) 1.767
E_0 (KCAL/MOLE) -51.71

DATE 82-10-21

********** A K-H-T H U G O N I O T <<DATE 82-10-21>>**********

PICRIC ACID RHO = 1.7670 G/CC, EO = -5.170800E+04 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3329	0.3451	0.3589	0.3749	0.3943	0.4188	0.4518	0.5008	0.5853	0.7913
TEMP (DEG K)	4804.2	4516.9	4243.3	3983.9	3741.4	3519.5	3321.8	3150.2	2993.6	2796.8
US (M/SEC)	8289.0	8078.2	7865.4	7660.0	7481.4	7377.0	7492.9	8585.2	0.0	0.0
UP (M/SEC)	3413.7	3152.5	2878.1	2585.8	2269.3	1917.9	1510.6	988.8	0.0	0.0
H2O (MOLE)	1.4856	1.4885	1.4905	1.4917	1.4920	1.4911	1.4881	1.4796	1.4528	1.3271
CO2 (MOLE)	2.6243	2.6479	2.6634	2.6709	2.6699	2.6578	2.6266	2.5518	2.3602	1.8094
CO (MOLE)	0.1405	0.1333	0.1319	0.1370	0.1521	0.1849	0.2544	0.4146	0.8257	2.0536
N2 (MOLE)	1.4543	1.4693	1.4806	1.4884	1.4933	1.4961	1.4973	1.4975	1.4966	1.4933
H2 (MOLE)	0.0024	0.0024	0.0024	0.0027	0.0033	0.0045	0.0071	0.0140	0.0365	0.1433
O2 (MOLE)	0.0102	0.0060	0.0031	0.0015	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0026	0.0023	0.0021	0.0020	0.0020	0.0022	0.0027	0.0038	0.0064	0.0134
OH (MOLE)	0.0161	0.0115	0.0079	0.0053	0.0035	0.0022	0.0014	0.0010	0.0006	0.0003
H (MOLE)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.0046
NO (MOLE)	0.0889	0.0591	0.0367	0.0212	0.0114	0.0057	0.0026	0.0011	0.0004	0.0001
C(S) (MOLE)	3.2352	3.2188	3.2047	3.1920	3.1780	3.1573	3.1189	3.0335	2.8137	2.1323

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		NG	#NITROMETHANE	#METHYL NITRATE	#ETHYL NITRATE	#NITROGLYCOL	#DIETHYLENE GLYCOLDINITR	#NITROGLYCIDE
RHO	(G/CC)	1.591	1.128	1.217	1.105	1.485	1.375	1.332
EO	(KCAL/MOLE)	-89.02	-27.03	-37.20	-45.45	-58.28	-103.54	-90.00
MOL.WEIGHT	(G)	227.088	61.041	77.040	91.067	152.064	196.118	119.078
C		3.0000	1.0000	1.0000	2.0000	2.0000	4.0000	3.0000
H		5.0000	3.0000	3.0000	5.0000	4.0000	8.0000	5.0000
N		3.0000	1.0000	1.0000	1.0000	2.0000	2.0000	1.0000
O		9.0000	2.0000	3.0000	3.0000	6.0000	7.0000	4.0000
DETN.VEL	(M/SEC)	7650.0	6263.9	6858.4	5950.5	7498.3	6828.7	6094.6
PARTICL.VEL	(")	1933.9	1728.4	1876.3	1565.0	1929.5	1712.4	1522.1
C-J PRESS	(KBAR)	235.4	122.1	156.6	102.9	214.9	160.8	123.6
C-J VOLUME	(CC/G)	0.46964	0.64191	0.59689	0.66697	0.50011	0.54490	0.56326
C-J TEMP	(DEG K)	3871.0	3300.0	3820.3	3119.3	4110.5	3295.8	2664.0
C-J S	(CAL/DEG MOL)	56.66	54.23	54.33	55.61	57.03	56.78	56.53
C-J ENERGY	(CAL/G)	446.95	357.00	420.72	292.70	444.92	350.43	276.86
GAMMA		2.956	2.624	2.655	2.802	2.886	2.988	3.004
C-J DETN.HEAT	(CAL)	1455.2	1292.7	1449.6	1274.6	1554.0	1328.4	1029.1
LAMDA		10.2038	7.7831	8.7396	7.3125	9.8936	8.4278	8.1474
VOLUM	(K LITTRE/KG)	0.7835	0.9462	0.9374	0.9209	0.8136	0.8359	0.7834
TOTAL PRODCT	(MOLE)	7.2726	2.9801	2.9907	4.9598	5.0573	8.9870	5.9941
V GAS	(MOLES)	7.2726	2.3607	2.9520	3.4278	5.0573	6.7006	3.8131
V GAS	(CC/MOLE)	14.6648	15.5171	15.5262	15.8207	15.0376	14.6322	15.2655
V SOL C(S)	(CC/G)	0.28744	0.34290	0.32620	0.35374	0.29813	0.32118	0.33836
H2O	(MOL %)	34.1450	47.1341	47.8899	46.3449	39.2021	43.6496	41.1823
CO2	(MOL %)	40.8601	7.2121	20.1152	4.7773	37.6063	15.1348	11.8861
CO	(MOL %)	0.3910	5.5183	12.0087	4.5703	1.9408	3.9288	1.7736
N2	(MOL %)	19.3608	16.4718	16.5013	9.7558	19.2024	11.0405	8.2935
H2	(MOL %)	0.0150	2.1907	1.5992	2.9051	0.1001	0.5977	0.3763
O2	(MOL %)	2.2710	0.0001	0.0019	0.0000	0.3553	0.0004	0.0000
NH3	(MOL %)	0.0013	0.6040	0.3730	0.6477	0.0130	0.1589	0.0948
OH	(MOL %)	0.4268	0.0266	0.1178	0.0141	0.4457	0.0272	0.0028
H	(MOL %)	0.0010	0.0074	0.0178	0.0057	0.0051	0.0027	0.0003
CH4	(MOL %)	0.0000	0.0433	0.0199	0.0868	0.0000	0.0040	0.0025
NO	(MOL %)	2.5280	0.0091	0.0616	0.0029	1.1293	0.0144	0.0010
C(S)	(MOL %)	0.0	20.7826	1.2938	30.8896	0.0	25.4411	36.3867

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		TRINITRO ANISOLE	#TRINITRO PHENETOL	#HEXANITRODIP HENYLOXIDE	#TRINITRO ANILINE	#TETRANITRO ANILINE	#HEXYL	#TMNMTN
RHO	(G/CC)	1.700	1.450	1.700	1.760	1.500	1.670	1.680
EO	(KCAL/MOLE)	-36.61	-48.02	0.0	-27.00	-11.69	9.57	-54.59
MOL.WEIGHT	(G)	243.134	257.161	440.198	228.122	273.119	439.213	286.113
C		7.0000	8.0000	12.0000	6.0000	6.0000	12.0000	4.0000
H		5.0000	7.0000	4.0000	4.0000	3.0000	5.0000	6.0000
N		3.0000	3.0000	6.0000	4.0000	5.0000	7.0000	4.0000
O		7.0000	7.0000	13.0000	6.0000	8.0000	12.0000	11.0000
DETN.VEL	(M/SEC)	7221.7	6337.7	7272.6	7422.9	6968.0	7163.9	8217.8
PARTICL.VEL	(")	1824.9	1629.5	1888.2	1804.9	1803.4	1869.7	2095.1
C-J PRESS	(KBAR)	224.0	149.7	233.4	235.8	188.5	223.7	289.2
C-J VOLUME	(CC/G)	0.43959	0.51234	0.43551	0.43003	0.49412	0.44253	0.44349
C-J TEMP	(DEG K)	3445.0	3246.6	4025.9	3204.4	3943.5	3821.5	4337.4
C-J S	(CAL/DEG MOL)	63.45	63.35	64.66	60.56	59.67	63.91	57.67
C-J ENERGY	(CAL/G)	397.98	317.30	426.06	389.29	388.67	417.73	524.53
GAMMA		2.957	2.889	2.852	3.113	2.864	2.832	2.922
C-J DETN.HEAT	(CAL)	1293.1	1202.1	1387.8	1201.8	1317.9	1328.2	1668.0
LAMDA		9.7605	8.8779	11.0447	9.9289	10.5931	10.6166	10.3144
VOLUM	(K LITTRE/KG)	0.6404	0.6647	0.6099	0.6494	0.6920	0.6201	0.7789
TOTAL PRODCT	(MOLE)	10.9985	12.9858	17.0141	9.9991	10.0031	18.0062	9.1093
V GAS	(MOLES)	6.3642	6.9873	10.9748	6.0555	7.7252	11.1333	9.1093
V GAS	(CC/MOLE)	14.2513	15.4863	15.5580	13.9769	16.3708	15.2881	13.9294
V SOL C(S)	(CC/G)	0.29074	0.32685	0.28904	0.28423	0.31021	0.29264	0.26566
H2O	(MOL %)	22.5477	26.3611	11.5668	19.9079	14.5895	13.6847	32.6337
CO2	(MOL %)	19.5257	12.1079	29.5746	19.4932	27.9736	24.3325	41.7800
CO	(MOL %)	1.9830	3.3020	5.4585	1.0728	9.2351	4.1415	2.1312
N2	(MOL %)	13.5974	11.4874	17.5397	19.9747	24.8953	19.3673	21.2613
H2	(MOL %)	0.1023	0.4007	0.1026	0.0461	0.2574	0.1112	0.0710
O2	(MOL %)	0.0013	0.0002	0.0076	0.0007	0.0042	0.0038	0.3294
NH3	(MOL %)	0.0451	0.1173	0.0338	0.0280	0.0714	0.0423	0.0174
OH	(MOL %)	0.0238	0.0157	0.0656	0.0109	0.0726	0.0463	0.4007
H	(MOL %)	0.0008	0.0017	0.0028	0.0003	0.0057	0.0021	0.0042
CH4	(MOL %)	0.0003	0.0030	0.0003	0.0001	0.0011	0.0003	0.0000
NO	(MOL %)	0.0366	0.0101	0.1516	0.0261	0.1225	0.0987	1.3711
C(S)	(MOL %)	42.1361	46.1929	35.4961	39.4394	22.7717	38.1694	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
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********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		NITROMANNITE	#DIPENTHRITE HEXANITRATE	#NITROCELLULOSE(N13 %)	#TRINITRO BENZENE	#TRINITRO XYLENE	#TRINITRORESORCINE	#TRINITRO CRESOL
RHO	(G/CC)	1.730	1.500	1.200	1.610	1.500	1.830	1.630
EO	(KCAL/MOLE)	-154.02	-233.79	-41.33	-8.48	-0.02	-125.00	-60.29
MOL.WEIGHT	(G)	452.160	524.268	67.383	213.107	241.161	245.106	243.134
C		6.0000	10.0000	1.5000	6.0000	8.0000	6.0000	7.0000
H		8.0000	16.0000	1.7500	3.0000	7.0000	3.0000	5.0000
N		6.0000	6.0000	0.6000	3.0000	3.0000	3.0000	3.0000
O		18.0000	19.0000	2.4500	6.0000	6.0000	8.0000	7.0000
DETN.VEL	(M/SEC)	7954.4	7251.6	5895.0	6957.2	6542.5	7366.6	6889.7
PARTICL.VEL	(")	1950.5	1840.3	1561.2	1794.5	1643.8	1804.2	1745.5
C-J PRESS	(KBAR)	268.4	200.2	110.4	201.0	161.3	243.2	196.0
C-J VOLUME	(CC/G)	0.43630	0.49748	0.61265	0.46091	0.49917	0.41262	0.45807
C-J TEMP	(DEG K)	3653.1	3546.2	3294.7	3739.6	3370.0	2951.4	3256.5
C-J S	(CAL/DEG MOL)	56.03	57.39	57.29	64.09	65.06	59.01	62.69
C-J ENERGY	(CAL/G)	454.64	404.72	291.24	384.84	322.90	388.98	364.09
GAMMA		3.078	2.940	2.776	2.877	2.980	3.083	2.947
C-J DETN.HEAT	(CAL)	1389.5	1382.7	1127.2	1314.4	1291.8	1084.6	1195.5
LAMDA		10.4756	9.3073	9.5064	10.3470	8.5035	11.0666	9.7582
VOLUM	(K LITTRE/KG)	0.7585	0.7926	0.7786	0.6282	0.6545	0.6272	0.6410
TOTAL PRODCT	(MOLE)	14.0181	20.9881	2.6700	9.0000	12.9828	9.0001	10.9968
V GAS	(MOLES)	14.0181	16.9856	2.1445	5.4719	6.4512	6.2841	6.3702
V GAS	(CC/MOLE)	14.0729	14.4988	18.2200	15.6040	14.7535	14.6414	14.8391
V SOL C(S)	(CC/G)	0.27174	0.30250	0.35001	0.30303	0.32128	0.27982	0.30314
H2O	(MOL %)	28.3857	37.6080	31.3571	16.3824	26.2838	16.6358	22.5400
CO2	(MOL %)	42.6923	24.2454	23.8832	22.7035	8.5900	35.7435	19.4975
CO	(MOL %)	0.1096	4.3289	12.5993	4.7612	2.7173	0.7454	2.0850
N2	(MOL %)	19.6563	14.2181	11.1429	16.6040	11.4750	16.6545	13.6076
H2	(MOL %)	0.0030	0.3226	1.1018	0.1727	0.4408	0.0144	0.1161
O2	(MOL %)	5.3728	0.0017	0.0002	0.0024	0.0003	0.0004	0.0005
NH3	(MOL %)	0.0003	0.1048	0.1754	0.0579	0.1442	0.0094	0.0463
OH	(MOL %)	0.2909	0.0497	0.0268	0.0440	0.0202	0.0045	0.0148
H	(MOL %)	0.0002	0.0028	0.0051	0.0025	0.0023	0.0001	0.0006
CH4	(MOL %)	0.0000	0.0014	0.0169	0.0007	0.0033	0.0000	0.0003
NO	(MOL %)	3.4889	0.0466	0.0106	0.0673	0.0133	0.0147	0.0191
C(S)	(MOL %)	0.0	19.0703	19.6808	39.2014	50.3096	30.1774	42.0721

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
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********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		EDNA	#NITROUREA	#NITROGUANIDINE	#DINA	#NENO	#ETRYL	#TNPNEN
RHO	(G/CC)	1.450	1.000	1.550	1.488	1.000	1.500	0.800
EO	(KCAL/MOLE)	-24.71	-67.23	-20.29	-75.39	-122.30	-4.79	0.0
MOL.WEIGHT	(G)	150.094	105.053	104.069	240.130	356.164	301.174	362.170
C		2.0000	1.0000	1.0000	4.0000	6.0000	8.0000	8.0000
H		6.0000	3.0000	4.0000	8.0000	8.0000	7.0000	6.0000
N		4.0000	3.0000	4.0000	4.0000	6.0000	5.0000	6.0000
O		4.0000	3.0000	2.0000	8.0000	12.0000	8.0000	11.0000
DETN.VEL	(M/SEC)	7458.5	5313.7	7570.7	7417.1	5772.2	6842.1	5234.3
PARTICL.VEL	(")	1905.1	1371.5	1788.7	1881.8	1692.6	1772.1	1499.3
C-J PRESS	(KBAR)	206.0	72.9	209.9	207.7	97.7	181.9	62.8
C-J VOLUME	(CC/G)	0.51350	0.74190	0.49273	0.50154	0.70677	0.49400	0.89197
C-J TEMP	(DEG K)	3171.9	2550.8	2167.8	3524.0	3738.6	3584.6	3975.6
C-J S	(CAL/DEG MOL)	52.45	49.61	45.60	55.85	53.54	61.65	51.72
C-J ENERGY	(CAL/G)	433.72	224.78	382.35	423.19	342.35	375.30	268.62
GAMMA		2.915	2.874	3.232	2.941	2.410	2.861	2.491
C-J DETN.HEAT	(CAL)	1290.8	795.3	914.9	1399.1	1142.2	1315.6	1100.0
LAMDA		8.1612	9.0527	7.9684	8.9373	9.3855	9.2599	9.1884
VOLUM	(K LITTRE/KG)	0.9038	0.9114	0.9402	0.8335	0.8889	0.6946	0.9335
TOTAL PRODCT	(MOLE)	6.9887	3.9840	4.9901	9.9915	12.9402	13.9874	13.8548
V GAS	(MOLES)	5.5446	3.9136	3.9993	8.1806	12.9402	8.5513	13.8185
V GAS	(CC/MOLE)	12.9687	19.8351	11.9543	13.9277	19.4532	15.0182	23.3655
V SOL C(S)	(CC/G)	0.29792	0.37016	0.29151	0.29878	0.36113	0.31175	0.38879
H2O	(MOL %)	42.3655	35.7586	39.7178	39.4811	27.3440	24.4592	13.6869
CO2	(MOL %)	6.8847	16.2387	0.1771	18.5804	18.9647	14.3292	8.4102
CO	(MOL %)	1.0695	7.0625	0.0074	3.3270	27.3421	3.9991	48.7791
N2	(MOL %)	28.5210	37.4796	39.9802	19.9255	22.9572	17.7908	21.3536
H2	(MOL %)	0.2863	1.3169	0.0642	0.3267	2.7675	0.3496	6.4355
O2	(MOL %)	0.0002	0.0000	0.0000	0.0014	0.0007	0.0009	0.0003
NH3	(MOL %)	0.1768	0.3412	0.1981	0.1328	0.4159	0.1264	0.5726
OH	(MOL %)	0.0148	0.0019	0.0001	0.0459	0.0808	0.0373	0.0815
H	(MOL %)	0.0010	0.0007	0.0000	0.0026	0.0297	0.0031	0.1015
CH4	(MOL %)	0.0008	0.0309	0.0001	0.0012	0.0605	0.0020	0.2901
NO	(MOL %)	0.0166	0.0007	0.0001	0.0500	0.0369	0.0384	0.0264
C(S)	(MOL %)	20.6627	1.7683	19.8551	18.1252	0.0	38.8640	0.2623

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
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********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	UREA NITRATE	#GUANIDINE NITRATE	#DDNP	#TETRAZENE	# MAN	# ETHYL NITRAMINE	# ETHANOLAMINE DINITRATE
RHO (G/CC)	1.590	0.800	1.580	1.050	1.422	1.000	1.000
EO (KCAL/MOLE)	-134.18	-93.65	-76.69	45.21	-84.31	-16.00	-107.00
MOL.WEIGHT (G)	123.069	122.084	210.107	188.152	94.071	90.082	169.095
C	1.0000	1.0000	6.0000	2.0000	1.0000	2.0000	2.0000
H	5.0000	6.0000	2.0000	8.0000	6.0000	6.0000	7.0000
N	3.0000	4.0000	4.0000	10.0000	2.0000	2.0000	3.0000
O	4.0000	3.0000	5.0000	1.0000	3.0000	2.0000	6.0000
DETN.VEL (M/SEC)	7164.9	4494.6	6098.0	5654.9	7229.9	5770.5	5848.7
PARTICL.VEL(")	1609.3	1207.9	1469.1	1406.0	1762.6	1490.2	1631.9
C-J PRESS (KBAR)	183.3	43.4	141.5	83.5	181.2	86.0	95.4
C-J VOLUME (CC/G)	0.48767	0.91408	0.48043	0.71559	0.53180	0.74175	0.72098
C-J TEMP (DEG K)	1411.5	1973.7	2448.1	1813.9	2100.9	2658.8	3222.2
C-J S(CAL/DEG MOL)	41.96	46.63	59.08	46.36	45.99	52.66	51.91
C-J ENERGY (CAL/G)	309.48	174.35	257.92	236.23	371.25	265.39	318.26
GAMMA	3.452	2.721	3.151	3.022	3.102	2.872	2.584
C-J DETN.HEAT(CAL)	656.9	617.3	798.0	651.7	945.4	1141.6	1134.3
LAMDA	8.5158	7.7433	10.7039	8.8075	7.0444	6.8857	8.4177
VOLUM(K LITTRE/KG)	0.9443	1.0261	0.5865	0.9453	1.0405	1.0009	0.9824
TOTAL PRODCT(MOLE)	5.0000	5.8697	8.9990	9.1785	4.9896	5.5956	6.9459
V GAS (MOLES)	4.7500	5.1205	5.0372	7.2700	4.0009	3.6856	6.7902
V GAS (CC/MOLE)	12.4451	21.1114	16.9501	17.3913	11.5990	15.8780	17.8554
V SOL C(S) (CC/G)	0.30066	0.38835	0.32704	0.35798	0.30486	0.36180	0.35920
H2O (MOL %)	49.9996	44.8518	11.0696	10.8922	59.6829	35.0298	46.2291
CO2 (MOL %)	15.0000	2.4086	21.8420	0.0006	0.2159	0.1309	13.6503
CO (MOL %)	0.0007	1.4410	0.8069	0.0023	0.0109	0.4504	12.8175
N2 (MOL %)	29.9997	33.3856	22.2185	45.5457	19.9375	15.2843	21.2752
H2 (MOL %)	0.0001	3.3511	0.0251	3.9138	0.1293	8.7662	3.0258
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
NH3 (MOL %)	0.0004	1.3748	0.0116	17.8583	0.2085	5.1738	0.6321
OH (MOL %)	0.0000	0.0000	0.0004	0.0000	0.0001	0.0009	0.0261
H (MOL %)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0023	0.0094
CH4 (MOL %)	0.0000	0.4222	0.0000	0.9932	0.0002	1.0277	0.0843
NO (MOL %)	0.0000	0.0000	0.0008	0.0000	0.0000	0.0001	0.0083
C(S) (MOL %)	4.9994	12.7648	44.0251	20.7937	19.8148	34.1335	2.2419

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
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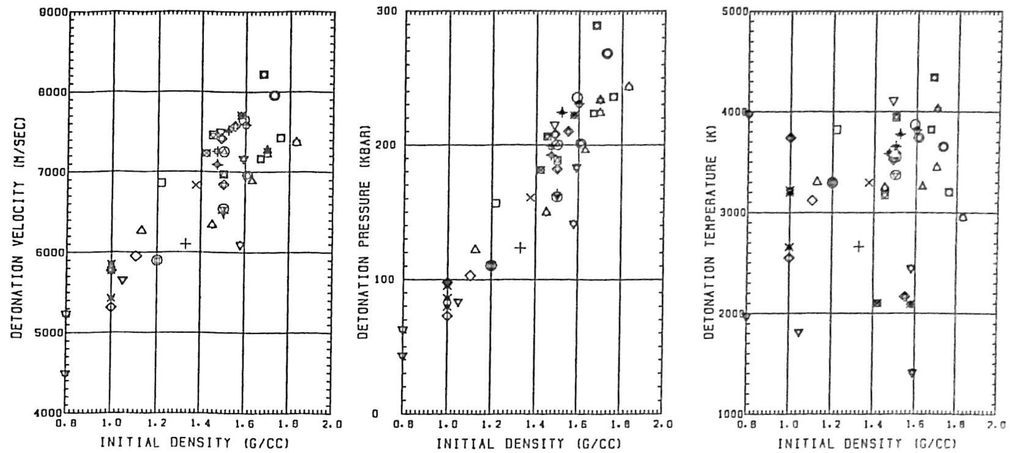
**********K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	ETHYLENEDIAMINE DINITRATE	#DINITRODIMETHYL OXAMIDE	ERYTHRITOL TETRANITRATE	# BUTANETRIOL TRINITRATE	#TRIMETHYLOLETHANE TRINI	GLTN	# TRINITROBENZALDEHYDE
RHO (G/CC)	1.577	1.000	1.600	1.520	1.470	1.470	1.500
EO (KCAL/MOLE)	-155.77	-68.00	-113.00	-97.26	-96.00	-141.00	-31.60
MOL.WEIGHT (G)	186.125	206.116	302.112	241.115	255.142	299.152	241.118
C	2.0000	4.0000	4.0000	4.0000	5.0000	6.0000	7.0000
H	10.0000	6.0000	6.0000	7.0000	9.0000	9.0000	3.0000
N	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	3.0000
O	6.0000	6.0000	12.0000	9.0000	9.0000	11.0000	7.0000
DETN.VEL (M/SEC)	7707.0	5427.1	7585.8	7516.9	7254.1	7092.0	6485.2
PARTICL.VEL(")	1827.5	1472.2	1898.6	1963.2	1863.0	1844.9	1679.2
C-J PRESS (KBAR)	222.1	79.9	230.4	224.3	198.7	192.3	163.4
C-J VOLUME (CC/G)	0.48376	0.72873	0.46857	0.48608	0.50557	0.50331	0.49405
C-J TEMP (DEG K)	2089.0	3194.9	3816.2	3775.6	3584.0	3581.2	3652.5
C-J S(CAL/DEG MOL)	46.16	54.34	56.68	56.80	57.55	58.00	64.09
C-J ENERGY (CAL/G)	399.09	259.02	430.77	460.56	414.75	406.72	336.96
GAMMA	3.217	2.686	2.995	2.829	2.894	2.844	2.862
C-J DETN.HEAT(CAL)	968.1	1049.8	1412.6	1463.1	1431.3	1372.8	1234.3
LAMDA	7.6139	8.7917	10.3340	9.5047	8.8462	9.3538	10.5244
VOLUM(K LITTRE/KG)	0.9860	0.8628	0.7712	0.8109	0.8144	0.7834	0.6222
TOTAL PRODCT(MOLE)	8.9992	8.9353	9.5239	8.9986	10.9905	11.9928	9.9978
V GAS (MOLES)	7.5012	7.2687	9.5239	7.9916	8.4937	9.5790	6.1324
V GAS (CC/MOLE)	11.3185	19.6461	14.8637	14.2233	14.1156	14.7908	16.9901
V SOL C(S) (CC/G)	0.28554	0.36970	0.28947	0.29213	0.30342	0.30651	0.32169
H2O (MOL %)	55.5391	29.6793	31.2733	38.3631	40.2922	36.9469	14.6325
CO2 (MOL %)	5.5556	11.4312	41.7228	28.1990	18.7207	24.7707	23.9495
CO (MOL %)	0.0224	14.5843	0.2767	5.0597	4.0529	5.1305	7.4018
N2 (MOL %)	22.2196	22.1100	19.4421	16.5639	13.5583	12.4305	14.9513
H2 (MOL %)	0.0079	2.8709	0.0096	0.3161	0.4168	0.3791	0.2555
O2 (MOL %)	0.0000	0.0000	3.7287	0.0046	0.0016	0.0018	0.0013
NH3 (MOL %)	0.0089	0.5407	0.0007	0.1119	0.1349	0.1092	0.0615
OH (MOL %)	0.0001	0.0178	0.4307	0.0864	0.0543	0.0543	0.0369
H (MOL %)	0.0000	0.0088	0.0008	0.0042	0.0036	0.0034	0.0032
CH4 (MOL %)	0.0000	0.1001	0.0000	0.0012	0.0020	0.0019	0.0014
NO (MOL %)	0.0002	0.0058	3.1146	0.0987	0.0446	0.0448	0.0424
C(S) (MOL %)	16.6462	18.6510	0.0	11.1913	22.7181	20.1268	38.6625

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

NG RHO = 1.5910 G/CC EO = -8.902300E+04 CAL/MOLE

LN P = -3.44151974 E+00 -2.34543991 E+00LN V 3.63116026 E-01LN V*2 -5.01110964 E-02LN V*3 2.49462179 E-03LN V*4

LN T = 8.05310726 E+00 -2.72354901 E-01LN V 5.47002815 E-02LN V*2 -1.24201886 E-02LN V*3 8.43345653 E-04LN V*4

LN E = -1.61440563 E+00 4.29228365 E-01LNP 6.58586621 E-02LN P*2 5.32058254 E-03LN P*3 1.60255964 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (505.208)	0.3682	4726.9 (4416.5)	-1338.8	0.15602 (0.15228)	3.2312	295.2
400.000 (404.618)	0.3947	4411.7 (4290.8)	-1016.4	0.14252 (0.14137)	3.1586	822.8
300.000 (302.979)	0.4331	4092.3 (4134.0)	-680.7	0.12848 (0.12942)	3.0642	1448.0
* 235.382 (237.090)	0.4697	3871.0 (4007.0)	-446.5	0.11868 (0.12089)	2.9844	1933.9
200.000 (199.821)	0.4977	3795.9 (3921.5)	-333.8	0.11397 (0.11582)	2.9288	2256.6
100.000 (97.971)	0.6412	3506.9 (3590.5)	47.2	0.09803 (0.09886)	2.6987	3452.1
80.000 (78.294)	0.6976	3425.9 (3494.3)	141.3	0.09409 (0.09465)	2.6270	3784.7
60.000 (58.830)	0.7792	3327.1 (3376.7)	247.5	0.08964 (0.08989)	2.5361	4182.6
50.000 (49.163)	0.8371	3267.3 (3305.5)	307.3	0.08714 (0.08722)	2.4794	4418.9
40.000 (39.514)	0.9153	3196.9 (3221.6)	373.6	0.08437 (0.08425)	2.4109	4693.3
30.000 (29.855)	1.0304	3109.3 (3118.2)	449.7	0.08118 (0.08087)	2.3238	5026.1
20.000 (20.122)	1.2267	2989.7 (2979.9)	542.5	0.07730 (0.07679)	2.2033	5461.4
10.000 (10.180)	1.6968	2788.2 (2759.0)	673.3	0.07183 (0.07122)	2.0020	6136.4
8.000 (8.147)	1.8999	2723.5 (2691.1)	709.9	0.07030 (0.06972)	1.9386	6339.3
6.000 (6.099)	2.2130	2639.7 (2605.5)	754.1	0.06845 (0.06793)	1.8584	6592.0
5.000 (5.072)	2.4472	2586.3 (2552.5)	780.7	0.06733 (0.06688)	1.8088	6746.9
4.000 (4.044)	2.7797	2521.5 (2488.6)	811.7	0.06604 (0.06566)	1.7495	6931.5
3.000 (3.019)	3.2972	2438.5 (2408.2)	849.4	0.06446 (0.06419)	1.6760	7161.2
2.000 (2.001)	4.2449	2322.7 (2298.1)	898.9	0.06239 (0.06227)	1.5796	7470.1
1.000 (0.996)	6.7497	2126.5 (2115.9)	976.4	0.05915 (0.05927)	1.4374	7963.7
0.800 (0.796)	7.9074	2064.6 (2057.9)	999.5	0.05818 (0.05836)	1.3983	8115.7
0.600 (0.596)	9.7565	1984.2 (1983.1)	1028.5	0.05697 (0.05721)	1.3533	8307.3
0.500 (0.496)	11.1821	1932.9 (1935.8)	1046.6	0.05621 (0.05650)	1.3279	8426.3
0.400 (0.397)	13.2589	1871.0 (1877.6)	1068.0	0.05531 (0.05564)	1.3004	8569.8
0.300 (0.298)	16.5925	1791.7 (1802.5)	1094.9	0.05419 (0.05455)	1.2705	8751.3
0.200 (0.198)	22.9149	1681.5 (1696.4)	1131.2	0.05267 (0.05304)	1.2390	9000.0
0.100 (0.100)	40.1873	1499.1 (1517.0)	1189.2	0.05024 (0.05055)	1.2112	9405.9
0.080 (0.080)	48.3141	1445.8 (1459.7)	1205.7	0.04955 (0.04978)	1.2080	9533.0
0.060 (0.060)	61.1861	1376.6 (1387.5)	1226.9	0.04867 (0.04880)	1.2073	9692.3
0.050 (0.050)	71.0526	1333.8 (1342.6)	1239.9	0.04812 (0.04820)	1.2085	9791.2
0.040 (0.040)	85.3554	1283.0 (1288.6)	1255.1	0.04749 (0.04749)	1.2113	9910.5
0.030 (0.030)	108.0868	1219.6 (1220.9)	1273.8	0.04670 (0.04660)	1.2166	10060.9
0.020 (0.020)	150.6385	1134.0 (1129.9)	1298.7	0.04566 (0.04543)	1.2257	10266.6
0.010 (0.010)	264.6006	996.5 (989.0)	1337.5	0.04404 (0.04370)	1.2402	10600.1
0.008 (0.008)	317.8794	957.8 (947.2)	1348.2	0.04359 (0.04323)	1.2431	10704.3
0.006 (0.006)	401.3501	907.0 (897.5)	1362.0	0.04301 (0.04271)	1.2447	10833.6
0.005 (0.005)	465.0276	875.8 (868.0)	1370.3	0.04266 (0.04243)	1.2441	10913.4
0.004 (0.004)	556.7661	838.9 (834.1)	1380.1	0.04226 (0.04214)	1.2414	11008.9
0.003 (0.003)	701.7017	793.0 (794.2)	1392.1	0.04175 (0.04187)	1.2341	11128.5
0.002 (0.002)	970.6270	731.3 (745.2)	1407.9	0.04109 (0.04171)	1.2155	11290.0

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

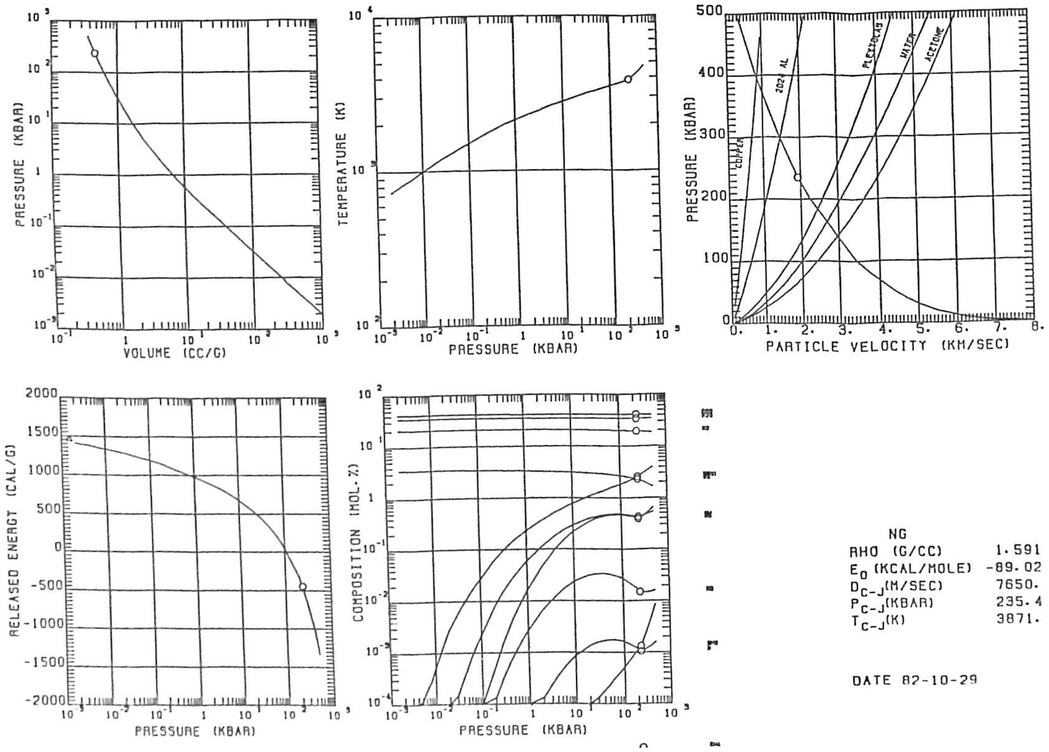
NG RHO = 1.5910 G/CC EO = -8.902300E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
235.382	2.48320	2.97153	0.02847	1.40804	0.00109	0.16518	0.00010	0.03107	0.00008	0.00000	0.18383	0.0
200.000	2.48239	2.96975	0.03025	1.41372	0.00128	0.17150	0.00008	0.03237	0.00009	0.00000	0.17249	0.0
100.000	2.48046	2.96614	0.03386	1.43401	0.00199	0.19327	0.00004	0.03490	0.00012	0.00000	0.13195	0.0
80.000	2.48030	2.96614	0.03386	1.43924	0.00217	0.19860	0.00003	0.03487	0.00012	0.00000	0.12148	0.0
60.000	2.48044	2.96698	0.03303	1.44532	0.00234	0.20448	0.00002	0.03427	0.00013	0.00000	0.10934	0.0
50.000	2.48073	2.96794	0.03207	1.44882	0.00241	0.20770	0.00002	0.03359	0.00013	0.00000	0.10234	0.0
40.000	2.48124	2.96947	0.03054	1.45278	0.00245	0.21118	0.00001	0.03251	0.00012	0.00000	0.09443	0.0
30.000	2.48216	2.97195	0.02806	1.45744	0.00242	0.21502	0.00001	0.03074	0.00011	0.00000	0.08511	0.0
20.000	2.48387	2.97614	0.02387	1.46334	0.00226	0.21949	0.00001	0.02767	0.00010	0.00000	0.07332	0.0
10.000	2.48755	2.98405	0.01596	1.47207	0.00173	0.22556	0.00000	0.02143	0.00006	0.00000	0.05586	0.0
8.000	2.48881	2.98647	0.01354	1.47458	0.00153	0.22727	0.00000	0.01933	0.00005	0.00000	0.05084	0.0
6.000	2.49042	2.98935	0.01066	1.47763	0.00126	0.22941	0.00000	0.01665	0.00004	0.00000	0.04474	0.0
5.000	2.49142	2.99101	0.00900	1.47946	0.00110	0.23074	0.00000	0.01499	0.00003	0.00000	0.04108	0.0
4.000	2.49256	2.99280	0.00721	1.48156	0.00092	0.23233	0.00000	0.01308	0.00002	0.00000	0.03689	0.0
3.000	2.49392	2.99474	0.00528	1.48406	0.00071	0.23432	0.00000	0.01080	0.00002	0.00000	0.03188	0.0
2.000	2.49558	2.99679	0.00323	1.48721	0.00046	0.23702	0.00000	0.00800	0.00001	0.00000	0.02557	0.0
1.000	2.49769	2.99885	0.00118	1.49167	0.00019	0.24122	0.00000	0.00433	0.00000	0.00000	0.01667	0.0
0.800	2.49818	2.99921	0.00081	1.49284	0.00014	0.24240	0.00000	0.00346	0.00000	0.00000	0.01432	0.0
0.600	2.49871	2.99954	0.00048	1.49421	0.00009	0.24380	0.00000	0.00253	0.00000	0.00000	0.01159	0.0
0.500	2.49899	2.99969	0.00033	1.49499	0.00006	0.24462	0.00000	0.00203	0.00000	0.00000	0.01003	0.0
0.400	2.49926	2.99982	0.00021	1.49583	0.00004	0.24551	0.00000	0.00153	0.00000	0.00000	0.00834	0.0
0.300	2.49954	2.99992	0.00011	1.49678	0.00002	0.24651	0.00000	0.00103	0.00000	0.00000	0.00645	0.0
0.200	2.49980	3.00000	0.00004	1.49783	0.00001	0.24764	0.00000	0.00056	0.00000	0.00000	0.00434	0.0
0.100	2.50002	3.00004	0.00000	1.49901	0.00000	0.24888	0.00000	0.00016	0.00000	0.00000	0.00198	0.0
0.080	2.50006	3.00004	0.00000	1.49925	0.00000	0.24912	0.00000	0.00010	0.00000	0.00000	0.00152	0.0
0.060	2.50009	3.00005	0.00000	1.49949	0.00000	0.24936	0.00000	0.00006	0.00000	0.00000	0.00104	0.0
0.050	2.50011	3.00005	0.00000	1.49960	0.00000	0.24947	0.00000	0.00004	0.00000	0.00000	0.00081	0.0
0.040	2.50013	3.00005	0.00000	1.49972	0.00000	0.24958	0.00000	0.00002	0.00000	0.00000	0.00058	0.0
0.030	2.50014	3.00006	0.00000	1.49982	0.00000	0.24968	0.00000	0.00001	0.00000	0.00000	0.00038	0.0
0.020	2.50017	3.00007	0.00000	1.49991	0.00000	0.24975	0.00000	0.00000	0.00000	0.00000	0.00019	0.0
0.010	2.50020	3.00008	0.00000	1.49999	0.00000	0.24980	0.00000	0.00000	0.00000	0.00000	0.00004	0.0
0.008	2.50022	3.00009	0.00000	1.50000	0.00000	0.24980	0.00000	0.00000	0.00000	0.00000	0.00002	0.0
0.006	2.50023	3.00009	0.00000	1.50001	0.00000	0.24979	0.00000	0.00000	0.00000	0.00000	0.00001	0.0
0.005	2.50025	3.00010	0.00000	1.50001	0.00000	0.24978	0.00000	0.00000	0.00000	0.00000	0.00001	0.0
0.004	2.50026	3.00010	0.00000	1.50001	0.00000	0.24977	0.00000	0.00000	0.00000	0.00000	0.00001	0.0
0.003	2.50028	3.00011	0.00000	1.50002	0.00000	0.24975	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.002	2.50032	3.00013	0.00000	1.50002	0.00000	0.24973	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
300.000	2.48212	2.96745	0.03255	1.39366	0.00109	0.15244	0.00017	0.03303	0.00008	0.00000	0.21252	0.0
400.000	2.48048	2.96073	0.03928	1.37362	0.00111	0.13531	0.00034	0.03574	0.00010	0.00000	0.25242	0.0
500.000	2.47851	2.95245	0.04756	1.35514	0.00118	0.12065	0.00063	0.03864	0.00012	0.00000	0.28909	0.0

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



NG
RHO (G/CC) 1.591
E_0 (KCAL/MOLE) -89.02
D_{C-J}(M/SEC) 7650.
P_{C-J}(KBAR) 235.4
T_{C-J}(K) 3871.

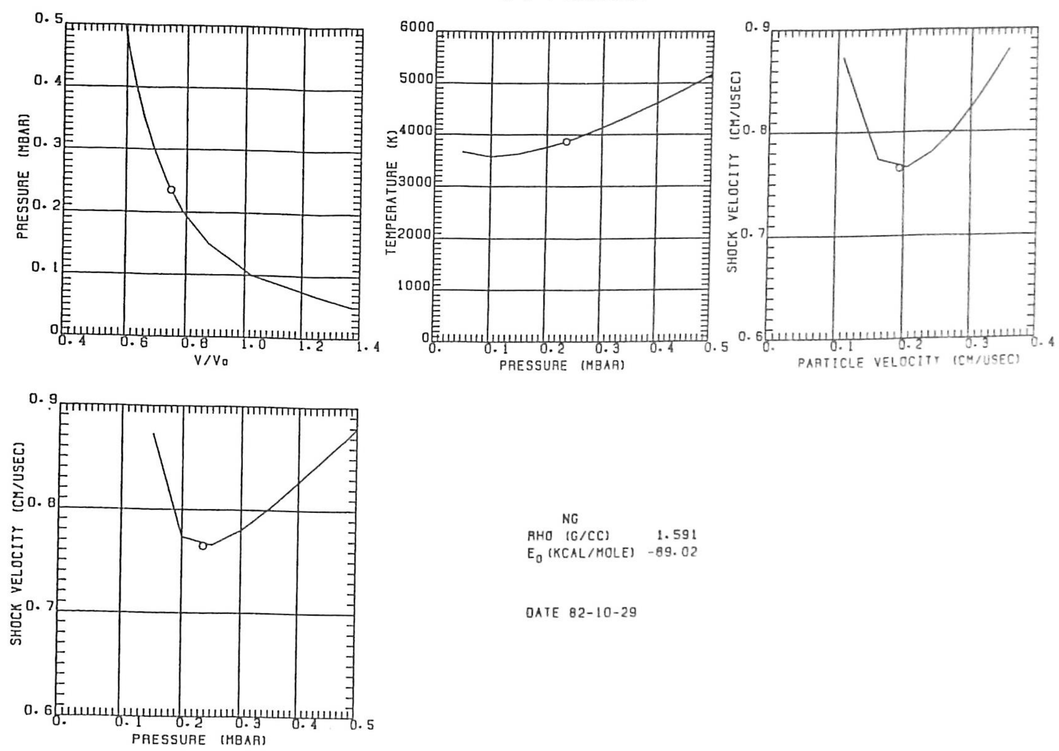
DATE 82-10-29

********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

NG RHO = 1.5910 G/CC, EO = -8.902300E+04 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3733	0.3844	0.3975	0.4136	0.4338	0.4602	0.4965	0.5508	0.6438	0.8616
TEMP (DEG K)	5169.2	4878.7	4614.2	4365.2	4133.6	3925.5	3750.5	3624.7	3576.6	3662.1
US (M/SEC)	8796.5	8533.4	8270.2	8020.9	7802.2	7660.2	7736.9	8729.5	0.0	0.0
UP (M/SEC)	3572.6	3314.5	3040.0	2742.7	2416.8	2051.3	1624.8	1080.0	0.0	0.0
H2O (MOLE)	2.4686	2.4700	2.4746	2.4782	2.4810	2.4829	2.4837	2.4827	2.4778	2.4594
CO2 (MOLE)	2.9163	2.9219	2.9404	2.9541	2.9640	2.9704	2.9733	2.9714	2.9587	2.9039
CO (MOLE)	0.0837	0.0781	0.0596	0.0459	0.0360	0.0296	0.0267	0.0287	0.0413	0.0961
N2 (MOLE)	1.3418	1.3484	1.3634	1.3778	1.3916	1.4045	1.4160	1.4252	1.4304	1.4277
H2 (MOLE)	0.0023	0.0022	0.0017	0.0014	0.0012	0.0011	0.0011	0.0014	0.0024	0.0071
O2 (MOLE)	0.1226	0.1265	0.1334	0.1419	0.1517	0.1621	0.1725	0.1824	0.1925	0.2129
NH3 (MOLE)	0.0011	0.0009	0.0005	0.0003	0.0002	0.0001	0.0001	0.0001	0.0000	0.0001
OH (MOLE)	0.0545	0.0527	0.0455	0.0397	0.0350	0.0316	0.0301	0.0316	0.0392	0.0661
H (MOLE)	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0006
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO (MOLE)	0.3153	0.3023	0.2727	0.2441	0.2166	0.1909	0.1679	0.1496	0.1391	0.1446
C(S) (MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

K-H-T HUGONIOT



NG
RHO (G/CC) 1.591
E_0 (KCAL/MOLE) -89.02

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

NITROMETHANE RHO = 1.1280 G/CC EO = -2.702900E+04 CAL/MOLE

LN P = -3.25354958 E+00 -2.45431232 E+00LN V 3.42279911 E-01LN V*2 -3.78454626 E-02LN V*3 1.46716135 E-03LN V*4

LN T = 7.83227825 E+00 -5.39120257 E-01LN V 1.65930450 E-01LN V*2 -2.76146233 E-02LN V*3 1.61017105 E-03LN V*4

LN E = -1.41156101 E+00 4.86076415 E-01LNP 7.41977096 E-02LN P*2 5.60604781 E-03LN P*3 1.57150964 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
300.000 (308.843)	0.4679	4294.9 (4230.6)	-1234.8	0.15166 (0.14977)	3.0423	0.0
200.000 (203.743)	0.5379	3770.8 (3778.9)	-757.3	0.13169 (0.13213)	2.9238	828.5
* 122.123 (123.131)	0.6418	3300.0 (3315.8)	-357.1	0.11494 (0.11595)	2.7807	1728.4
100.000 (99.825)	0.6927	3152.3 (3146.3)	-240.0	0.11004 (0.11065)	2.7213	2072.4
80.000 (79.164)	0.7551	2989.7 (2973.3)	-121.8	0.10510 (0.10541)	2.6557	2431.0
60.000 (58.916)	0.8454	2787.1 (2772.8)	13.3	0.09944 (0.09958)	2.5725	2857.9
50.000 (48.937)	0.9094	2665.2 (2657.2)	89.5	0.09625 (0.09634)	2.5204	3110.2
40.000 (39.061)	0.9956	2524.5 (2526.7)	173.7	0.09273 (0.09278)	2.4574	3401.6
30.000 (29.161)	1.1236	2361.5 (2372.4)	267.7	0.08880 (0.08878)	2.3761	3756.9
20.000 (19.584)	1.3339	2156.2 (2186.6)	380.2	0.08409 (0.08404)	2.2664	4203.9
10.000 (9.979)	1.8190	1881.5 (1926.4)	528.6	0.07788 (0.07782)	2.0841	4878.4
8.000 (8.037)	2.0209	1814.7 (1855.5)	566.5	0.07630 (0.07620)	2.0268	5076.3
6.000 (6.074)	2.3263	1752.9 (1771.5)	607.8	0.07457 (0.07432)	1.9537	5320.6
5.000 (5.084)	2.5509	1713.3 (1722.4)	633.5	0.07350 (0.07324)	1.9080	5469.6
4.000 (4.071)	2.8708	1669.5 (1665.5)	661.1	0.07234 (0.07201)	1.8518	5649.2
3.000 (3.055)	3.3626	1613.3 (1598.4)	695.9	0.07088 (0.07055)	1.7806	5872.3
2.000 (2.037)	4.2493	1536.3 (1514.8)	743.4	0.06890 (0.06871)	1.6838	6171.2
1.000 (1.009)	6.5859	1423.0 (1395.5)	811.0	0.06607 (0.06595)	1.5281	6653.6
0.800 (0.806)	7.6461	1387.5 (1362.9)	832.6	0.06517 (0.06514)	1.4822	6800.1
0.600 (0.602)	9.3430	1344.4 (1323.6)	858.3	0.06409 (0.06412)	1.4260	6985.4
0.500 (0.501)	10.6484	1317.4 (1300.3)	874.6	0.06341 (0.06350)	1.3926	7100.4
0.400 (0.400)	12.5567	1285.5 (1273.0)	893.8	0.06260 (0.06274)	1.3540	7239.3
0.300 (0.298)	15.6353	1245.4 (1239.4)	918.0	0.06159 (0.06179)	1.3084	7415.2
0.200 (0.198)	21.5468	1190.6 (1194.0)	951.3	0.06020 (0.06046)	1.2529	7657.3
0.100 (0.099)	38.2020	1102.9 (1117.6)	1005.0	0.05795 (0.05822)	1.1835	8056.6
0.080 (0.079)	46.2152	1077.4 (1092.4)	1020.2	0.05731 (0.05751)	1.1679	8182.3
0.060 (0.059)	59.0732	1044.1 (1059.6)	1040.8	0.05645 (0.05661)	1.1528	8340.4
0.050 (0.050)	69.0710	1023.5 (1038.5)	1053.5	0.05592 (0.05604)	1.1457	8439.0
0.040 (0.040)	83.6980	998.9 (1012.4)	1068.7	0.05529 (0.05535)	1.1397	8558.4
0.030 (0.030)	107.3957	968.7 (978.3)	1087.5	0.05450 (0.05448)	1.1358	8710.6
0.020 (0.020)	152.8211	927.9 (930.0)	1113.1	0.05343 (0.05330)	1.1367	8921.4
0.010 (0.010)	278.8467	859.5 (850.8)	1154.4	0.05170 (0.05146)	1.1517	9270.3
0.008 (0.008)	338.3469	838.0 (827.2)	1166.7	0.05118 (0.05093)	1.1592	9379.8
0.006 (0.006)	433.7449	810.2 (798.8)	1182.2	0.05054 (0.05031)	1.1699	9518.6
0.005 (0.005)	507.4543	792.6 (782.2)	1191.7	0.05014 (0.04995)	1.1771	9605.1
0.004 (0.004)	614.7161	771.2 (763.8)	1202.9	0.04967 (0.04956)	1.1862	9709.5
0.003 (0.003)	786.4604	743.7 (743.4)	1216.8	0.04909 (0.04915)	1.1978	9841.6
0.002 (0.002)	1111.1846	705.2 (722.3)	1235.5	0.04831 (0.04874)	1.2133	10022.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

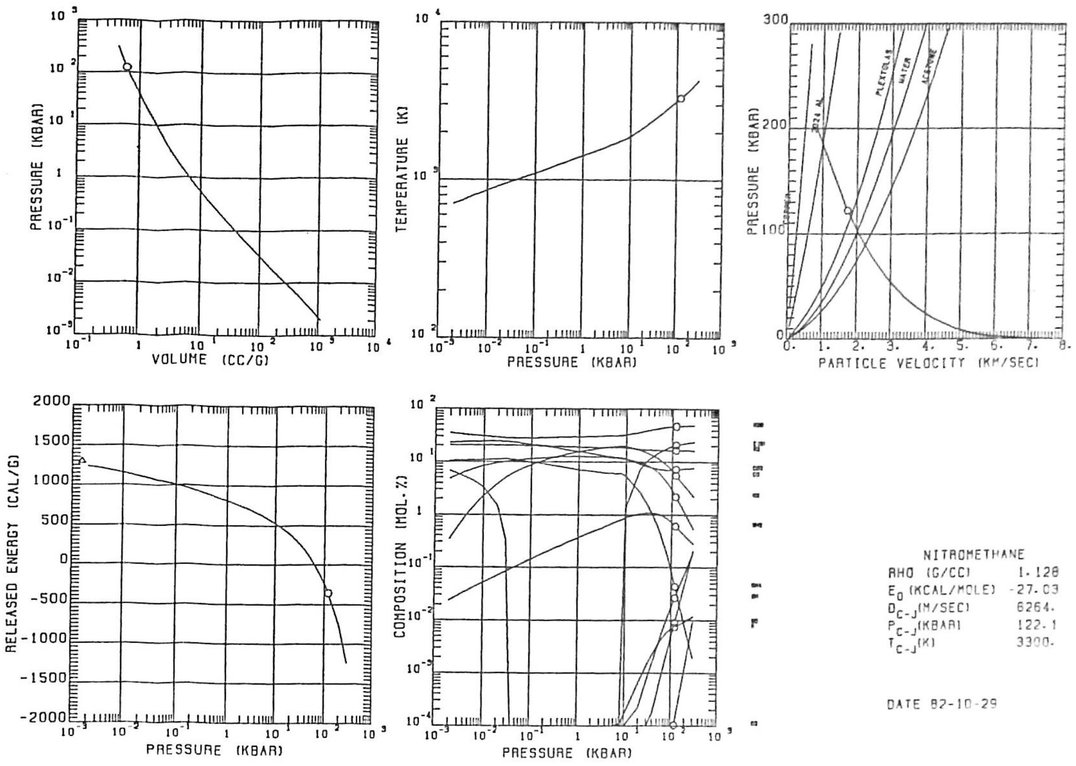
NITROMETHANE RHO = 1.1280 G/CC EO = -2.702900E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
122.123	1.40483	0.21498	0.16416	0.49088	0.06514	0.00000	0.01797	0.00079	0.00022	0.00128	0.00027	0.61958
100.000	1.37411	0.21165	0.20196	0.48922	0.08820	0.00000	0.02143	0.00052	0.00020	0.00260	0.00014	0.58379
80.000	1.33472	0.20983	0.24531	0.48750	0.11726	0.00000	0.02494	0.00031	0.00017	0.00518	0.00006	0.53968
60.000	1.27766	0.21097	0.30030	0.48575	0.15721	0.00000	0.02850	0.00015	0.00013	0.01112	0.00002	0.47761
50.000	1.23849	0.21387	0.33371	0.48498	0.18247	0.00000	0.03005	0.00009	0.00010	0.01693	0.00001	0.43549
40.000	1.18830	0.21979	0.37216	0.48443	0.21161	0.00000	0.03114	0.00005	0.00007	0.02666	0.00001	0.38140
30.000	1.12441	0.23066	0.41433	0.48446	0.24359	0.00000	0.03110	0.00002	0.00004	0.04266	0.00000	0.31235
20.000	1.02806	0.25299	0.46604	0.48529	0.27690	0.00000	0.02943	0.00001	0.00002	0.07544	0.00000	0.20551
10.000	0.87731	0.30245	0.51785	0.48821	0.30063	0.00000	0.02361	0.00000	0.00000	0.14332	0.00000	0.03636
8.000	0.84295	0.31722	0.52270	0.48922	0.30445	0.00000	0.02160	0.00000	0.00000	0.16010	0.00000	0.0
6.000	0.83396	0.32660	0.51293	0.49033	0.31612	0.00000	0.01933	0.00000	0.00000	0.16046	0.00000	0.0
5.000	0.82811	0.33391	0.50415	0.49101	0.32098	0.00000	0.01800	0.00000	0.00000	0.16196	0.00000	0.0
4.000	0.82129	0.34201	0.49481	0.49176	0.32756	0.00000	0.01651	0.00000	0.00000	0.16319	0.00000	0.0
3.000	0.81236	0.35417	0.47936	0.49263	0.33262	0.00000	0.01476	0.00000	0.00000	0.16644	0.00000	0.0
2.000	0.79966	0.37404	0.45238	0.49373	0.33435	0.00000	0.01258	0.00000	0.00000	0.17356	0.00000	0.0
1.000	0.77893	0.40677	0.40768	0.49521	0.33554	0.00000	0.00960	0.00000	0.00000	0.18556	0.00000	0.0
0.800	0.77213	0.41890	0.39021	0.49562	0.33281	0.00000	0.00879	0.00000	0.00000	0.19094	0.00000	0.0
0.600	0.76363	0.43407	0.36836	0.49609	0.32946	0.00000	0.00783	0.00000	0.00000	0.19759	0.00000	0.0
0.500	0.75819	0.44418	0.35354	0.49639	0.32635	0.00000	0.00726	0.00000	0.00000	0.20228	0.00000	0.0
0.400	0.75165	0.45648	0.33553	0.49671	0.32239	0.00000	0.00662	0.00000	0.00000	0.20801	0.00000	0.0
0.300	0.74325	0.47263	0.31161	0.49708	0.31636	0.00000	0.00586	0.00000	0.00000	0.21580	0.00000	0.0
0.200	0.73170	0.49573	0.27697	0.49757	0.30622	0.00000	0.00491	0.00000	0.00000	0.22736	0.00000	0.0
0.100	0.71340	0.53427	0.21814	0.49822	0.28606	0.00000	0.00359	0.00000	0.00000	0.24758	0.00000	0.0
0.080	0.70808	0.54531	0.20138	0.49839	0.28045	0.00000	0.00325	0.00000	0.00000	0.25330	0.00000	0.0
0.060	0.70169	0.56004	0.17833	0.49860	0.27077	0.00000	0.00284	0.00000	0.00000	0.26164	0.00000	0.0
0.050	0.69803	0.56898	0.16411	0.49872	0.26431	0.00000	0.00261	0.00000	0.00000	0.26688	0.00000	0.0
0.040	0.69392	0.57942	0.14733	0.49884	0.25611	0.00000	0.00235	0.00000	0.00000	0.27322	0.00000	0.00841
0.030	0.69658	0.58875	0.12602	0.49899	0.24673	0.00000	0.00207	0.00000	0.00000	0.27680	0.00000	0.03619
0.020	0.71622	0.59355	0.09679	0.49914	0.23427	0.00000	0.00173	0.00000	0.00000	0.27346	0.00000	0.07965
0.010	0.75364	0.59519	0.05610	0.49937	0.20635	0.00000	0.00128	0.00000	0.00000	0.26905	0.00000	0.09235
0.008	0.76647	0.59387	0.04592	0.49944	0.19612	0.00000	0.00115	0.00000	0.00000	0.26785	0.00000	0.10825
0.006	0.78406	0.59077	0.03453	0.49952	0.18153	0.00000	0.00101	0.00000	0.00000	0.26645	0.00000	0.11804
0.005	0.79579	0.58799	0.02837	0.49954	0.17166	0.00000	0.00093	0.00000	0.00000	0.26559	0.00000	0.12975
0.004	0.81059	0.58380	0.02195	0.49960	0.15920	0.00000	0.00083	0.00000	0.00000	0.26449	0.00000	0.14474
0.003	0.83069	0.57709	0.01528	0.49965	0.14246	0.00000	0.00072	0.00000	0.00000	0.26289	0.00000	0.16609
0.002	0.86089	0.56533	0.00861	0.49975	0.11832	0.00000	0.00059	0.00000	0.00000	0.25997	0.00000	0.16609
200.000	1.45068	0.22308	0.09921	0.49346	0.03019	0.00004	0.01157	0.00236	0.00028	0.00022	0.00150	0.67748
300.000	1.46822	0.22684	0.06556	0.49269	0.01599	0.00028	0.00841	0.00577	0.00036	0.00006	0.00620	0.70754

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



NITROMETHANE

RHO (G/CC)	1.128
E_0 (KCAL/MOLE)	-27.03
D_{C-J} (M/SEC)	6264.
P_{C-J} (KBAR)	122.1
T_{C-J} (K)	3300.

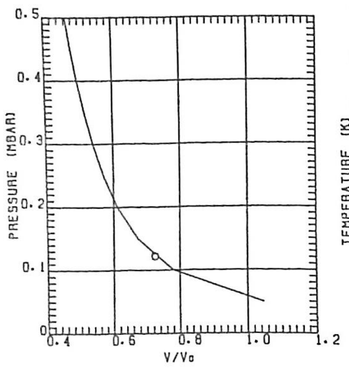
DATE 82-10-29

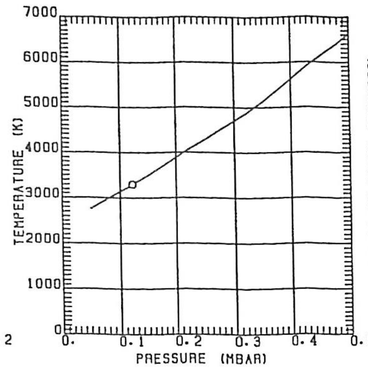
********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

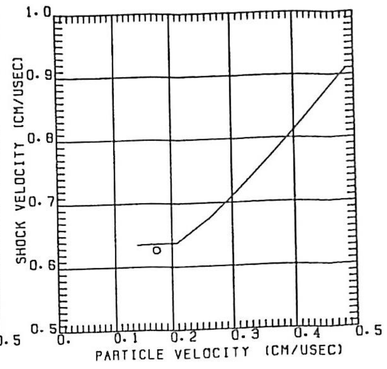
NITROMETHANE RHO = 1.1280 G/CC, EO = -2.702900E+04 CAL/MOLE

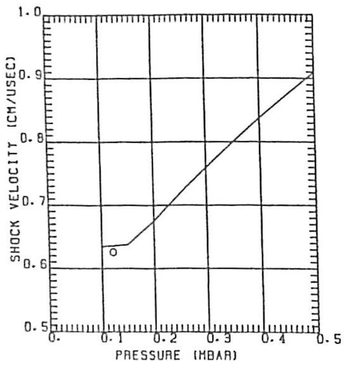
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.4112	0.4240	0.4388	0.4563	0.4778	0.5052	0.5421	0.5967	0.6917	0.9272
TEMP (DEG K)	6615.7	6109.3	5615.8	5137.1	4702.6	4289.0	3888.0	3504.9	3140.3	2757.7
US (M/SEC)	9092.3	8744.6	8379.3	7996.2	7595.6	7177.9	6755.6	6378.1	6351.8	0.0
UP (M/SEC)	4875.1	4562.1	4232.0	3880.4	3501.5	3087.7	2624.6	2084.9	1395.7	0.0
H2O (MOLE)	1.4384	1.4420	1.4440	1.4436	1.4460	1.4468	1.4417	1.4251	1.3764	1.1976
CO2 (MOLE)	0.2219	0.2187	0.2156	0.2126	0.2153	0.2184	0.2191	0.2173	0.2123	0.2057
CO (MOLE)	0.0903	0.0915	0.0942	0.0992	0.1019	0.1054	0.1151	0.1384	0.1983	0.3909
N2 (MOLE)	0.4830	0.4839	0.4846	0.4850	0.4882	0.4911	0.4924	0.4920	0.4894	0.4835
H2 (MOLE)	0.0238	0.0239	0.0245	0.0261	0.0275	0.0300	0.0359	0.0495	0.0865	0.2115
O2 (MOLE)	0.0007	0.0008	0.0009	0.0009	0.0005	0.0002	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0204	0.0178	0.0158	0.0147	0.0136	0.0130	0.0134	0.0155	0.0211	0.0331
OH (MOLE)	0.0124	0.0131	0.0139	0.0148	0.0106	0.0060	0.0030	0.0013	0.0005	0.0001
H (MOLE)	0.0009	0.0009	0.0010	0.0011	0.0009	0.0006	0.0004	0.0003	0.0002	0.0002
CH4 (MOLE)	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0007	0.0025	0.0206
NO (MOLE)	0.0136	0.0143	0.0150	0.0154	0.0099	0.0047	0.0019	0.0006	0.0001	0.0000
C(S) (MOLE)	0.6875	0.6896	0.6900	0.6881	0.6827	0.6760	0.6655	0.6437	0.5868	0.3828

K-H-T HUGONIOT









NITROMETHANE
RHO (G/CC) 1.128
E_0 (KCAL/MOLE) -27.03

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

NITROGLYCOL RHO = 1.4850 G/CC EO = -5.828500E+04 CAL/MOLE

LN P = -3.34593868 E+00 -2.33288193 E+00LN V 3.70387495 E-01LN V*2 -5.22211567 E-02LN V*3 2.65332661 E-03LN V*4

LN T = 8.13753128 E+00 -2.67909288 E-01LN V 6.16506077 E-02LN V*2 -1.39842853 E-02LN V*3 9.43416730 E-04LN V*4

LN E = -1.57103634 E+00 4.43381131 E-01LNP 6.82355762 E-02LN P*2 5.65110520 E-03LN P*3 1.72958287 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (503.434)	0.3793	5118.4 (4763.7)	-1477.1	0.16180 (0.15764)	3.2079	73.4
400.000 (403.176)	0.4068	4761.5 (4624.6)	-1130.5	0.14730 (0.14599)	3.1336	615.2
300.000 (301.906)	0.4468	4420.6 (4451.9)	-772.9	0.13234 (0.13326)	3.0369	1255.8
* 214.854 (215.760)	0.5001	4110.5 (4262.6)	-445.0	0.11862 (0.12111)	2.9249	1929.5
200.000 (200.144)	0.5132	4074.4 (4221.9)	-394.2	0.11649 (0.11880)	2.9000	2072.4
100.000 (98.272)	0.6628	3765.1 (3862.8)	2.6	0.09989 (0.10083)	2.6648	3292.8
80.000 (78.592)	0.7216	3678.5 (3759.4)	101.3	0.09576 (0.09636)	2.5916	3632.6
60.000 (59.091)	0.8072	3573.8 (3633.3)	213.0	0.09109 (0.09132)	2.4989	4040.3
50.000 (49.394)	0.8679	3510.9 (3557.3)	276.0	0.08845 (0.08849)	2.4410	4282.9
40.000 (39.706)	0.9504	3437.0 (3468.0)	346.1	0.08552 (0.08534)	2.3710	4565.2
30.000 (29.995)	1.0722	3345.3 (3358.2)	427.0	0.08213 (0.08174)	2.2820	4908.4
20.000 (20.195)	1.2814	3220.7 (3212.1)	526.4	0.07797 (0.07737)	2.1587	5359.3
10.000 (10.178)	1.7890	3013.2 (2980.7)	668.3	0.07204 (0.07137)	1.9529	6063.2
8.000 (8.134)	2.0105	2947.1 (2910.1)	708.3	0.07036 (0.06973)	1.8883	6275.7
6.000 (6.080)	2.3535	2861.6 (2821.8)	757.1	0.06832 (0.06777)	1.8070	6540.4
5.000 (5.053)	2.6113	2807.8 (2767.3)	786.3	0.06710 (0.06661)	1.7568	6703.0
4.000 (4.027)	2.9780	2742.0 (2702.0)	820.7	0.06566 (0.06526)	1.6973	6896.6
3.000 (3.007)	3.5512	2657.9 (2620.2)	862.7	0.06390 (0.06362)	1.6241	7137.8
2.000 (1.995)	4.6076	2540.1 (2508.4)	918.3	0.06158 (0.06145)	1.5290	7462.9
1.000 (0.993)	7.4360	2338.5 (2322.8)	1005.9	0.05791 (0.05804)	1.3916	7986.3
0.800 (0.794)	8.7542	2273.4 (2263.3)	1032.4	0.05680 (0.05699)	1.3548	8148.1
0.600 (0.595)	10.8682	2188.6 (2186.2)	1065.8	0.05540 (0.05567)	1.3131	8352.6
0.500 (0.496)	12.5042	2134.5 (2137.0)	1086.6	0.05454 (0.05485)	1.2902	8479.8
0.400 (0.397)	14.8913	2068.4 (2076.3)	1111.3	0.05350 (0.05385)	1.2659	8633.5
0.300 (0.298)	18.7283	1983.6 (1997.4)	1142.3	0.05221 (0.05259)	1.2404	8827.8
0.200 (0.199)	26.0137	1865.4 (1884.9)	1184.2	0.05045 (0.05085)	1.2153	9094.4
0.100 (0.100)	45.9663	1669.0 (1691.8)	1251.0	0.04766 (0.04798)	1.1975	9530.8
0.080 (0.080)	55.3365	1610.9 (1629.6)	1270.2	0.04685 (0.04709)	1.1972	9667.3
0.060 (0.060)	70.2208	1536.0 (1550.6)	1294.7	0.04583 (0.04597)	1.1996	9839.1
0.050 (0.050)	81.6395	1489.4 (1501.4)	1309.7	0.04520 (0.04528)	1.2024	9945.7
0.040 (0.040)	98.2052	1434.3 (1442.0)	1327.4	0.04446 (0.04446)	1.2069	10074.5
0.030 (0.030)	124.5693	1365.4 (1367.4)	1349.1	0.04355 (0.04344)	1.2137	10237.0
0.020 (0.020)	174.0074	1272.2 (1266.9)	1377.9	0.04235 (0.04210)	1.2236	10459.4
0.010 (0.010)	306.8931	1122.3 (1111.5)	1423.1	0.04046 (0.04011)	1.2352	10819.8
0.008 (0.008)	369.0791	1079.8 (1065.9)	1435.6	0.03993 (0.03957)	1.2360	10932.3
0.006 (0.006)	466.7910	1024.3 (1011.6)	1451.8	0.03926 (0.03895)	1.2338	11071.9
0.005 (0.005)	541.3835	990.1 (979.7)	1461.6	0.03885 (0.03861)	1.2303	11157.9
0.004 (0.004)	649.1343	949.7 (943.3)	1473.1	0.03837 (0.03825)	1.2234	11261.1
0.003 (0.003)	819.5991	899.3 (901.0)	1487.1	0.03778 (0.03790)	1.2096	11390.1
0.002 (0.002)	1136.7029	831.5 (850.4)	1505.7	0.03700 (0.03762)	1.1797	11564.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

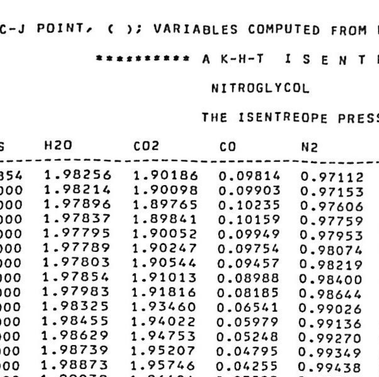
NITROGLYCOL RHO = 1.4850 G/CC EO = -5.828500E+04 CAL/MOLE

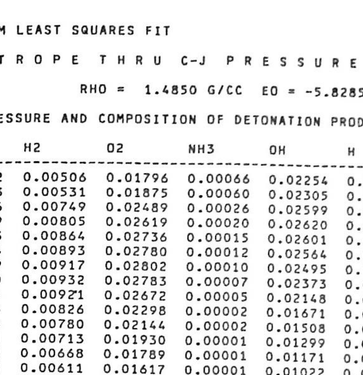
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

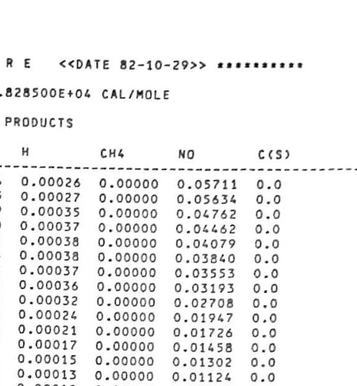
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
214.854	1.98256	1.90186	0.09814	0.97112	0.00506	0.01796	0.00066	0.02254	0.00026	0.00000	0.05711	0.0
200.000	1.98214	1.90098	0.09903	0.97153	0.00531	0.01875	0.00060	0.02305	0.00027	0.00000	0.05634	0.0
100.000	1.97896	1.89765	0.10235	0.97606	0.00749	0.02489	0.00026	0.02599	0.00035	0.00000	0.04762	0.0
80.000	1.97837	1.89841	0.10159	0.97759	0.00805	0.02619	0.00020	0.02620	0.00037	0.00000	0.04462	0.0
60.000	1.97795	1.90052	0.09949	0.97953	0.00864	0.02736	0.00015	0.02601	0.00038	0.00000	0.04079	0.0
50.000	1.97789	1.90247	0.09754	0.98074	0.00893	0.02780	0.00012	0.02564	0.00038	0.00000	0.03840	0.0
40.000	1.97803	1.90544	0.09457	0.98219	0.00917	0.02802	0.00010	0.02495	0.00037	0.00000	0.03553	0.0
30.000	1.97854	1.91013	0.08988	0.98400	0.00932	0.02783	0.00007	0.02373	0.00036	0.00000	0.03193	0.0
20.000	1.97983	1.91816	0.08185	0.98644	0.00921	0.02672	0.00005	0.02148	0.00032	0.00000	0.02708	0.0
10.000	1.98325	1.93460	0.06541	0.99026	0.00826	0.02298	0.00002	0.01671	0.00024	0.00000	0.01947	0.0
8.000	1.98455	1.94022	0.05979	0.99136	0.00780	0.02144	0.00002	0.01508	0.00021	0.00000	0.01726	0.0
6.000	1.98629	1.94753	0.05248	0.99270	0.00713	0.01930	0.00001	0.01299	0.00017	0.00000	0.01458	0.0
5.000	1.98739	1.95207	0.04795	0.99349	0.00668	0.01789	0.00001	0.01171	0.00015	0.00000	0.01302	0.0
4.000	1.98873	1.95746	0.04255	0.99438	0.00611	0.01617	0.00001	0.01022	0.00013	0.00000	0.01124	0.0
3.000	1.99038	1.96404	0.03598	0.99540	0.00538	0.01398	0.00000	0.00843	0.00010	0.00000	0.00919	0.0
2.000	1.99251	1.97243	0.02759	0.99663	0.00436	0.01104	0.00000	0.00622	0.00007	0.00000	0.00673	0.0
1.000	1.99555	1.98410	0.01592	0.99820	0.00280	0.00670	0.00000	0.00332	0.00003	0.00000	0.00361	0.0
0.800	1.99634	1.98707	0.01295	0.99857	0.00237	0.00554	0.00000	0.00262	0.00002	0.00000	0.00287	0.0
0.600	1.99723	1.99037	0.00965	0.99896	0.00186	0.00421	0.00000	0.00188	0.00001	0.00000	0.00208	0.0
0.500	1.99771	1.99215	0.00787	0.99917	0.00157	0.00348	0.00000	0.00149	0.00001	0.00000	0.00166	0.0
0.400	1.99822	1.99399	0.00603	0.99938	0.00126	0.00271	0.00000	0.00110	0.00001	0.00000	0.00125	0.0
0.300	1.99875	1.99587	0.00415	0.99958	0.00093	0.00190	0.00000	0.00072	0.00000	0.00000	0.00083	0.0
0.200	1.99929	1.99772	0.00231	0.99978	0.00057	0.00108	0.00000	0.00037	0.00000	0.00000	0.00044	0.0
0.100	1.99979	1.99932	0.00071	0.99994	0.00022	0.00032	0.00000	0.00009	0.00000	0.00000	0.00012	0.0
0.080	1.99987	1.99955	0.00048	0.99996	0.00016	0.00021	0.00000	0.00006	0.00000	0.00000	0.00008	0.0
0.060	1.99994	1.99975	0.00029	0.99998	0.00011	0.00010	0.00000	0.00003	0.00000	0.00000	0.00004	0.0
0.050	1.99998	1.99983	0.00021	0.99999	0.00008	0.00006	0.00000	0.00002	0.00000	0.00000	0.00002	0.0
0.040	2.00002	1.99992	0.00012	1.00000	0.00005	0.00001	0.00000	0.00001	0.00000	0.00000	0.00001	0.0
0.030	2.00002	1.99993	0.00010	1.00000	0.00005	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.020	2.00002	1.99995	0.00009	1.00000	0.00005	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.010	2.00001	1.99997	0.00006	1.00000	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.008	2.00001	1.99998	0.00005	1.00000	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.006	2.00001	1.99999	0.00004	1.00001	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.005	2.00001	2.00000	0.00004	1.00001	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.004	2.00001	2.00000	0.00003	1.00001	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.003	2.00001	2.00001	0.00002	1.00001	0.00006	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
0.002	2.00002	2.00002	0.00001	1.00001	0.00005	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
300.000	1.98105	1.88999	0.11001	0.96425	0.00479	0.01716	0.00122	0.02437	0.00028	0.00000	0.07027	0.0
400.000	1.97865	1.87631	0.12369	0.95613	0.00463	0.01652	0.00222	0.02647	0.00031	0.00000	0.08551	0.0
500.000	1.97728	1.87152	0.12848	0.95120	0.00430	0.01521	0.00333	0.02651	0.00031	0.00000	0.09427	0.0

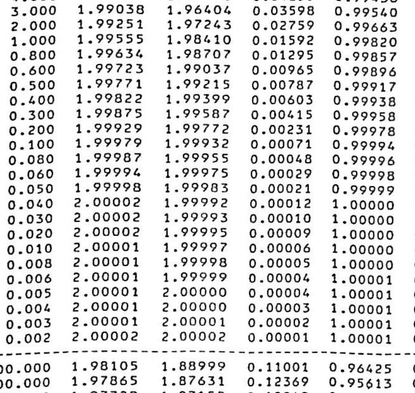
PRESS ;KBAR, PRODUCTS ;MOLES

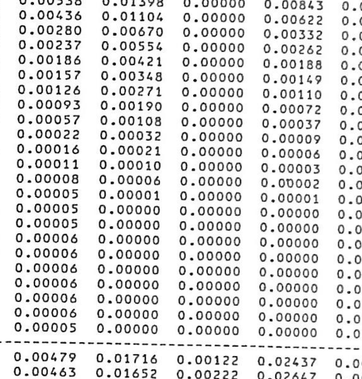
K-H-T ISENTROPE THRU C-J POINT











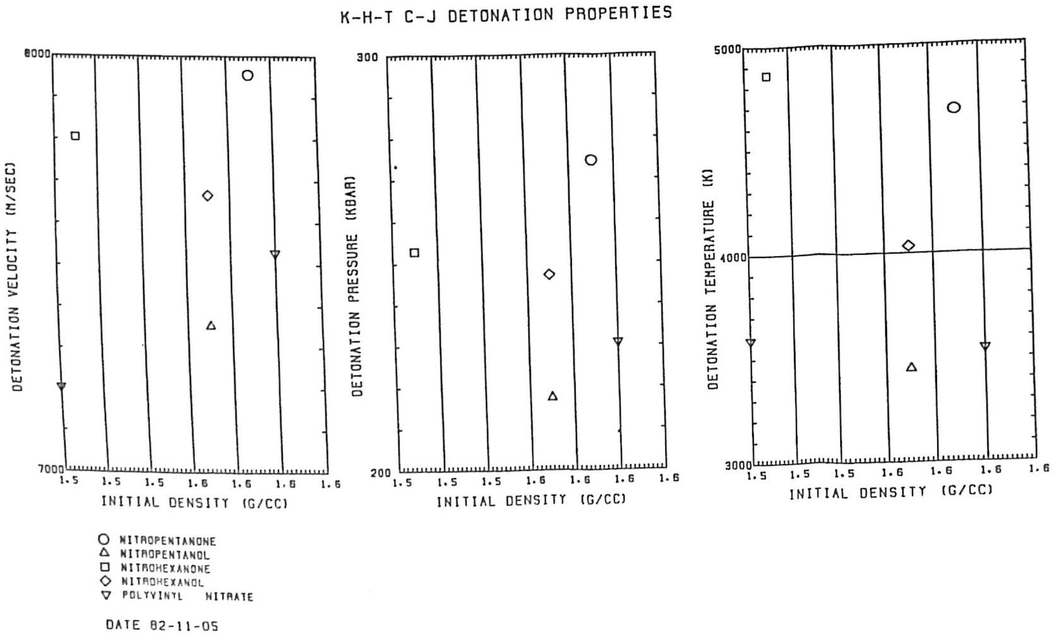
NITROGLYCOL
RHO (G/CC) 1.485
E_0 (KCAL/MOLE) -58.28
D_{C-J}(M/SEC) 7498.
P_{C-J}(KBAR) 214.9
T_{C-J}(K) 4111.

DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-05>> **********

EXPLOSIVES		NITROPENTANONE	#NITROPENTANOL E	#NITROHEXANONE	#NITROHEXANOL	#POLYVINYL NITRATE	#POLYVINYL NITRATE	#
RHO	(G/CC)	1.590	1.570	1.510	1.570	1.600	1.500	
EO	(KCAL/MOLE)	80.00	-180.00	150.00	-40.00	-26.59	-26.59	
MOL.WEIGHT	(G)	384.215	431.228	398.242	445.255	89.051	89.051	
C		9.0000	9.0000	10.0000	10.0000	2.0000	2.0000	
H		12.0000	13.0000	14.0000	15.0000	3.0000	3.0000	
N		4.0000	5.0000	4.0000	5.0000	1.0000	1.0000	
O		13.0000	15.0000	13.0000	15.0000	3.0000	3.0000	
DETN.VEL	(M/SEC)	7955.9	7353.5	7803.5	7666.4	7529.4	7203.5	
PARTICL.VEL	(")	2169.7	1883.0	2145.8	2052.8	1915.8	1850.7	
C-J PRESS	(KBAR)	274.5	217.4	252.8	247.1	230.8	200.0	
C-J VOLUME	(CC/G)	0.45741	0.47384	0.48015	0.46639	0.46598	0.49539	
C-J TEMP	(DEG K)	4682.4	3446.6	4864.0	4033.2	3542.4	3593.0	
C-J S	(CAL/DEG MOL)	62.70	58.06	63.56	60.51	59.05	59.14	
C-J ENERGY	(CAL/G)	562.59	423.72	550.23	503.60	438.51	409.31	
GAMMA		2.667	2.905	2.637	2.735	2.930	2.892	
C-J DETN.HEAT	(CAL)	1885.9	1354.4	1996.2	1630.1	1441.9	1427.9	
LAMDA		8.9748	9.2677	8.5117	8.8366	8.8761	8.8466	
VOLUM(K LITTRE/KG)		0.7699	0.7663	0.7878	0.7789	0.7691	0.7777	
TOTAL PRODCT	(MOLE)	17.0298	17.9936	19.0146	19.9992	3.9986	3.9969	
V GAS	(MOLES)	12.0917	13.5078	12.8241	14.1751	2.7994	2.8308	
V GAS	(CC/MOLE)	13.1923	13.9552	13.2641	13.2541	13.3410	14.0860	
V C(S)	(CC/G)	0.27360	0.29385	0.28401	0.28285	0.28806	0.30283	
H2O	(MOL %)	34.2176	35.8005	35.0974	36.8660	37.1630	36.9352	
CO2	(MOL %)	17.5478	22.3978	12.4745	16.9973	17.7427	17.1660	
CO	(MOL %)	6.3005	2.6890	7.5506	3.8817	2.2836	3.6946	
N2	(MOL %)	11.4801	13.8370	10.2074	12.3705	12.4404	12.4270	
H2	(MOL %)	0.5461	0.1932	1.0034	0.3660	0.2051	0.3784	
O2	(MOL %)	0.0270	0.0015	0.0228	0.0068	0.0019	0.0015	
NH3	(MOL %)	0.1906	0.0739	0.3108	0.1348	0.0808	0.1231	
OH	(MOL %)	0.3317	0.0352	0.4150	0.1222	0.0430	0.0508	
H	(MOL %)	0.0210	0.0014	0.0411	0.0066	0.0018	0.0033	
CH4	(MOL %)	0.0033	0.0006	0.0094	0.0015	0.0006	0.0018	
NO	(MOL %)	0.3375	0.0397	0.3108	0.1252	0.0469	0.0421	
C(S)	(MOL %)	28.9971	24.9303	32.5568	29.1216	29.9904	29.1761	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES		PYX	#SORGUYL	#PATO	#TPT	#T-TACOT	#Z-TACOT	#PADP	#
RHO	(G/CC)	1.770	2.010	1.936	1.670	1.810	1.850	1.860	
EO	(KCAL/MOLE)	20.90	10.00	36.30	118.10	112.40	110.50	147.70	
MOL.WEIGHT	(G)	621.309	322.108	281.166	714.351	388.214	388.214	647.307	
C		17.0000	4.0000	8.0000	21.0000	12.0000	12.0000	17.0000	
H		7.0000	2.0000	5.0000	6.0000	4.0000	4.0000	5.0000	
N		11.0000	8.0000	6.0000	12.0000	8.0000	8.0000	13.0000	
O		16.0000	10.0000	6.0000	18.0000	8.0000	8.0000	16.0000	
DETN.VEL	(M/SEC)	7405.3	8913.0	7955.1	7078.6	7406.7	7519.7	7838.8	
PARTICL.VEL	(")	1865.4	2104.5	2012.1	1776.1	1880.5	1956.8	1982.2	
C-J PRESS	(KBAR)	244.5	377.0	309.9	210.0	252.1	272.2	289.0	
C-J VOLUME	(CC/G)	0.42266	0.38004	0.38588	0.44856	0.41221	0.39988	0.40168	
C-J TEMP	(DEG K)	3598.5	3426.4	3187.3	3919.2	3652.6	3650.9	3953.5	
C-J S	(CAL/DEG MOL)	63.25	53.29	61.10	65.69	66.00	66.00	63.57	
C-J ENERGY	(CAL/G)	415.83	529.27	483.82	376.97	422.61	457.62	469.54	
GAMMA		2.970	3.235	2.954	2.985	2.939	2.843	2.955	
C-J DETN.HEAT	(CAL)	1283.5	1353.6	1223.8	1345.2	1294.8	1293.1	1405.5	
LAMDA		10.5779	11.1315	9.5264	10.7836	10.2972	10.3127	10.8985	
VOLUM(K LITTRE/KG)		0.6118	0.7218	0.6327	0.5926	0.5768	0.5748	0.6072	
TOTAL PRODCT	(MOLE)	26.0062	9.5028	13.5010	30.0131	18.0042	18.0057	26.0278	
V GAS	(MOLES)	15.5375	9.5028	7.2712	17.3020	9.1534	9.1207	16.0652	
V GAS	(CC/MOLE)	14.6185	12.8819	12.3270	15.8765	14.2436	13.8607	14.2177	
V SOL C(S)	(CC/G)	0.28208	0.22546	0.25213	0.29957	0.27893	0.27007	0.26413	
H2O	(MOL %)	13.3484	10.4915	18.4764	9.7997	11.0057	11.0250	9.5145	
CO2	(MOL %)	22.9582	42.0666	12.8085	22.3969	15.8354	15.9960	24.6668	
CO	(MOL %)	2.1559	0.0265	0.3033	5.2207	1.6562	1.3036	2.3712	
N2	(MOL %)	21.0987	40.2428	22.1957	19.9204	22.1664	22.1626	24.8670	
H2	(MOL %)	0.0549	0.0002	0.0142	0.1150	0.0492	0.0363	0.0376	
O2	(MOL %)	0.0025	3.4087	0.0009	0.0038	0.0022	0.0026	0.0085	
NH3	(MOL %)	0.0277	0.0000	0.0150	0.0369	0.0276	0.0231	0.0203	
OH	(MOL %)	0.0256	0.0636	0.0079	0.0471	0.0234	0.0224	0.0440	
H	(MOL %)	0.0007	0.0000	0.0001	0.0027	0.0007	0.0006	0.0011	
CH4	(MOL %)	0.0001	0.0000	0.0000	0.0003	0.0001	0.0000	0.0000	
NO	(MOL %)	0.0725	3.7002	0.0349	0.1049	0.0737	0.0819	0.1925	
C(S)	(MOL %)	40.2548	0.0	46.1432	42.3518	49.1595	49.3458	38.2769	

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES		ABH	#BIS-HNAB	#HNAB	#TPB	#PENCO	#DODECA	#BTX	#
RHO	(G/CC)	1.780	1.810	1.775	1.670	1.860	1.810	1.740	
EO	(KCAL/MOLE)	116.30	191.10	67.90	-62.10	-26.60	50.60	70.90	
MOL.WEIGHT	(G)	874.395	902.408	452.212	711.388	407.212	846.381	420.213	
C		24.0000	24.0000	12.0000	24.0000	13.0000	24.0000	12.0000	
H		6.0000	6.0000	4.0000	9.0000	5.0000	6.0000	4.0000	
N		14.0000	16.0000	8.0000	9.0000	5.0000	12.0000	8.0000	
O		24.0000	24.0000	12.0000	18.0000	11.0000	24.0000	10.0000	
DETN.VEL	(M/SEC)	7518.2	7703.5	7582.7	6618.0	7363.6	7495.0	7295.7	
PARTICL.VEL	(")	1994.4	1977.3	1971.4	1646.6	1900.9	1904.2	1877.8	
C-J PRESS	(KBAR)	266.8	275.7	265.3	182.0	260.4	258.3	238.4	
C-J VOLUME	(CC/G)	0.41270	0.41068	0.41691	0.44982	0.39885	0.41212	0.42679	
C-J TEMP	(DEG K)	4146.0	4190.0	4031.9	3280.6	3489.2	3999.8	3766.1	
C-J S	(CAL/DEG MOL)	65.32	64.64	64.08	67.40	66.97	65.84	64.66	
C-J ENERGY	(CAL/G)	475.35	467.20	464.46	323.99	431.82	433.33	421.40	
GAMMA		2.768	2.896	2.846	3.019	2.874	2.936	2.885	
C-J DETN.HEAT	(CAL)	1418.4	1456.3	1409.1	1145.9	1256.4	1394.4	1309.8	
LAMDA		11.1993	11.1362	10.8720	10.4204	10.6609	11.2972	10.6079	
VOLUM(K LITTRE/KG)		0.5941	0.6025	0.6129	0.5560	0.5632	0.5823	0.5974	
TOTAL PRODCT	(MOLE)	34.0465	35.0554	18.0188	32.9943	18.0032	33.0320	18.0067	
V GAS	(MOLES)	21.2328	22.2248	11.3281	16.1664	9.3747	20.1434	10.2611	
V GAS	(CC/MOLE)	15.0054	14.7970	14.6938	15.9162	14.2896	15.1824	14.8887	
V SOL C(S)	(CC/G)	0.27461	0.27088	0.27475	0.31019	0.27459	0.27769	0.28560	
H2O	(MOL %)	8.6866	8.4346	10.9581	13.4961	13.8156	8.9741	10.9754	
CO2	(MOL %)	28.6330	27.8074	25.9071	19.2919	22.9301	29.8123	20.7975	
CO	(MOL %)	4.2231	4.0544	3.5576	2.4453	1.3515	3.8261	2.8291	
N2	(MOL %)	20.4355	22.6783	22.0892	13.6142	13.8519	18.0722	22.1510	
H2	(MOL %)	0.0576	0.0543	0.0663	0.0884	0.0337	0.0520	0.0680	
O2	(MOL %)	0.0121	0.0137	0.0089	0.0004	0.0021	0.0086	0.0032	
NH3	(MOL %)	0.0223	0.0223	0.0295	0.0318	0.0185	0.0198	0.0306	
OH	(MOL %)	0.0652	0.0686	0.0591	0.0115	0.0183	0.0506	0.0336	
H	(MOL %)	0.0021	0.0022	0.0019	0.0006	0.0004	0.0015	0.0012	
CH4	(MOL %)	0.0001	0.0001	0.0001	0.0003	0.0000	0.0001	0.0001	
NO	(MOL %)	0.2268	0.2631	0.1901	0.0174	0.0504	0.1643	0.0952	
C(S)	(MOL %)	37.6358	36.6012	37.1320	51.0024	47.9276	39.0186	43.0151	

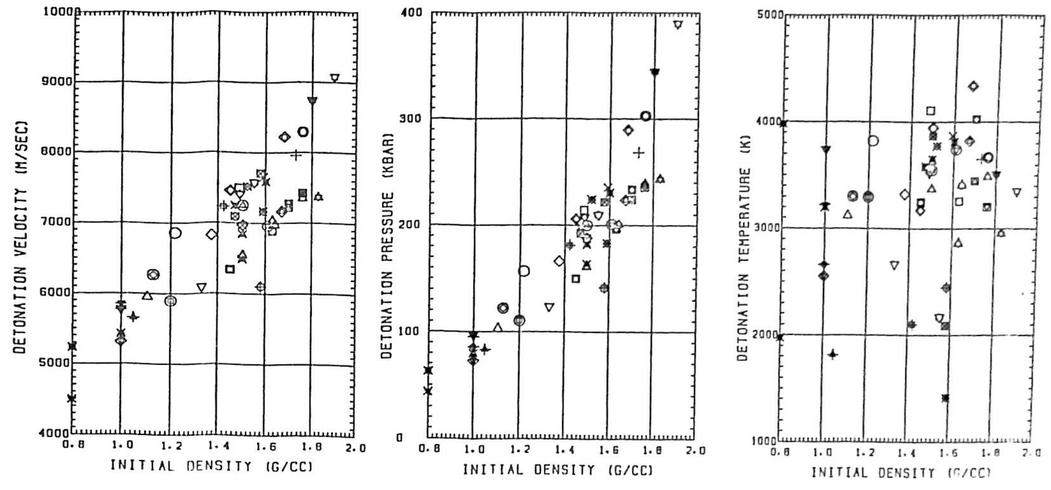
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES	NONA	#HNBP	#TNN	#ONT	#DIPAM	#HNS	#ATNI	#
RHO (G/CC)	1.780	1.740	1.800	1.800	1.790	1.740	1.835	
EO (KCAL/MOLE)	27.40	14.60	12.30	19.70	-6.80	13.77	-3.43	
MOL.WEIGHT (G)	635.290	424.198	308.165	590.292	454.228	450.237	220.102	
C	18.0000	12.0000	10.0000	18.0000	12.0000	14.0000	3.0000	
H	5.0000	4.0000	4.0000	6.0000	6.0000	6.0000	4.0000	
N	9.0000	6.0000	4.0000	8.0000	8.0000	6.0000	6.0000	
O	18.0000	12.0000	8.0000	16.0000	12.0000	12.0000	6.0000	
DETN.VEL (M/SEC)	7410.7	7323.0	7256.2	7335.3	7531.8	7181.3	8557.2	
PARTICL.VEL(")	1947.7	1914.1	1866.7	1863.1	1874.7	1849.0	2061.5	
C-J PRESS (KBAR)	256.9	243.9	243.8	246.0	252.8	231.0	323.7	
C-J VOLUME (CC/G)	0.41414	0.42449	0.41264	0.41445	0.41961	0.42674	0.41368	
C-J TEMP (DEG K)	3998.2	3958.8	3637.3	3761.5	3507.8	3706.9	3341.7	
C-J S(CAL/DEG MOL)	65.76	65.44	67.84	66.79	62.13	66.77	53.10	
C-J ENERGY (CAL/G)	453.34	437.83	416.40	414.79	420.00	408.55	507.87	
GAMMA	2.805	2.826	2.887	2.937	3.018	2.884	3.151	
C-J DETN.HEAT(CAL)	1380.5	1375.6	1308.4	1334.9	1281.2	1326.5	1356.4	
LAMDA	11.1876	10.9637	10.4421	10.8620	10.4096	10.4125	9.9249	
VOLUM(K LITTRE/KG)	0.5869	0.5974	0.5673	0.5740	0.6282	0.5862	0.7810	
TOTAL PRODCT(MOLE)	25.0233	17.0124	14.0025	25.0101	19.0033	20.0034	8.0029	
V GAS (MOLES)	15.2394	10.3582	7.1462	13.8489	11.6643	10.7873	7.0266	
V GAS (CC/MOLE)	15.1187	15.1934	14.5383	14.9347	14.2394	14.8489	12.5459	
V SOL C(S) (CC/G)	0.27830	0.28396	0.28257	0.28214	0.27801	0.28869	0.24701	
H2O (MOL %)	9.8697	11.6005	14.1635	11.8800	15.6853	14.8329	24.9271	
CO2 (MOL %)	28.9987	27.3075	20.4245	24.6189	22.8448	21.1327	24.6420	
CO (MOL %)	3.8351	4.1153	2.0265	2.7250	1.6825	2.7828	0.6450	
N2 (MOL %)	17.8913	17.5498	14.2379	15.9363	21.0036	14.9444	37.4287	
H2 (MOL %)	0.0590	0.0809	0.0617	0.0590	0.0486	0.0897	0.0213	
O2 (MOL %)	0.0083	0.0067	0.0025	0.0039	0.0021	0.0027	0.0029	
NH3 (MOL %)	0.0229	0.0307	0.0291	0.0254	0.0275	0.0376	0.0224	
OH (MOL %)	0.0531	0.0547	0.0274	0.0346	0.0221	0.0348	0.0180	
H (MOL %)	0.0017	0.0020	0.0008	0.0011	0.0005	0.0013	0.0002	
CH4 (MOL %)	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0000	
NO (MOL %)	0.1610	0.1380	0.0614	0.0890	0.0632	0.0686	0.0931	
C(S) (MOL %)	39.0991	39.1138	48.9647	44.6269	38.6196	46.0725	12.1994	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-21>> **********

EXPLOSIVES	EDNA	#DNPA	#
RHO (G/CC)	1.710	1.477	
EO (KCAL/MOLE)	-24.71	-103.22	
MOL.WEIGHT (G)	150.094	258.151	
C	2.0000	6.0000	
H	6.0000	6.0000	
N	4.0000	6.0000	
O	4.0000	6.0000	
DETN.VEL (M/SEC)	8407.3	6271.5	
PARTICL.VEL(")	2013.4	1526.8	
C-J PRESS (KBAR)	289.5	141.4	
C-J VOLUME (CC/G)	0.44475	0.51222	
C-J TEMP (DEG K)	2891.3	2326.6	
C-J S(CAL/DEG MOL)	50.78	53.99	
C-J ENERGY (CAL/G)	484.40	278.56	
GAMMA	3.176	3.108	
C-J DETN.HEAT(CAL)	1301.5	813.6	
LAMDA	8.1633	9.1507	
VOLUM(K LITTRE/KG)	0.8975	0.7135	
TOTAL PRODCT(MOLE)	6.9983	11.9962	
V GAS (MOLES)	5.5065	7.5290	
V GAS (CC/MOLE)	11.2784	15.2366	
V SOL C(S) (CC/G)	0.25950	0.32646	
H2O (MOL %)	42.7838	24.9062	
CO2 (MOL %)	7.0933	12.3313	
CO (MOL %)	0.1675	0.4464	
N2 (MOL %)	28.5546	24.9917	
H2 (MOL %)	0.0309	0.0532	
O2 (MOL %)	0.0002	0.0000	
NH3 (MOL %)	0.0333	0.0321	
OH (MOL %)	0.0051	0.0003	
H (MOL %)	0.0001	0.0000	
CH4 (MOL %)	0.0000	0.0001	
NO (MOL %)	0.0139	0.0004	
C(S) (MOL %)	21.3174	37.2382	

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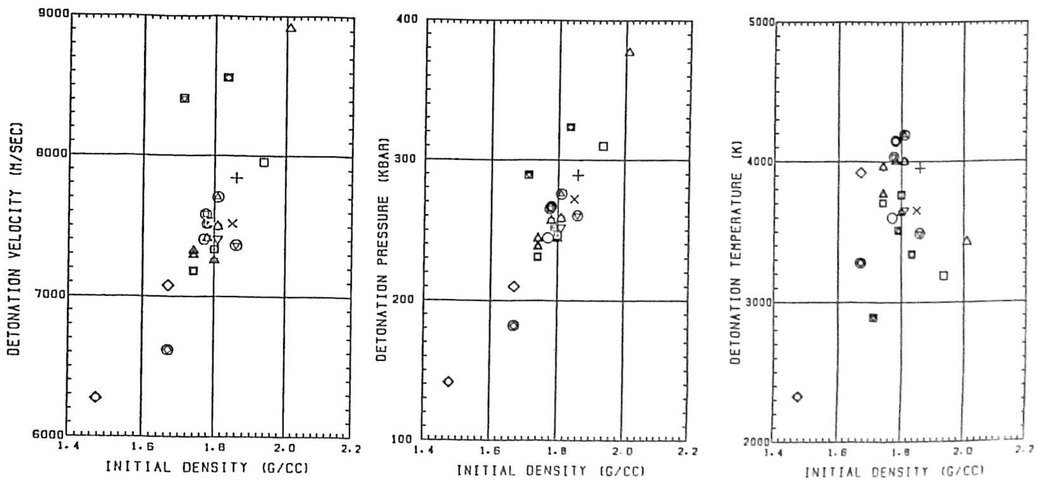
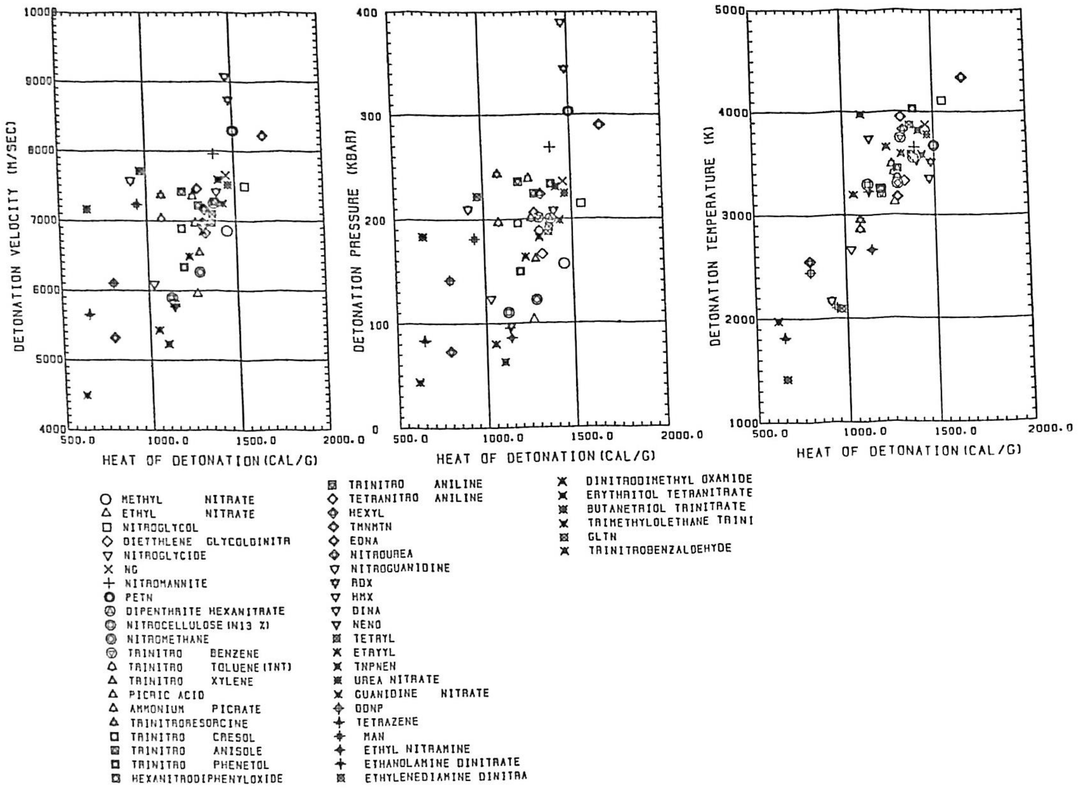
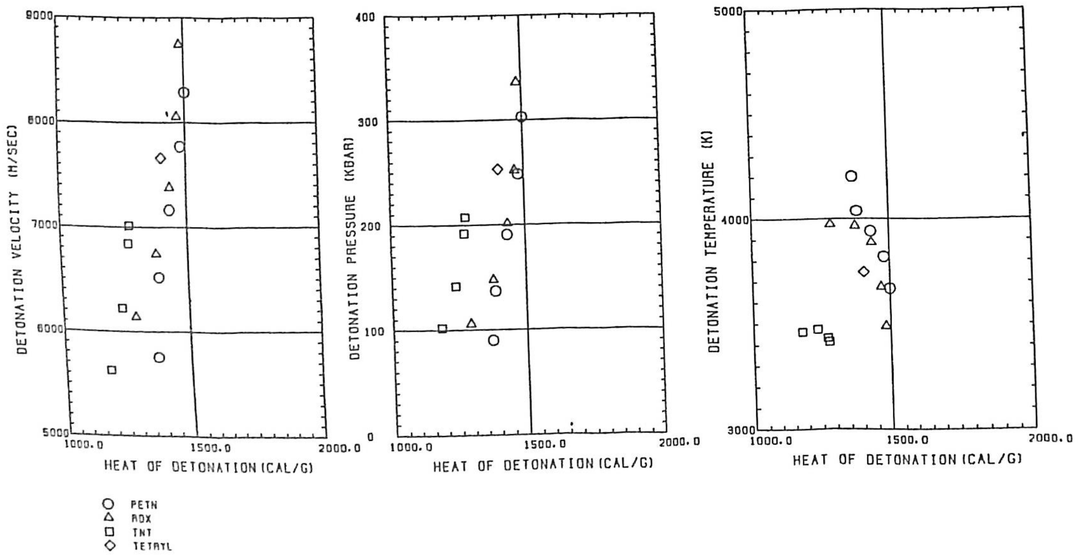
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES







EXPLOSIVES	RDX	#TNT	#TNT	#HMX	#RDX64/TNT36 COMP.B	#RDX64/TNT36 COMP.B	#RDX60/TNT40/# WAX0.5
RHO (G/CC)	1.767	1.637	1.530	1.736	1.713	1.566	1.730
EO (KCAL/MOLE)	16.90	-14.19	-14.19	17.89	2.62	2.62	1.82
MOL.WEIGHT (G)	222.118	227.134	227.134	296.157	100.000	100.000	100.500
C	3.0000	7.0000	7.0000	4.0000	1.9739	1.9739	2.0786
H	6.0000	5.0000	5.0000	8.0000	2.5213	2.5213	2.5743
N	6.0000	3.0000	3.0000	8.0000	2.2043	2.2043	2.1491
O	6.0000	6.0000	6.0000	8.0000	2.6798	2.6798	2.6774
DETN.VEL (M/SEC)	8628.3	6959.9	6624.1	8501.3	7991.2	7505.9	7985.2
PARTICL.VEL(")	2103.0	1776.2	1702.6	2107.1	2022.3	1925.3	2009.1
C-J PRESS (KBAR)	320.6	202.4	172.6	311.0	276.8	226.3	277.5
C-J VOLUME (CC/G)	0.42800	0.45497	0.48561	0.43326	0.43604	0.47478	0.43260
C-J TEMP (DEG K)	3520.9	3420.7	3450.5	3534.8	3551.2	3657.5	3498.9
C-J S(CAL/DEG MOL)	53.59	64.54	64.43	53.68	57.22	57.64	57.55
C-J ENERGY (CAL/G)	528.50	377.03	346.40	530.59	488.73	442.96	482.39
GAMMA	3.103	2.918	2.891	3.034	2.952	2.899	2.974
C-J DETN.HEAT(CAL)	1480.8	1274.0	1260.1	1464.1	1406.9	1392.7	1395.4
LAMDA	9.1421	9.3948	9.3509	9.1402	9.2205	9.1877	9.1699
VOLUM(K LITTRE/KG)	0.8302	0.6330	0.6416	0.8308	0.7587	0.7672	0.7504
TOTAL PRODCT(MOLE)	9.0024	10.9958	10.9921	12.0025	4.3367	4.3343	4.4402
V GAS (MOLES)	7.5378	5.8768	5.9562	10.0575	3.1013	3.1360	3.0824
V GAS (CC/MOLE)	12.0308	14.4371	15.3111	12.1701	12.7795	13.8056	12.6914
V SOL C(S) (CC/G)	0.24901	0.30084	0.31583	0.25310	0.26765	0.29066	0.26712
H2O (MOL %)	33.1796	22.4745	22.3010	33.1626	28.8742	28.6531	28.8142
CO2 (MOL %)	16.2614	14.9350	14.3680	16.2166	15.7709	15.1557	15.1470
CO (MOL %)	0.7935	2.1713	3.4986	0.9052	1.2577	2.7370	1.0869
N2 (MOL %)	33.2431	13.5965	13.5876	33.2435	25.3439	25.3330	24.1378
H2 (MOL %)	0.0533	0.1545	0.2849	0.0628	0.0870	0.2306	0.0771
O2 (MOL %)	0.0035	0.0008	0.0006	0.0033	0.0025	0.0020	0.0021
NH3 (MOL %)	0.0497	0.0630	0.0941	0.0554	0.0604	0.1166	0.0545
OH (MOL %)	0.0330	0.0219	0.0248	0.0348	0.0340	0.0474	0.0293
H (MOL %)	0.0006	0.0011	0.0020	0.0007	0.0009	0.0025	0.0007
CH4 (MOL %)	0.0000	0.0005	0.0016	0.0001	0.0001	0.0007	0.0001
NO (MOL %)	0.1128	0.0271	0.0231	0.1104	0.0811	0.0741	0.0705
C(S) (MOL %)	16.2695	46.5539	45.8138	16.2046	28.4874	27.6472	30.5799

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********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-22>> **********

EXPLOSIVES	RDX60/TNT40/# WAX0.5	#RDX/77/TNT23 /WAX 0.5	#RDX/77/TNT23 /WAX 0.5	#HMX76/TNT23 OCTOL	#HMX80/TNT20 OCTOL	#PETN50/TNT50 PENTOLITE	#HMX 75/HN 25#
RHO (G/CC)	1.655	1.743	1.566	1.809	1.800	1.650	1.860
EO (KCAL/MOLE)	1.82	4.17	4.17	3.13	3.33	-23.24	-10.99
MOL.WEIGHT (G)	100.500	100.500	100.500	100.000	100.500	100.000	100.000
C	2.0786	1.7843	1.7843	1.7609	1.7324	2.3317	1.0130
H	2.5743	2.6593	2.6593	2.5828	2.6743	2.3659	3.3409
N	2.1491	2.3838	2.3838	2.3741	2.4252	1.2930	2.8149
O	2.6774	2.6875	2.6875	2.6871	2.6893	3.2187	2.8149
DETN.VEL (M/SEC)	7741.6	8240.3	7650.9	8449.4	8456.4	7464.2	9128.7
PARTICL.VEL(")	2009.0	2061.3	1924.9	2100.5	2104.2	1908.4	2196.6
C-J PRESS (KBAR)	257.4	296.1	230.6	321.1	320.3	235.0	373.0
C-J VOLUME (CC/G)	0.44743	0.43021	0.47791	0.41537	0.41732	0.45110	0.40826
C-J TEMP (DEG K)	3583.0	3514.3	3651.7	3443.7	3433.9	3606.9	2974.6
C-J S(CAL/DEG MOL)	57.91	55.85	56.47	55.44	55.17	60.21	49.75
C-J ENERGY (CAL/G)	482.30	507.75	442.79	527.28	529.10	435.24	576.62
GAMMA	2.854	2.998	2.975	3.022	3.019	2.911	3.156
C-J DETN.HEAT(CAL)	1390.0	1429.3	1413.6	1424.8	1425.9	1381.3	1391.3
LAMDA	9.1580	9.1316	9.0986	9.2021	9.1313	9.6830	8.7627
VOLUM(K LITTRE/KG)	0.7534	0.7843	0.7937	0.7806	0.7887	0.7112	0.8936
TOTAL PRODCT(MOLE)	4.4395	4.3062	4.3032	4.2403	4.2829	4.1610	4.0914
V GAS (MOLES)	3.0948	3.2220	3.2605	3.1905	3.2398	2.9069	3.6526
V GAS (CC/MOLE)	13.0880	12.3711	13.6222	12.0366	11.9832	14.0344	10.8523
V SOL C(S) (CC/G)	0.27629	0.25929	0.28863	0.24852	0.24880	0.28640	0.22532
H2O (MOL %)	28.7349	30.7142	30.4469	30.3485	31.1100	28.1676	40.7983
CO2 (MOL %)	14.9262	15.3147	14.6435	16.1334	15.4734	23.1737	13.9207
CO (MOL %)	1.6051	0.9439	2.5904	0.6377	0.6209	2.7257	0.1129
N2 (MOL %)	24.1288	27.6081	27.5957	27.9324	28.2509	15.4738	34.3741
H2 (MOL %)	0.1240	0.0669	0.2361	0.0390	0.0405	0.1453	0.0080
O2 (MOL %)	0.0022	0.0027	0.0020	0.0028	0.0026	0.0027	0.0010
NH3 (MOL %)	0.0760	0.0533	0.1257	0.0365	0.0381	0.0626	0.0129
OH (MOL %)	0.0373	0.0313	0.0484	0.0249	0.0245	0.0434	0.0065
H (MOL %)	0.0013	0.0007	0.0025	0.0004	0.0004	0.0016	0.0000
CH4 (MOL %)	0.0002	0.0001	0.0007	0.0000	0.0000	0.0004	0.0000
NO (MOL %)	0.0744	0.0869	0.0777	0.0872	0.0845	0.0650	0.0405
C(S) (MOL %)	30.2897	25.1774	24.2303	24.7572	24.3543	30.1383	10.7252

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C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
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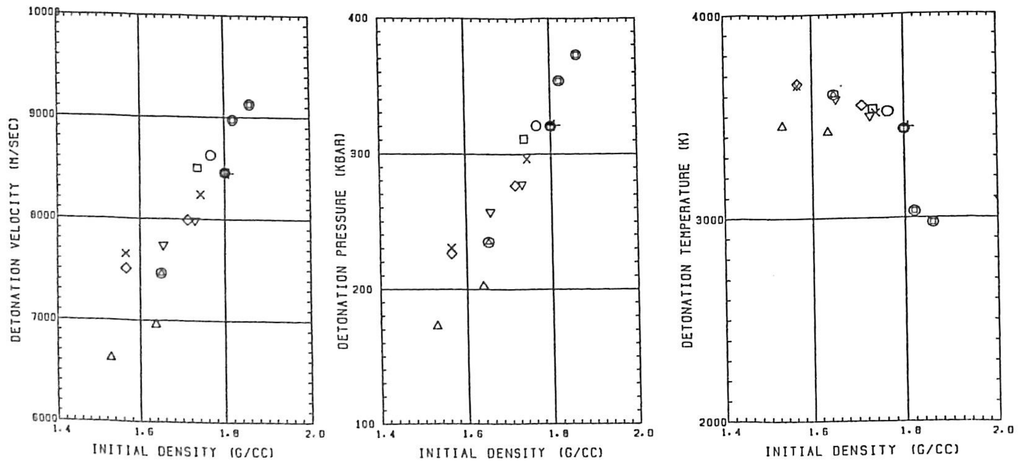
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-22>> **********

EXPLOSIVES		HMX 75/HN 25#
RHO	(G/CC)	1.820
EO	(KCAL/MOLE)	-10.99
MOL.WEIGHT	(G)	100.000
C		1.0130
H		3.3409
N		2.8149
O		2.8149
DETN.VEL	(M/SEC)	8974.7
PARTICL.VEL(")		2165.5
C-J PRESS	(KBAR)	353.7
C-J VOLUME	(CC/G)	0.41687
C-J TEMP	(DEG K)	3030.4
C-J S	(CAL/DEG MOL)	50.07
C-J ENERGY	(CAL/G)	560.40
GAMMA		3.144
C-J DETN.HEAT	(CAL)	1390.8
LAMDA		8.7620
VOLUM	(K LITTRE/KG)	0.8939
TOTAL PRODCT	(MOLE)	4.0913
V GAS	(MOLES)	3.6537
V GAS	(CC/MOLE)	11.0739
V SOL C(S)	(CC/G)	0.23341
H2O	(MOL %)	40.7867
CO2	(MOL %)	13.8998
CO	(MOL %)	0.1647
N2	(MOL %)	34.3716
H2	(MOL %)	0.0126
O2	(MOL %)	0.0010
NH3	(MOL %)	0.0178
OH	(MOL %)	0.0082
H	(MOL %)	0.0001
CH4	(MOL %)	0.0000
NO	(MOL %)	0.0425
C(S)	(MOL %)	10.6951

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

RDX64/TNT36 COMP.B RHO = 1.7130 G/CC EO = 2.620364E+03 CAL/MOLE

LN P = -3.54897976 E+00 -2.42832565 E+00LN V 3.21728766 E-01LN V*2 -3.08067054 E-02LN V*3 8.18673521 E-04LN V*4

LN T = 7.71725750 E+00 -4.65585709 E-01LN V 1.34495676 E-01LN V*2 -2.13062614 E-02LN V*3 1.17406435 E-03LN V*4

LN E = -1.60146904 E+00 4.68846500 E-01LNP 7.39561915 E-02LN P*2 5.71165606 E-03LN P*3 1.62889148 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (654.133)	0.3306	4725.1 (4572.9)	-1593.1	0.16666 (0.16163)	3.2581	176.7
500.000 (519.623)	0.3551	4332.2 (4309.2)	-1240.2	0.15189 (0.15065)	3.1973	678.2
400.000 (404.128)	0.3844	3983.5 (4043.4)	-906.0	0.13791 (0.13900)	3.1308	1225.2
300.000 (298.140)	0.4242	3635.6 (3749.9)	-570.3	0.12386 (0.12639)	3.0501	1856.8
* 276.834 (274.260)	0.4360	3551.2 (3674.3)	-488.8	0.12045 (0.12328)	3.0280	2022.3
200.000 (193.591)	0.4901	3364.2 (3380.5)	-261.1	0.11092 (0.11223)	2.9355	2680.9
100.000 (95.134)	0.6294	2932.0 (2875.1)	120.0	0.09498 (0.09498)	2.7464	3839.2
80.000 (76.146)	0.6831	2795.9 (2739.2)	216.0	0.09096 (0.09079)	2.6872	4158.3
60.000 (57.326)	0.7604	2625.1 (2579.5)	325.6	0.08638 (0.08611)	2.6116	4539.0
50.000 (47.969)	0.8146	2522.5 (2486.4)	386.9	0.08381 (0.08351)	2.5642	4764.0
40.000 (38.618)	0.8873	2403.5 (2380.0)	454.5	0.08099 (0.08067)	2.5066	5024.5
30.000 (28.954)	0.9971	2264.3 (2249.8)	529.7	0.07784 (0.07748)	2.4302	5349.7
20.000 (19.705)	1.1723	2086.8 (2093.5)	619.8	0.07407 (0.07371)	2.3284	5750.7
10.000 (10.189)	1.5735	1842.6 (1866.7)	739.1	0.06907 (0.06879)	2.1553	6361.8
8.000 (8.220)	1.7406	1778.6 (1802.6)	769.9	0.06779 (0.06751)	2.0995	6543.0
6.000 (6.218)	1.9927	1703.8 (1725.8)	806.1	0.06627 (0.06603)	2.0275	6767.2
5.000 (5.202)	2.1783	1660.6 (1680.2)	827.3	0.06539 (0.06518)	1.9818	6904.4
4.000 (4.173)	2.4384	1611.4 (1627.4)	851.5	0.06437 (0.06421)	1.9259	7067.8
3.000 (3.131)	2.8388	1553.4 (1564.1)	880.5	0.06316 (0.06307)	1.8538	7271.5
2.000 (2.073)	3.5686	1482.0 (1483.0)	916.2	0.06167 (0.06162)	1.7526	7548.0
1.000 (1.020)	5.4596	1375.3 (1366.5)	972.1	0.05933 (0.05943)	1.5864	7987.1
0.800 (0.811)	6.3229	1344.7 (1334.1)	988.5	0.05864 (0.05878)	1.5355	8121.2
0.600 (0.604)	7.6971	1306.9 (1295.3)	1009.0	0.05778 (0.05796)	1.4722	8289.6
0.500 (0.500)	8.7572	1283.8 (1272.3)	1021.8	0.05725 (0.05745)	1.4338	8394.1
0.400 (0.398)	10.3053	1256.4 (1245.6)	1037.0	0.05661 (0.05683)	1.3887	8519.9
0.300 (0.296)	12.8096	1222.0 (1213.1)	1056.2	0.05581 (0.05604)	1.3341	8679.2
0.200 (0.195)	17.6439	1175.0 (1170.0)	1082.8	0.05470 (0.05494)	1.2654	8898.4
0.100 (0.097)	31.3728	1098.0 (1100.7)	1126.8	0.05286 (0.05306)	1.1745	9258.8
0.080 (0.078)	37.9642	1074.2 (1078.6)	1140.2	0.05229 (0.05245)	1.1531	9371.3
0.060 (0.059)	48.6429	1044.0 (1050.1)	1157.3	0.05158 (0.05168)	1.1314	9513.8
0.050 (0.049)	56.9606	1025.1 (1031.8)	1167.9	0.05113 (0.05120)	1.1211	9602.7
0.040 (0.039)	69.1596	1002.4 (1009.2)	1180.5	0.05061 (0.05061)	1.1121	9710.4
0.030 (0.030)	88.8766	973.5 (979.6)	1196.4	0.04994 (0.04987)	1.1060	9847.4
0.020 (0.020)	126.6279	933.5 (937.2)	1217.9	0.04904 (0.04887)	1.1077	10037.4
0.010 (0.010)	231.6952	866.2 (864.4)	1252.4	0.04760 (0.04732)	1.1362	10355.0
0.008 (0.008)	281.3813	844.9 (841.5)	1262.7	0.04717 (0.04688)	1.1515	10455.7
0.006 (0.006)	361.1306	817.4 (812.7)	1275.6	0.04663 (0.04638)	1.1754	10583.8
0.005 (0.005)	422.7903	799.8 (795.2)	1283.6	0.04629 (0.04610)	1.1927	10664.1
0.004 (0.004)	512.5537	778.5 (774.5)	1293.0	0.04590 (0.04580)	1.2160	10761.3
0.003 (0.003)	656.3450	750.8 (749.7)	1304.7	0.04541 (0.04550)	1.2494	10884.5
0.002 (0.002)	928.2427	711.8 (718.7)	1320.3	0.04476 (0.04527)	1.3020	11053.8

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

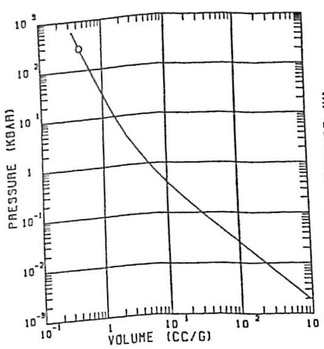
RDX64/TNT36 COMP.B RHO = 1.7130 G/CC EO = 2.620364E+03 CAL/MOLE

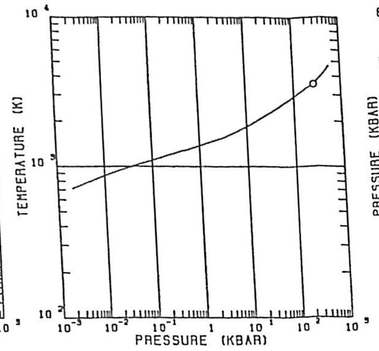
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

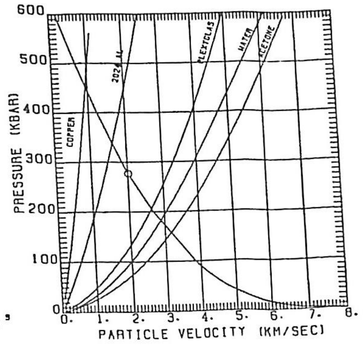
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
276.834	1.25218	0.68395	0.05450	1.09908	0.00377	0.00011	0.00262	0.00147	0.00004	0.00001	0.00352	1.23543
200.000	1.24426	0.66457	0.10389	1.09923	0.00916	0.00003	0.00441	0.00102	0.00006	0.00003	0.00142	1.20539
100.000	1.20583	0.60103	0.27143	1.09695	0.03812	0.00000	0.01024	0.00030	0.00007	0.00057	0.00016	1.10085
80.000	1.18550	0.57941	0.33520	1.09588	0.05384	0.00000	0.01247	0.00019	0.00006	0.00124	0.00007	1.05803
60.000	1.15321	0.55506	0.41635	1.09449	0.07844	0.00000	0.01529	0.00009	0.00005	0.00299	0.00003	0.99949
50.000	1.12937	0.54265	0.46504	1.09368	0.09599	0.00000	0.01693	0.00006	0.00004	0.00492	0.00001	0.96127
40.000	1.09689	0.53127	0.52032	1.09282	0.11872	0.00000	0.01866	0.00003	0.00003	0.00851	0.00001	0.91378
30.000	1.05206	0.52348	0.58076	1.09209	0.14782	0.00000	0.02011	0.00001	0.00002	0.01529	0.00000	0.85435
20.000	0.97960	0.52415	0.65191	1.09158	0.18635	0.00000	0.02114	0.00000	0.00001	0.03149	0.00000	0.76633
10.000	0.85505	0.55243	0.71991	1.09242	0.23120	0.00000	0.01947	0.00000	0.00000	0.07260	0.00000	0.62894
8.000	0.81804	0.56558	0.73062	1.09296	0.24024	0.00000	0.01839	0.00000	0.00000	0.08740	0.00000	0.59030
6.000	0.77495	0.58448	0.73592	1.09374	0.24849	0.00000	0.01683	0.00000	0.00000	0.10598	0.00000	0.54752
5.000	0.75063	0.59714	0.73491	1.09424	0.25217	0.00000	0.01582	0.00000	0.00000	0.11706	0.00000	0.52480
4.000	0.72416	0.61304	0.72958	1.09486	0.25545	0.00000	0.01459	0.00000	0.00000	0.12957	0.00000	0.50171
3.000	0.69521	0.63389	0.71684	1.09561	0.25818	0.00000	0.01309	0.00000	0.00000	0.14381	0.00000	0.47935
2.000	0.66201	0.66152	0.69478	1.09656	0.26142	0.00000	0.01119	0.00000	0.00000	0.16021	0.00000	0.45738
1.000	0.62748	0.71001	0.63234	1.09789	0.26247	0.00000	0.00854	0.00000	0.00000	0.17895	0.00000	0.45259
0.800	0.62072	0.72510	0.60892	1.09824	0.26246	0.00000	0.00783	0.00000	0.00000	0.18286	0.00000	0.45702
0.600	0.61489	0.74426	0.57645	1.09866	0.26220	0.00000	0.00699	0.00000	0.00000	0.18653	0.00000	0.46666
0.500	0.61280	0.75624	0.55457	1.09890	0.26186	0.00000	0.00651	0.00000	0.00000	0.18811	0.00000	0.47498
0.400	0.61175	0.77064	0.52682	1.09917	0.26137	0.00000	0.00596	0.00000	0.00000	0.18929	0.00000	0.48715
0.300	0.61272	0.78879	0.48956	1.09950	0.26048	0.00000	0.00532	0.00000	0.00000	0.18974	0.00000	0.50580
0.200	0.61806	0.81346	0.43488	1.09990	0.25860	0.00000	0.00451	0.00000	0.00000	0.18861	0.00000	0.53693
0.100	0.63549	0.85240	0.33959	1.10047	0.25281	0.00000	0.00338	0.00000	0.00000	0.18364	0.00000	0.59825
0.080	0.64246	0.86357	0.31027	1.10062	0.25036	0.00000	0.00308	0.00000	0.00000	0.18161	0.00000	0.61845
0.060	0.65240	0.87712	0.27324	1.10080	0.24633	0.00000	0.00272	0.00000	0.00000	0.17892	0.00000	0.64461
0.050	0.65922	0.88515	0.25036	1.10090	0.24320	0.00000	0.00251	0.00000	0.00000	0.17723	0.00000	0.66115
0.040	0.66784	0.89416	0.22373	1.10102	0.23900	0.00000	0.00228	0.00000	0.00000	0.17520	0.00000	0.68080
0.030	0.67962	0.90453	0.19121	1.10115	0.23265	0.00000	0.00201	0.00000	0.00000	0.17268	0.00000	0.70546
0.020	0.69753	0.91655	0.14927	1.10132	0.22170	0.00000	0.00169	0.00000	0.00000	0.16945	0.00000	0.73862
0.010	0.73235	0.92906	0.08943	1.10154	0.19689	0.00000	0.00123	0.00000	0.00000	0.16479	0.00000	0.79060
0.008	0.74451	0.93072	0.07397	1.10161	0.18758	0.00000	0.00111	0.00000	0.00000	0.16345	0.00000	0.80574
0.006	0.76140	0.93106	0.05639	1.10168	0.17414	0.00000	0.00097	0.00000	0.00000	0.16183	0.00000	0.82460
0.005	0.77274	0.93024	0.04671	1.10172	0.16494	0.00000	0.00089	0.00000	0.00000	0.16082	0.00000	0.83611
0.004	0.78720	0.92813	0.03647	1.10176	0.15317	0.00000	0.00080	0.00000	0.00000	0.15955	0.00000	0.84973
0.003	0.80692	0.92367	0.02568	1.10182	0.13719	0.00000	0.00069	0.00000	0.00000	0.15776	0.00000	0.86677
0.002	0.83672	0.91431	0.01462	1.10189	0.11373	0.00000	0.00056	0.00000	0.00000	0.15469	0.00000	0.89026
300.000	1.25297	0.68575	0.04852	1.09858	0.00317	0.00016	0.00240	0.00174	0.00004	0.00000	0.00473	1.23961
400.000	1.25426	0.68689	0.03417	1.09464	0.00185	0.00068	0.00196	0.00317	0.00004	0.00000	0.01306	1.25282
500.000	1.25382	0.68049	0.02866	1.08739	0.00136	0.00184	0.00194	0.00506	0.00005	0.00000	0.02758	1.26472
600.000	1.25156	0.66837	0.03101	1.07770	0.00136	0.00332	0.00261	0.00755	0.00007	0.00000	0.04629	1.27450

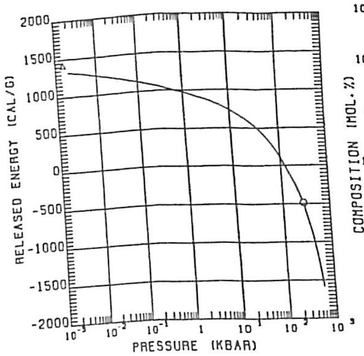
PRESS ;KBAR, PRODUCTS ;MOLES

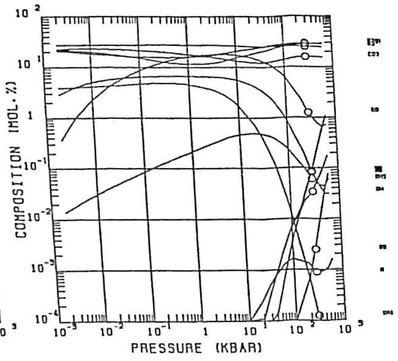
K-H-T ISENTROPE THRU C-J POINT











RDX64/TNT36 COMP.B

RHO (G/CC)	1.713
E_0 (KCAL/MOLE)	2.62
D_{C-J}(M/SEC)	7991.
P_{C-J}(KBAR)	276.8
T_{C-J}(K)	3551.

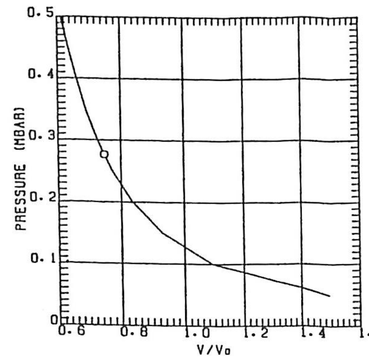
DATE 82-10-22

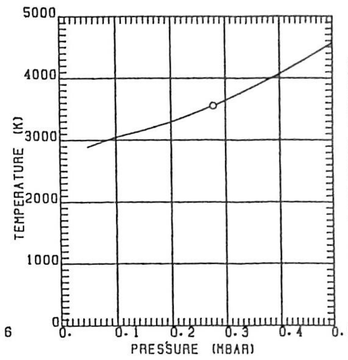
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

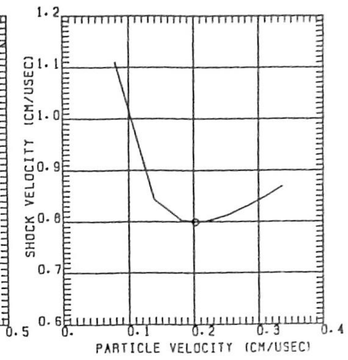
RDX64/TNT36 COMP.B RHO = 1.7130 G/CC, EO = 2.620364E+03 CAL/MOLE

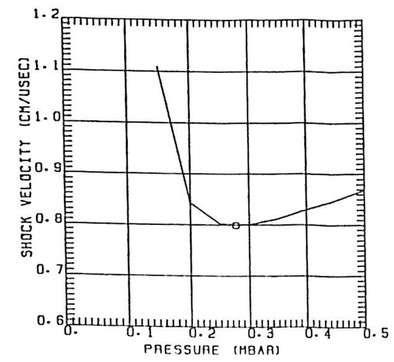
PRESSURE (KBAR)		500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3579	0.3709	0.3857	0.4031	0.4243	0.4513	0.4879	0.5422	0.6369	0.8716
TEMP	(DEG K)	4566.2	4312.4	4072.3	3847.1	3639.4	3453.2	3292.6	3159.9	3045.1	2889.7
US	(M/SEC)	8685.3	8488.3	8296.8	8126.1	8007.2	8019.7	8430.0	11095.2	0.0	0.0
UP	(M/SEC)	3360.7	3094.8	2814.4	2514.3	2187.2	1819.8	1385.0	789.2	0.0	0.0
H2O	(MOLE)	1.2509	1.2524	1.2532	1.2535	1.2529	1.2510	1.2463	1.2338	1.1936	1.0110
CO2	(MOLE)	0.6703	0.6782	0.6835	0.6860	0.6855	0.6812	0.6701	0.6438	0.5788	0.4187
CO	(MOLE)	0.0399	0.0387	0.0393	0.0423	0.0489	0.0626	0.0911	0.1572	0.3280	0.8310
N2	(MOLE)	1.0829	1.0890	1.0936	1.0967	1.0986	1.0995	1.0996	1.0987	1.0960	1.0886
H2	(MOLE)	0.0020	0.0020	0.0022	0.0025	0.0032	0.0046	0.0079	0.0169	0.0471	0.1855
O2	(MOLE)	0.0026	0.0015	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.0027	0.0024	0.0022	0.0022	0.0024	0.0029	0.0039	0.0063	0.0121	0.0270
OH	(MOLE)	0.0074	0.0054	0.0038	0.0026	0.0018	0.0012	0.0008	0.0006	0.0004	0.0003
H	(MOLE)	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0003
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0008	0.0117
NO	(MOLE)	0.0359	0.0239	0.0149	0.0087	0.0048	0.0025	0.0012	0.0006	0.0002	0.0001
C(S)	(MOLE)	1.2637	1.2570	1.2511	1.2456	1.2394	1.2301	1.2126	1.1728	1.0664	0.7124

K-H-T HUGONIOT









RDX64/TNT36 COMP.B

RHO (G/CC)	1.713
E_0 (KCAL/MOLE)	2.62

DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

RDX60/TNT40/WAX0.5 RHO = 1.7300 G/CC EO = 1.816507E+03 CAL/MOLE

LN P = -3.57076454 E+00 -2.42574692 E+00LN V 3.22304010 E-01LN V*2 -3.09692435 E-02LN V*3 8.29899451 E-04LN V*4

LN T = 7.70725346 E+00 -4.58382308 E-01LN V 1.32323325 E-01LN V*2 -2.10247077 E-02LN V*3 1.16376788 E-03LN V*4

LN E = -1.60802364 E+00 4.64697540 E-01LNP 7.36580491 E-02LN P*2 5.70640713 E-03LN P*3 1.63132689 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (658.506)	0.3276	4678.8 (4512.8)	-1583.7	0.16626 (0.16091)	3.2655	168.9
500.000 (520.364)	0.3523	4278.7 (4250.2)	-1228.4	0.15140 (0.15008)	3.2031	672.7
400.000 (403.617)	0.3817	3927.3 (3988.7)	-894.3	0.13742 (0.13859)	3.1357	1219.8
300.000 (297.361)	0.4213	3580.3 (3701.7)	-560.2	0.12344 (0.12614)	3.0545	1850.0
* 277.548 (274.270)	0.4327	3498.9 (3630.4)	-481.7	0.12016 (0.12317)	3.0330	2009.1
200.000 (192.986)	0.4867	3319.2 (3341.2)	-256.6	0.11074 (0.11216)	2.9393	2670.2
100.000 (94.966)	0.6246	2904.3 (2848.6)	116.8	0.09511 (0.09512)	2.7501	3820.0
80.000 (76.069)	0.6776	2772.1 (2716.1)	211.3	0.09116 (0.09098)	2.6909	4136.3
60.000 (57.309)	0.7540	2606.2 (2559.9)	319.0	0.08665 (0.08636)	2.6153	4514.1
50.000 (47.975)	0.8075	2506.0 (2468.9)	379.4	0.08413 (0.08380)	2.5678	4737.5
40.000 (38.641)	0.8793	2389.5 (2364.8)	446.0	0.08134 (0.08099)	2.5102	4996.1
30.000 (28.936)	0.9885	2252.8 (2236.3)	520.1	0.07824 (0.07783)	2.4332	5320.9
20.000 (19.712)	1.1614	2078.0 (2083.0)	609.2	0.07451 (0.07412)	2.3314	5718.8
10.000 (10.197)	1.5580	1836.9 (1859.8)	727.1	0.06958 (0.06926)	2.1579	6326.5
8.000 (8.229)	1.7231	1773.3 (1796.7)	757.8	0.06829 (0.06800)	2.1020	6506.5
6.000 (6.225)	1.9724	1699.3 (1720.9)	793.6	0.06679 (0.06654)	2.0297	6729.5
5.000 (5.207)	2.1559	1656.4 (1675.9)	814.6	0.06592 (0.06570)	1.9839	6866.1
4.000 (4.177)	2.4132	1607.7 (1623.7)	838.6	0.06491 (0.06475)	1.9277	7028.7
3.000 (3.133)	2.8092	1550.2 (1561.1)	867.3	0.06371 (0.06363)	1.8554	7231.4
2.000 (2.074)	3.5313	1479.5 (1480.7)	902.6	0.06224 (0.06220)	1.7537	7506.6
1.000 (1.020)	5.4028	1373.7 (1365.2)	957.9	0.05992 (0.06004)	1.5868	7943.7
0.800 (0.811)	6.2575	1343.2 (1333.0)	974.2	0.05924 (0.05939)	1.5356	8077.1
0.600 (0.604)	7.6181	1305.7 (1294.4)	994.5	0.05839 (0.05858)	1.4721	8244.8
0.500 (0.500)	8.6681	1282.8 (1271.6)	1007.2	0.05786 (0.05808)	1.4335	8348.8
0.400 (0.398)	10.2016	1255.5 (1245.0)	1022.2	0.05723 (0.05746)	1.3882	8474.0
0.300 (0.296)	12.6828	1221.3 (1212.6)	1041.3	0.05643 (0.05668)	1.3334	8632.5
0.200 (0.195)	17.4741	1174.6 (1169.8)	1067.7	0.05533 (0.05558)	1.2643	8850.7
0.100 (0.097)	31.0889	1098.0 (1100.7)	1111.3	0.05350 (0.05371)	1.1730	9209.5
0.080 (0.078)	37.6278	1074.4 (1078.8)	1124.6	0.05295 (0.05311)	1.1515	9321.6
0.060 (0.058)	48.2246	1044.4 (1050.4)	1141.6	0.05224 (0.05234)	1.1297	9463.5
0.050 (0.049)	56.4805	1025.6 (1032.2)	1152.1	0.05179 (0.05185)	1.1194	9552.0
0.040 (0.039)	68.5918	1003.0 (1009.7)	1164.7	0.05127 (0.05127)	1.1103	9659.3
0.030 (0.030)	88.1735	974.4 (980.4)	1180.4	0.05061 (0.05053)	1.1041	9795.7
0.020 (0.020)	125.6849	934.7 (938.3)	1201.8	0.04972 (0.04953)	1.1058	9985.1
0.010 (0.010)	230.1874	868.0 (866.3)	1236.1	0.04828 (0.04799)	1.1341	10301.9
0.008 (0.008)	279.6453	847.0 (843.5)	1246.4	0.04785 (0.04755)	1.1494	10402.3
0.006 (0.006)	359.0837	819.8 (815.1)	1259.2	0.04731 (0.04706)	1.1732	10530.2
0.005 (0.005)	420.5391	802.5 (797.8)	1267.2	0.04698 (0.04678)	1.1904	10610.4
0.004 (0.004)	510.0623	781.4 (777.5)	1276.6	0.04659 (0.04649)	1.2137	10707.5
0.003 (0.003)	653.5854	754.2 (753.0)	1288.3	0.04610 (0.04620)	1.2470	10830.7
0.002 (0.002)	925.3232	715.8 (722.7)	1303.9	0.04544 (0.04598)	1.2995	10999.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

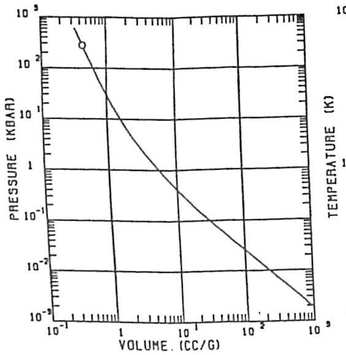
RDX60/TNT40/WAX0.5 RHO = 1.7300 G/CC EO = 1.816507E+03 CAL/MOLE

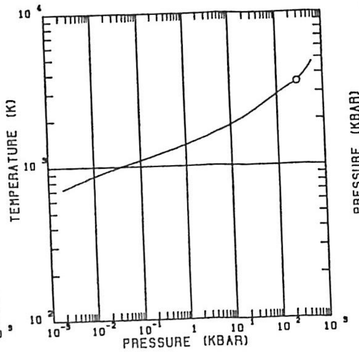
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

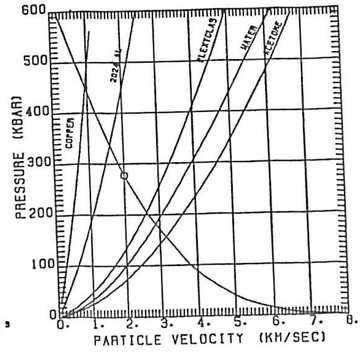
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
277.548	1.27937	0.67246	0.04851	1.07176	0.00344	0.00009	0.00243	0.00130	0.00003	0.00000	0.00312	1.35766
200.000	1.27168	0.65441	0.09470	1.07181	0.00862	0.00002	0.00421	0.00091	0.00005	0.00003	0.00125	1.32950
100.000	1.23365	0.59413	0.25506	1.06943	0.03709	0.00000	0.01008	0.00028	0.00006	0.00055	0.00014	1.22889
80.000	1.21332	0.57342	0.31701	1.06833	0.05275	0.00000	0.01236	0.00017	0.00006	0.00121	0.00007	1.18699
60.000	1.18070	0.54987	0.39685	1.06689	0.07750	0.00000	0.01528	0.00009	0.00005	0.00298	0.00002	1.12893
50.000	1.15651	0.53789	0.44506	1.06604	0.09522	0.00000	0.01698	0.00005	0.00004	0.00494	0.00001	1.09075
40.000	1.12343	0.52699	0.49997	1.06514	0.11824	0.00000	0.01879	0.00003	0.00003	0.00862	0.00001	1.04305
30.000	1.07755	0.51968	0.56049	1.06437	0.14781	0.00000	0.02033	0.00001	0.00002	0.01563	0.00000	0.98284
20.000	1.00306	0.52106	0.63223	1.06382	0.18703	0.00000	0.02144	0.00000	0.00001	0.03244	0.00000	0.89290
10.000	0.87419	0.55018	0.70288	1.06465	0.23283	0.00000	0.01978	0.00000	0.00000	0.07522	0.00000	0.75036
8.000	0.83605	0.56372	0.71394	1.06520	0.24191	0.00000	0.01867	0.00000	0.00000	0.09058	0.00000	0.71039
6.000	0.79139	0.58284	0.72037	1.06600	0.25033	0.00000	0.01709	0.00000	0.00000	0.10989	0.00000	0.66555
5.000	0.76618	0.59555	0.72017	1.06651	0.25412	0.00000	0.01606	0.00000	0.00000	0.12137	0.00000	0.64157
4.000	0.73872	0.61148	0.71576	1.06714	0.25750	0.00000	0.01481	0.00000	0.00000	0.13435	0.00000	0.61707
3.000	0.70870	0.63227	0.70421	1.06790	0.26035	0.00000	0.01328	0.00000	0.00000	0.14908	0.00000	0.59309
2.000	0.67424	0.65972	0.68378	1.06887	0.26379	0.00000	0.01135	0.00000	0.00000	0.16604	0.00000	0.56911
1.000	0.63822	0.70766	0.62392	1.07022	0.26518	0.00000	0.00866	0.00000	0.00000	0.18538	0.00000	0.56168
0.800	0.63115	0.72251	0.60129	1.07058	0.26527	0.00000	0.00793	0.00000	0.00000	0.18941	0.00000	0.56544
0.600	0.62498	0.74136	0.56976	1.07100	0.26514	0.00000	0.00709	0.00000	0.00000	0.19319	0.00000	0.57433
0.500	0.62269	0.75315	0.54848	1.07124	0.26490	0.00000	0.00660	0.00000	0.00000	0.19482	0.00000	0.58220
0.400	0.62144	0.76728	0.52147	1.07152	0.26453	0.00000	0.00605	0.00000	0.00000	0.19605	0.00000	0.59384
0.300	0.62226	0.78507	0.48507	1.07185	0.26380	0.00000	0.00539	0.00000	0.00000	0.19650	0.00000	0.61200
0.200	0.62745	0.80925	0.43153	1.07226	0.26215	0.00000	0.00458	0.00000	0.00000	0.19534	0.00000	0.64253
0.100	0.64478	0.84733	0.33805	1.07283	0.25681	0.00000	0.00343	0.00000	0.00000	0.19020	0.00000	0.70306
0.080	0.65171	0.85827	0.30923	1.07299	0.25452	0.00000	0.00312	0.00000	0.00000	0.18812	0.00000	0.72301
0.060	0.66168	0.87150	0.27281	1.07317	0.25067	0.00000	0.00276	0.00000	0.00000	0.18533	0.00000	0.74901
0.050	0.66851	0.87935	0.25028	1.07327	0.24766	0.00000	0.00255	0.00000	0.00000	0.18358	0.00000	0.76543
0.040	0.67711	0.88817	0.22405	1.07339	0.24362	0.00000	0.00232	0.00000	0.00000	0.18147	0.00000	0.78496
0.030	0.68887	0.89833	0.19198	1.07353	0.23748	0.00000	0.00205	0.00000	0.00000	0.17886	0.00000	0.80947
0.020	0.70672	0.91011	0.15057	1.07369	0.22686	0.00000	0.00171	0.00000	0.00000	0.17550	0.00000	0.84246
0.010	0.74137	0.92247	0.09122	1.07393	0.20260	0.00000	0.00126	0.00000	0.00000	0.17065	0.00000	0.89429
0.008	0.75349	0.92411	0.07581	1.07399	0.19345	0.00000	0.00113	0.00000	0.00000	0.16925	0.00000	0.90946
0.006	0.77021	0.92456	0.05821	1.07406	0.18027	0.00000	0.00099	0.00000	0.00000	0.16759	0.00000	0.92827
0.005	0.78148	0.92379	0.04847	1.07410	0.17119	0.00000	0.00091	0.00000	0.00000	0.16656	0.00000	0.93980
0.004	0.79582	0.92179	0.03814	1.07415	0.15957	0.00000	0.00082	0.00000	0.00000	0.16527	0.00000	0.95343
0.003	0.81536	0.91752	0.02715	1.07420	0.14374	0.00000	0.00071	0.00000	0.00000	0.16350	0.00000	0.97045
0.002	0.84492	0.90844	0.01577	1.07427	0.12037	0.00000	0.00057	0.00000	0.00000	0.16051	0.00000	0.99392
300.000	1.28007	0.67397	0.04339	1.07133	0.00291	0.00014	0.00224	0.00154	0.00003	0.00000	0.00418	1.36127
400.000	1.28125	0.67478	0.03073	1.06772	0.00170	0.00061	0.00183	0.00285	0.00004	0.00000	0.01181	1.37313
500.000	1.28078	0.66852	0.02610	1.06090	0.00126	0.00168	0.00183	0.00466	0.00004	0.00000	0.02546	1.38401
600.000	1.27850	0.65662	0.02883	1.05153	0.00129	0.00310	0.00250	0.00712	0.00006	0.00000	0.04352	1.39318

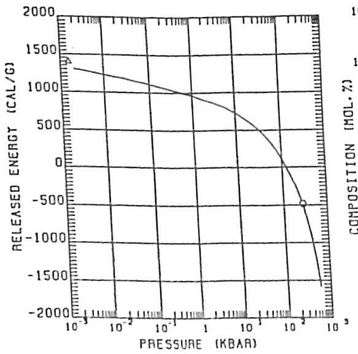
PRESS ;KBAR, PRODUCTS ;MOLES

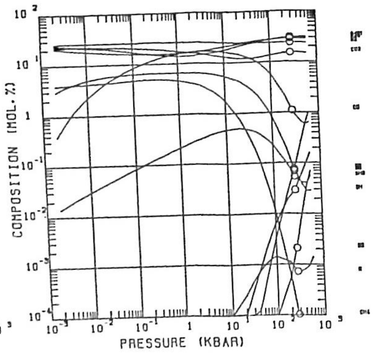
K-H-T ISENTROPE THRU C-J POINT











RDX60/TNT40/WAX0.5

RHO (G/CC)	1.730
E_0 (KCAL/MOLE)	1.82
D_{C-J} (M/SEC)	7985.
P_{C-J} (KBAR)	277.5
T_{C-J} (K)	3499.

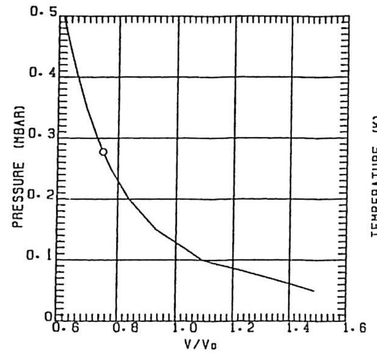
DATE 82-10-22

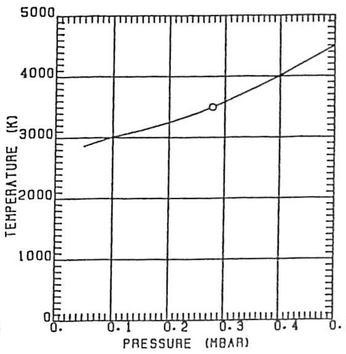
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

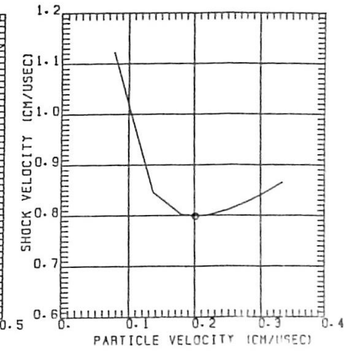
RDX60/TNT40/WAX0.5 RHO = 1.7300 G/CC, EO = 1.816507E+03 CAL/MOLE

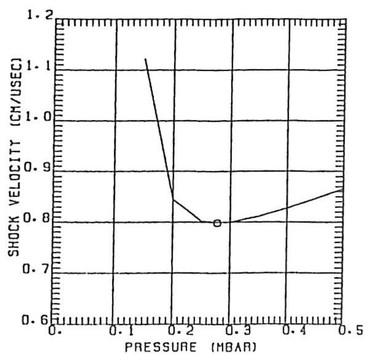
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3550	0.3681	0.3829	0.4002	0.4214	0.4482	0.4845	0.5382	0.6315	0.8621
TEMP (DEG K)	4501.8	4249.1	4011.0	3787.4	3583.9	3401.3	3245.1	3117.9	3010.2	2863.6
US (M/SEC)	8653.9	8462.4	8276.5	8110.2	8000.3	8022.4	8451.7	11219.7	0.0	0.0
UP (M/SEC)	3339.7	3073.8	2793.6	2494.5	2167.6	1801.3	1367.8	772.8	0.0	0.0
H2O (MOLE)	1.2781	1.2795	1.2803	1.2806	1.2800	1.2782	1.2737	1.2617	1.2224	1.0410
CO2 (MOLE)	0.6594	0.6669	0.6718	0.6743	0.6738	0.6699	0.6598	0.6354	0.5742	0.4208
CO (MOLE)	0.0361	0.0348	0.0352	0.0375	0.0438	0.0561	0.0824	0.1439	0.3060	0.7947
N2 (MOLE)	1.0568	1.0626	1.0668	1.0696	1.0713	1.0721	1.0722	1.0713	1.0686	1.0611
H2 (MOLE)	0.0019	0.0019	0.0020	0.0023	0.0029	0.0043	0.0074	0.0160	0.0453	0.1824
O2 (MOLE)	0.0023	0.0014	0.0007	0.0003	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0025	0.0022	0.0021	0.0021	0.0023	0.0027	0.0037	0.0060	0.0118	0.0269
OH (MOLE)	0.0068	0.0049	0.0034	0.0023	0.0016	0.0011	0.0007	0.0005	0.0004	0.0002
H (MOLE)	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0008	0.0116
NO (MOLE)	0.0330	0.0217	0.0134	0.0078	0.0042	0.0021	0.0010	0.0005	0.0002	0.0001
C(S) (MOLE)	1.3831	1.3769	1.3716	1.3668	1.3611	1.3526	1.3365	1.2992	1.1977	0.8516

K-H-T HUGONIOT









RDX60/TNT40/WAX0.5

RHO (G/CC)	1.730
E_0 (KCAL/MOLE)	1.82

DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

RDX/77/TNT23/WAX 0.5 RHO = 1.7430 G/CC EO = 4.172473E+03 CAL/MOLE

LN P = -3.52684975 E+00 -2.44003773 E+00LN V 3.23203981 E-01LN V*2 -3.07998918 E-02LN V*3 7.85454176 E-04LN V*4

LN T = 7.70185852 E+00 -4.63446200 E-01LN V 1.30645275 E-01LN V*2 -2.03654505 E-02LN V*3 1.08185410 E-03LN V*4

LN E = -1.61711502 E+00 4.68476415 E-01LNP 7.28299022 E-02LN P*2 5.57819009 E-03LN P*3 1.58310169 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (647.663)	0.3354	4550.0 (4412.2)	-1522.9	0.16372 (0.15911)	3.2605	363.8
500.000 (518.044)	0.3594	4185.5 (4171.0)	-1181.3	0.14942 (0.14828)	3.2016	859.7
400.000 (404.633)	0.3886	3859.3 (3923.6)	-854.2	0.13574 (0.13678)	3.1363	1403.3
300.000 (299.320)	0.4283	3528.0 (3647.3)	-521.4	0.12182 (0.12431)	3.0565	2033.8
* 296.057 (295.147)	0.4303	3514.3 (3635.1)	-507.1	0.12122 (0.12379)	3.0528	2061.3
200.000 (193.902)	0.4950	3294.2 (3293.4)	-222.9	0.10933 (0.11029)	2.9413	2867.9
100.000 (95.326)	0.6353	2873.6 (2810.0)	161.7	0.09323 (0.09317)	2.7526	4031.1
80.000 (76.278)	0.6895	2741.2 (2679.3)	258.4	0.08919 (0.08899)	2.6933	4352.1
60.000 (57.398)	0.7674	2574.9 (2525.2)	368.6	0.08458 (0.08433)	2.6177	4735.0
50.000 (48.013)	0.8221	2474.7 (2435.2)	430.2	0.08200 (0.08174)	2.5702	4961.3
40.000 (38.639)	0.8955	2358.3 (2332.4)	498.2	0.07916 (0.07890)	2.5125	5223.3
30.000 (29.004)	1.0055	2221.7 (2206.8)	574.0	0.07598 (0.07570)	2.4365	5548.3
20.000 (19.714)	1.1822	2047.6 (2054.6)	664.6	0.07219 (0.07193)	2.3344	5952.0
10.000 (10.173)	1.5872	1808.1 (1833.0)	784.0	0.06720 (0.06697)	2.1608	6566.7
8.000 (8.211)	1.7549	1744.3 (1770.5)	815.6	0.06588 (0.06567)	2.1052	6747.8
6.000 (6.210)	2.0085	1670.7 (1695.2)	852.0	0.06435 (0.06418)	2.0331	6972.6
5.000 (5.194)	2.1951	1628.2 (1650.4)	873.1	0.06347 (0.06331)	1.9874	7110.2
4.000 (4.167)	2.4564	1579.7 (1598.5)	897.5	0.06245 (0.06233)	1.9315	7273.8
3.000 (3.120)	2.8617	1524.2 (1535.6)	925.0	0.06130 (0.06117)	1.8589	7479.3
2.000 (2.070)	3.5908	1452.4 (1455.7)	962.0	0.05975 (0.05970)	1.7581	7754.6
1.000 (1.019)	5.4842	1347.0 (1339.7)	1017.8	0.05741 (0.05749)	1.5921	8193.7
0.800 (0.811)	6.3473	1316.6 (1307.2)	1034.2	0.05673 (0.05683)	1.5412	8327.7
0.600 (0.603)	7.7189	1279.1 (1268.3)	1054.7	0.05587 (0.05601)	1.4781	8495.8
0.500 (0.500)	8.7759	1256.1 (1245.1)	1067.4	0.05534 (0.05550)	1.4397	8600.0
0.400 (0.398)	10.3177	1228.8 (1218.1)	1082.5	0.05471 (0.05488)	1.3948	8725.5
0.300 (0.296)	12.8085	1194.5 (1185.2)	1101.7	0.05391 (0.05410)	1.3404	8884.3
0.200 (0.195)	17.6081	1147.3 (1141.4)	1128.1	0.05280 (0.05300)	1.2720	9102.6
0.100 (0.097)	31.2026	1069.4 (1070.6)	1171.6	0.05098 (0.05116)	1.1819	9461.5
0.080 (0.078)	37.7165	1045.2 (1048.1)	1184.9	0.05042 (0.05057)	1.1608	9573.5
0.060 (0.059)	48.2507	1014.3 (1018.9)	1201.8	0.04972 (0.04982)	1.1397	9715.2
0.050 (0.049)	56.4446	994.8 (1000.2)	1212.2	0.04928 (0.04934)	1.1299	9803.5
0.040 (0.039)	68.4397	971.3 (977.1)	1224.7	0.04876 (0.04877)	1.1214	9910.4
0.030 (0.030)	87.7825	941.3 (946.7)	1240.3	0.04811 (0.04805)	1.1162	10046.1
0.020 (0.020)	124.6789	899.4 (903.1)	1261.4	0.04722 (0.04708)	1.1193	10234.1
0.010 (0.010)	226.6503	828.2 (827.5)	1294.9	0.04582 (0.04558)	1.1509	10547.1
0.008 (0.008)	274.5549	805.4 (803.3)	1304.9	0.04540 (0.04516)	1.1675	10645.9
0.006 (0.006)	351.1311	775.9 (772.6)	1317.3	0.04488 (0.04466)	1.1930	10771.5
0.005 (0.005)	410.1179	757.2 (753.6)	1324.9	0.04456 (0.04439)	1.2114	10849.9
0.004 (0.004)	495.6633	734.2 (731.0)	1334.0	0.04419 (0.04409)	1.2362	10944.8
0.003 (0.003)	632.0352	704.7 (703.2)	1345.1	0.04372 (0.04379)	1.2715	11064.8
0.002 (0.002)	886.7207	662.0 (667.1)	1360.3	0.04308 (0.04354)	1.3270	11228.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

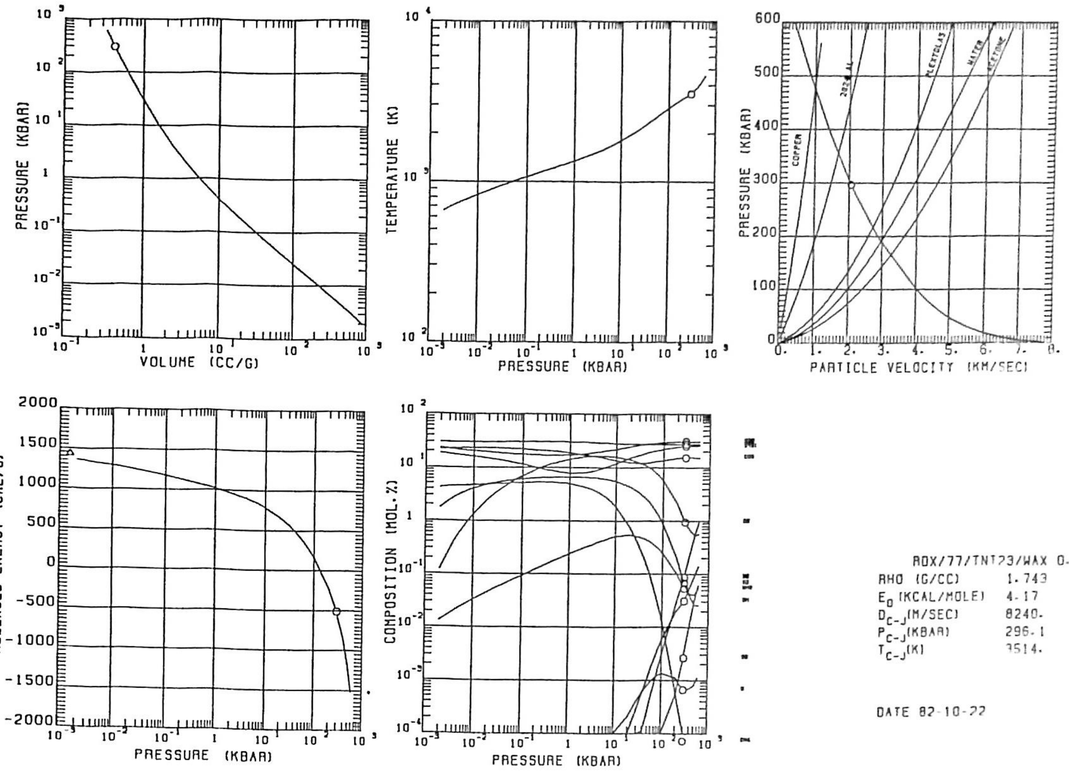
RDX/77/TNT23/WAX 0.5 RHO = 1.7430 G/CC EO = 4.172473E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
296.057	1.32259	0.65941	0.04083	1.18886	0.00289	0.00011	0.00230	0.00135	0.00003	0.00000	0.00373	1.08408
200.000	1.31367	0.64013	0.09148	1.18904	0.00876	0.00002	0.00446	0.00086	0.00005	0.00003	0.00123	1.05270
100.000	1.27520	0.58428	0.24340	1.18650	0.03724	0.00000	0.01063	0.00025	0.00006	0.00054	0.00013	0.95610
80.000	1.25471	0.56529	0.30204	1.18533	0.05288	0.00000	0.01304	0.00015	0.00005	0.00119	0.00006	0.91579
60.000	1.22209	0.54419	0.37698	1.18381	0.07743	0.00000	0.01611	0.00008	0.00004	0.00294	0.00002	0.86021
50.000	1.19798	0.53376	0.42200	1.18292	0.09496	0.00000	0.01791	0.00005	0.00003	0.00489	0.00001	0.82367
40.000	1.16509	0.52471	0.47302	1.18197	0.11766	0.00000	0.01982	0.00003	0.00003	0.00857	0.00000	0.77803
30.000	1.11954	0.51971	0.52859	1.18115	0.14670	0.00000	0.02145	0.00001	0.00002	0.01560	0.00000	0.72043
20.000	1.04529	0.52432	0.59363	1.18055	0.18508	0.00000	0.02266	0.00000	0.00001	0.03263	0.00000	0.63374
10.000	0.91527	0.55866	0.65498	1.18140	0.22945	0.00000	0.02096	0.00000	0.00000	0.07673	0.00000	0.49395
8.000	0.87696	0.57431	0.66200	1.18198	0.23763	0.00000	0.01980	0.00000	0.00000	0.09267	0.00000	0.45534
6.000	0.83136	0.59562	0.66498	1.18282	0.24526	0.00000	0.01813	0.00000	0.00000	0.11291	0.00000	0.41083
5.000	0.80544	0.60959	0.66296	1.18336	0.24859	0.00000	0.01704	0.00000	0.00000	0.12503	0.00000	0.38674
4.000	0.77726	0.62705	0.65623	1.18402	0.25131	0.00000	0.01572	0.00000	0.00000	0.13875	0.00000	0.36232
3.000	0.74479	0.64808	0.64664	1.18483	0.25453	0.00000	0.01411	0.00000	0.00000	0.15457	0.00000	0.33505
2.000	0.71054	0.67892	0.61922	1.18586	0.25578	0.00000	0.01204	0.00000	0.00000	0.17262	0.00000	0.31358
1.000	0.67354	0.72932	0.55542	1.18730	0.25497	0.00000	0.00917	0.00000	0.00000	0.19368	0.00000	0.30591
0.800	0.66631	0.74465	0.53199	1.18768	0.25433	0.00000	0.00841	0.00000	0.00000	0.19819	0.00000	0.30951
0.600	0.66013	0.76396	0.49956	1.18813	0.25315	0.00000	0.00751	0.00000	0.00000	0.20255	0.00000	0.31827
0.500	0.65794	0.77589	0.47789	1.18839	0.25219	0.00000	0.00699	0.00000	0.00000	0.20451	0.00000	0.32605
0.400	0.65691	0.79005	0.45061	1.18868	0.25088	0.00000	0.00640	0.00000	0.00000	0.20612	0.00000	0.33755
0.300	0.65809	0.80766	0.41420	1.18903	0.24887	0.00000	0.00571	0.00000	0.00000	0.20705	0.00000	0.35541
0.200	0.66424	0.83108	0.36121	1.18947	0.24514	0.00000	0.00484	0.00000	0.00000	0.20649	0.00000	0.38554
0.100	0.68423	0.86647	0.27046	1.19008	0.23546	0.00000	0.00362	0.00000	0.00000	0.20226	0.00000	0.44514
0.080	0.69230	0.87614	0.24305	1.19024	0.23156	0.00000	0.00329	0.00000	0.00000	0.20042	0.00000	0.46471
0.060	0.70389	0.88748	0.20878	1.19043	0.22544	0.00000	0.00291	0.00000	0.00000	0.19797	0.00000	0.49010
0.050	0.71182	0.89394	0.18795	1.19055	0.22091	0.00000	0.00269	0.00000	0.00000	0.19644	0.00000	0.50601
0.040	0.72201	0.90084	0.16395	1.19067	0.21484	0.00000	0.00243	0.00000	0.00000	0.19457	0.00000	0.52496
0.030	0.73597	0.90821	0.13526	1.19082	0.20593	0.00000	0.00214	0.00000	0.00000	0.19227	0.00000	0.54859
0.020	0.75734	0.91543	0.09947	1.19100	0.19110	0.00000	0.00178	0.00000	0.00000	0.18927	0.00000	0.58016
0.010	0.79892	0.91832	0.05211	1.19125	0.15962	0.00000	0.00129	0.00000	0.00000	0.18459	0.00000	0.62931
0.008	0.81358	0.91663	0.04084	1.19132	0.14827	0.00000	0.00115	0.00000	0.00000	0.18304	0.00000	0.64382
0.006	0.83369	0.91261	0.02878	1.19140	0.13262	0.00000	0.00099	0.00000	0.00000	0.18092	0.00000	0.66201
0.005	0.84712	0.90900	0.02256	1.19144	0.12234	0.00000	0.00090	0.00000	0.00000	0.17942	0.00000	0.67333
0.004	0.86417	0.90358	0.01637	1.19149	0.10961	0.00000	0.00080	0.00000	0.00000	0.17733	0.00000	0.68704
0.003	0.88721	0.89507	0.01037	1.19156	0.09321	0.00000	0.00068	0.00000	0.00000	0.17411	0.00000	0.70478
0.002	0.92271	0.88008	0.00485	1.19163	0.07004	0.00000	0.00053	0.00000	0.00000	0.16805	0.00000	0.73134
300.000	1.32273	0.65969	0.03988	1.18878	0.00280	0.00012	0.00226	0.00139	0.00003	0.00000	0.00393	1.08475
400.000	1.32406	0.66059	0.02761	1.18542	0.00159	0.00052	0.00180	0.00254	0.00003	0.00000	0.01111	1.09612
500.000	1.32384	0.65516	0.02274	1.17915	0.00113	0.00143	0.00174	0.00404	0.00003	0.00000	0.02372	1.10642
600.000	1.32203	0.64508	0.02438	1.17079	0.00111	0.00257	0.00232	0.00597	0.00005	0.00000	0.03985	1.11485

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT

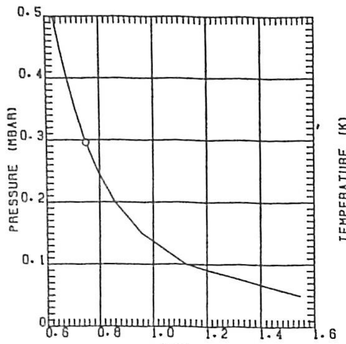


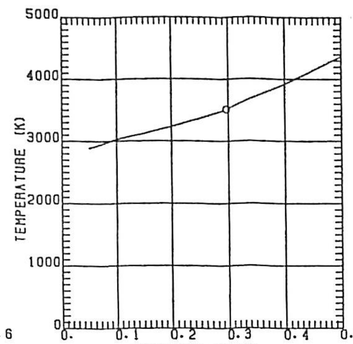
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

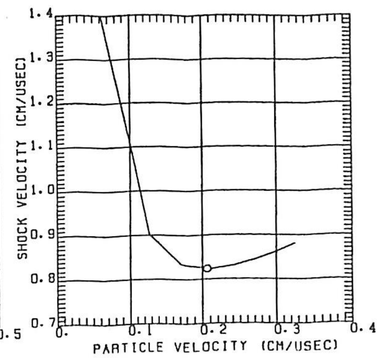
RDX/77/TNT23/WAX 0.5 RHO = 1.7430 G/CC, EO = 4.172473E+03 CAL/MOLE

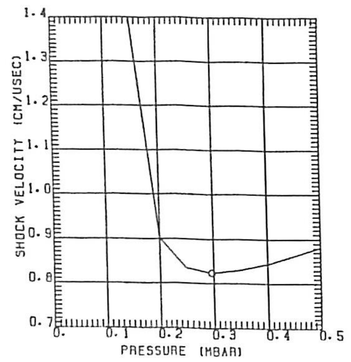
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3617	0.3745	0.3894	0.4068	0.4283	0.4557	0.4929	0.5485	0.6456	0.8873
TEMP (DEG K)	4372.1	4136.9	3917.2	3713.1	3528.0	3364.0	3226.5	3117.9	3026.9	2891.4
US (M/SEC)	8809.4	8623.5	8450.5	8308.5	8240.3	8349.1	9025.7	13989.1	0.0	0.0
UP (M/SEC)	3256.3	2993.8	2715.7	2416.8	2088.7	1717.9	1271.3	615.2	0.0	0.0
H2O (MOLE)	1.3218	1.3229	1.3235	1.3235	1.3227	1.3207	1.3156	1.3021	1.2578	1.0553
CO2 (MOLE)	0.6481	0.6546	0.6588	0.6605	0.6597	0.6555	0.6449	0.6195	0.5559	0.4008
CO (MOLE)	0.0303	0.0294	0.0303	0.0333	0.0399	0.0528	0.0803	0.1454	0.3173	0.8303
N2 (MOLE)	1.1758	1.1810	1.1848	1.1873	1.1888	1.1894	1.1894	1.1883	1.1851	1.1766
H2 (MOLE)	0.0016	0.0016	0.0018	0.0021	0.0028	0.0042	0.0076	0.0170	0.0499	0.2019
O2 (MOLE)	0.0019	0.0011	0.0006	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0023	0.0020	0.0020	0.0020	0.0023	0.0028	0.0040	0.0067	0.0133	0.0305
OH (MOLE)	0.0056	0.0041	0.0029	0.0020	0.0014	0.0010	0.0007	0.0005	0.0004	0.0003
H (MOLE)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0003
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0009	0.0132
NO (MOLE)	0.0298	0.0197	0.0122	0.0071	0.0039	0.0021	0.0010	0.0005	0.0002	0.0001
C(S) (MOLE)	1.1059	1.1003	1.0953	1.0905	1.0847	1.0760	1.0591	1.0194	0.9103	0.5400

K-H-T HUGONIOT









RDX/77/TNT23/WAX 0.5
RHO (G/CC) 1.743
E_0 (KCAL/MOLE) 4.17

DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

HMX76/TNT23 OCTOL RHO = 1.8090 G/CC EO = 3.128011E+03 CAL/MOLE

LN P = -3.55567932 E+00 -2.44557476 E+00LN V 3.25567901 E-01LN V**2 -3.10937315 E-02LN V**3 7.79350521 E-04LN V**4

LN T = 7.67447662 E+00 -4.50522423 E-01LN V 1.24642909 E-01LN V**2 -1.92908160 E-02LN V**3 1.00179110 E-03LN V**4

LN E = -1.64458942 E+00 4.60230947 E-01LNP 7.12130070 E-02LN P**2 5.43422997 E-03LN P**3 1.53897025 E-04LN P**4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (647.472)	0.3334	4344.2 (4216.0)	-1429.0	0.15979 (0.15539)	3.2774	588.8
500.000 (518.347)	0.3571	3998.5 (3995.0)	-1099.2	0.14599 (0.14498)	3.2184	1079.3
400.000 (405.478)	0.3857	3689.7 (3768.2)	-783.0	0.13276 (0.13391)	3.1533	1616.6
* 321.067 (321.631)	0.4154	3443.7 (3569.4)	-526.9	0.12205 (0.12452)	3.0917	2100.5
300.000 (298.513)	0.4256	3410.4 (3508.4)	-472.5	0.11977 (0.12189)	3.0719	2253.9
200.000 (193.434)	0.4915	3193.2 (3179.8)	-180.9	0.10757 (0.10834)	2.9563	3082.8
100.000 (95.165)	0.6298	2796.2 (2728.2)	195.7	0.09181 (0.09174)	2.7669	4236.0
80.000 (76.178)	0.6831	2670.2 (2605.4)	290.4	0.08785 (0.08768)	2.7074	4553.9
60.000 (57.344)	0.7598	2511.9 (2460.3)	398.0	0.08335 (0.08315)	2.6315	4933.2
50.000 (47.979)	0.8136	2416.3 (2375.4)	458.2	0.08083 (0.08063)	2.5839	5157.5
40.000 (38.623)	0.8857	2305.1 (2278.0)	524.5	0.07805 (0.07786)	2.5260	5416.9
30.000 (28.994)	0.9939	2174.2 (2158.7)	598.5	0.07496 (0.07473)	2.4496	5739.1
20.000 (19.717)	1.1673	2006.8 (2013.6)	687.0	0.07126 (0.07104)	2.3471	6138.7
10.000 (10.173)	1.5647	1776.2 (1801.0)	803.0	0.06640 (0.06619)	2.1725	6747.8
8.000 (8.218)	1.7284	1713.5 (1741.0)	834.4	0.06509 (0.06492)	2.1167	6926.4
6.000 (6.217)	1.9765	1641.9 (1668.2)	870.0	0.06360 (0.06345)	2.0443	7148.8
5.000 (5.200)	2.1592	1600.6 (1624.7)	890.6	0.06274 (0.06260)	1.9982	7285.0
4.000 (4.164)	2.4170	1555.1 (1573.9)	912.9	0.06180 (0.06164)	1.9414	7448.2
3.000 (3.123)	2.8111	1499.6 (1513.0)	941.0	0.06063 (0.06051)	1.8688	7650.3
2.000 (2.072)	3.5234	1429.4 (1434.8)	977.1	0.05912 (0.05906)	1.7673	7922.6
1.000 (1.020)	5.3714	1326.0 (1320.4)	1031.6	0.05684 (0.05690)	1.5998	8356.6
0.800 (0.811)	6.2131	1296.2 (1288.2)	1047.5	0.05617 (0.05626)	1.5484	8489.0
0.600 (0.603)	7.5495	1259.3 (1249.5)	1067.5	0.05534 (0.05545)	1.4847	8654.9
0.500 (0.500)	8.5786	1236.7 (1226.4)	1079.8	0.05482 (0.05496)	1.4461	8757.8
0.400 (0.398)	10.0787	1209.7 (1199.4)	1094.5	0.05420 (0.05436)	1.4007	8881.6
0.300 (0.296)	12.5002	1175.8 (1166.4)	1113.2	0.05343 (0.05360)	1.3458	9038.1
0.200 (0.195)	17.1625	1129.1 (1122.5)	1138.8	0.05235 (0.05254)	1.2768	9253.3
0.100 (0.097)	30.3545	1051.3 (1051.3)	1181.1	0.05058 (0.05075)	1.1859	9606.9
0.080 (0.078)	36.6699	1027.1 (1028.6)	1194.0	0.05004 (0.05018)	1.1648	9717.2
0.060 (0.059)	46.8770	995.9 (999.3)	1210.3	0.04936 (0.04945)	1.1436	9856.6
0.050 (0.049)	54.8110	976.3 (980.5)	1220.5	0.04893 (0.04900)	1.1338	9943.6
0.040 (0.039)	66.4168	952.6 (957.2)	1232.6	0.04843 (0.04845)	1.1255	10048.7
0.030 (0.030)	85.1107	922.1 (926.7)	1247.7	0.04780 (0.04775)	1.1206	10182.1
0.020 (0.020)	120.7094	879.4 (882.8)	1268.0	0.04695 (0.04681)	1.1244	10366.7
0.010 (0.010)	218.7638	806.5 (806.2)	1300.3	0.04560 (0.04537)	1.1576	10673.7
0.008 (0.008)	264.6770	783.2 (781.6)	1309.9	0.04519 (0.04496)	1.1749	10770.4
0.006 (0.006)	337.9470	752.9 (750.2)	1321.8	0.04469 (0.04448)	1.2014	10893.1
0.005 (0.005)	393.5559	732.5 (730.9)	1329.6	0.04437 (0.04422)	1.2203	10968.9
0.004 (0.004)	475.0300	709.0 (707.4)	1338.2	0.04401 (0.04393)	1.2460	11061.6
0.003 (0.003)	604.7231	678.9 (678.2)	1348.7	0.04357 (0.04364)	1.2827	11178.8
0.002 (0.002)	848.0920	637.0 (639.4)	1362.7	0.04299 (0.04340)	1.3405	11339.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

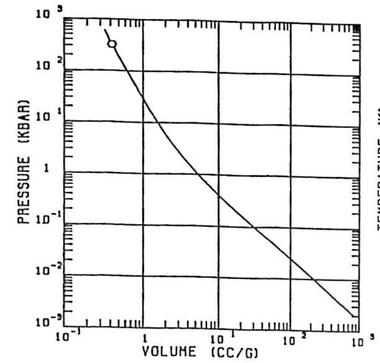
HMX76/TNT23 OCTOL RHO = 1.8090 G/CC EO = 3.128011E+03 CAL/MOLE

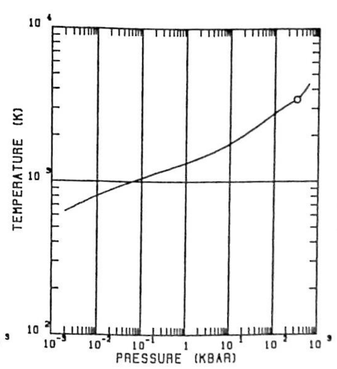
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

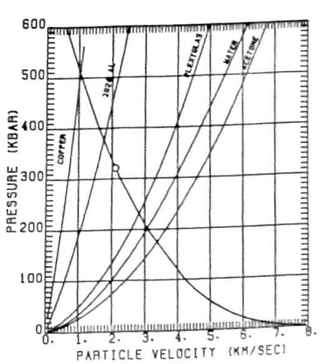
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
321.067	1.28687	0.68408	0.02711	1.18443	0.00166	0.00012	0.00155	0.00105	0.00002	0.00000	0.00369	1.04974
300.000	1.28616	0.68237	0.03197	1.18462	0.00207	0.00009	0.00177	0.00100	0.00002	0.00000	0.00308	1.04660
200.000	1.27884	0.66523	0.07620	1.18477	0.00679	0.00002	0.00359	0.00063	0.00003	0.00002	0.00096	1.01949
100.000	1.24673	0.61407	0.21196	1.18254	0.03038	0.00000	0.00892	0.00019	0.00004	0.00040	0.00010	0.93451
80.000	1.22931	0.59606	0.26555	1.18150	0.04365	0.00000	0.01105	0.00011	0.00004	0.00090	0.00005	0.89844
60.000	1.20113	0.57544	0.33505	1.18012	0.06489	0.00000	0.01384	0.00006	0.00003	0.00228	0.00002	0.84817
50.000	1.18005	0.56496	0.37713	1.17928	0.08029	0.00000	0.01552	0.00004	0.00002	0.00387	0.00001	0.81498
40.000	1.15095	0.55559	0.42499	1.17837	0.10052	0.00000	0.01736	0.00002	0.00002	0.00693	0.00000	0.77343
30.000	1.11004	0.54994	0.47722	1.17753	0.12685	0.00000	0.01904	0.00001	0.00001	0.01297	0.00000	0.72081
20.000	1.04191	0.55345	0.53834	1.17681	0.16255	0.00000	0.02048	0.00000	0.00001	0.02810	0.00000	0.64105
10.000	0.91807	0.58627	0.59655	1.17733	0.20576	0.00000	0.01943	0.00000	0.00000	0.06921	0.00000	0.50891
8.000	0.88142	0.60226	0.60122	1.17783	0.21355	0.00000	0.01844	0.00000	0.00000	0.08438	0.00000	0.47308
6.000	0.83672	0.62356	0.60332	1.17856	0.22127	0.00000	0.01698	0.00000	0.00000	0.10397	0.00000	0.43008
5.000	0.81098	0.63745	0.60128	1.17905	0.22477	0.00000	0.01601	0.00000	0.00000	0.11582	0.00000	0.40639
4.000	0.78152	0.65358	0.59849	1.17964	0.22869	0.00000	0.01483	0.00000	0.00000	0.12947	0.00000	0.37940
3.000	0.75023	0.67571	0.58553	1.18038	0.23114	0.00000	0.01334	0.00000	0.00000	0.14501	0.00000	0.35469
2.000	0.71569	0.70631	0.55888	1.18134	0.23255	0.00000	0.01142	0.00000	0.00000	0.16301	0.00000	0.33273
1.000	0.67803	0.75579	0.49759	1.18269	0.23179	0.00000	0.00872	0.00000	0.00000	0.18425	0.00000	0.32332
0.800	0.67052	0.77069	0.47530	1.18305	0.23112	0.00000	0.00800	0.00000	0.00000	0.18888	0.00000	0.32608
0.600	0.66403	0.78934	0.44449	1.18348	0.22981	0.00000	0.00715	0.00000	0.00000	0.19342	0.00000	0.33368
0.500	0.66159	0.80082	0.42397	1.18373	0.22875	0.00000	0.00666	0.00000	0.00000	0.19553	0.00000	0.34061
0.400	0.66028	0.81434	0.39824	1.18401	0.22730	0.00000	0.00610	0.00000	0.00000	0.19734	0.00000	0.35103
0.300	0.66120	0.83103	0.36394	1.18434	0.22501	0.00000	0.00544	0.00000	0.00000	0.19852	0.00000	0.36745
0.200	0.66697	0.85296	0.31433	1.18475	0.22081	0.00000	0.00461	0.00000	0.00000	0.19835	0.00000	0.39529
0.100	0.68659	0.88530	0.23003	1.18533	0.21009	0.00000	0.00345	0.00000	0.00000	0.19477	0.00000	0.45084
0.080	0.69466	0.89389	0.20478	1.18549	0.20579	0.00000	0.00313	0.00000	0.00000	0.19313	0.00000	0.46913
0.060	0.70632	0.90371	0.17348	1.18568	0.19913	0.00000	0.00276	0.00000	0.00000	0.19091	0.00000	0.49283
0.050	0.71437	0.90912	0.15462	1.18578	0.19425	0.00000	0.00255	0.00000	0.00000	0.18948	0.00000	0.50772
0.040	0.72470	0.91474	0.13305	1.18591	0.18776	0.00000	0.00231	0.00000	0.00000	0.18774	0.00000	0.52541
0.030	0.73891	0.92038	0.10757	1.18605	0.17831	0.00000	0.00202	0.00000	0.00000	0.18558	0.00000	0.54742
0.020	0.76080	0.92499	0.07646	1.18622	0.16285	0.00000	0.00168	0.00000	0.00000	0.18262	0.00000	0.57687
0.010	0.80339	0.92338	0.03710	1.18647	0.13109	0.00000	0.00119	0.00000	0.00000	0.17757	0.00000	0.62288
0.008	0.81842	0.92033	0.02819	1.18653	0.11992	0.00000	0.00106	0.00000	0.00000	0.17573	0.00000	0.63668
0.006	0.83897	0.91465	0.01901	1.18661	0.10493	0.00000	0.00091	0.00000	0.00000	0.17307	0.00000	0.65420
0.005	0.85375	0.90971	0.01412	1.18665	0.09419	0.00000	0.00082	0.00000	0.00000	0.17112	0.00000	0.66599
0.004	0.87098	0.90324	0.00983	1.18670	0.08265	0.00000	0.00072	0.00000	0.00000	0.16835	0.00000	0.67951
0.003	0.89416	0.89363	0.00588	1.18676	0.06824	0.00000	0.00060	0.00000	0.00000	0.16406	0.00000	0.69736
0.002	0.92828	0.87822	0.00259	1.18684	0.04971	0.00000	0.00046	0.00000	0.00000	0.15637	0.00000	0.72375
400.000	1.28756	0.68427	0.02011	1.18218	0.00104	0.00038	0.00128	0.00170	0.00002	0.00000	0.00846	1.05656
500.000	1.28741	0.67986	0.01656	1.17715	0.00074	0.00107	0.00124	0.00276	0.00002	0.00000	0.01856	1.06452
600.000	1.28608	0.67165	0.01802	1.17035	0.00072	0.00194	0.00167	0.00413	0.00003	0.00000	0.03173	1.07127

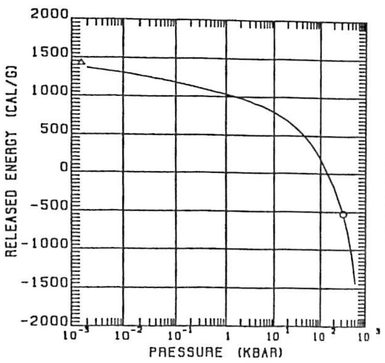
PRESS ;KBAR, PRODUCTS ;MOLES

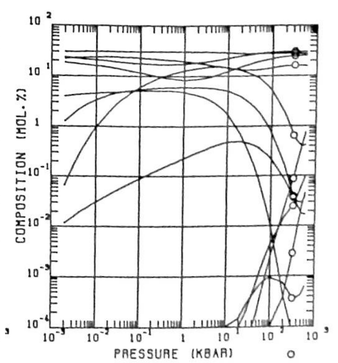
K-H-T ISENTROPE THRU C-J POINT











HMX76/TNT23 OCTOL

RHO (G/CC)	1.809
E_0 (KCAL/MOLE)	3.13
D_{C-J} (M/SEC)	8449.
P_{C-J} (KBAR)	321.1
T_{C-J} (K)	3444.

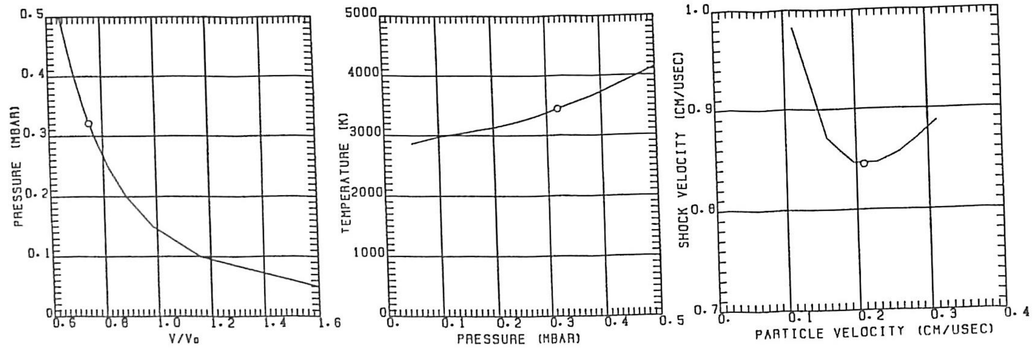
DATE 82-10-22

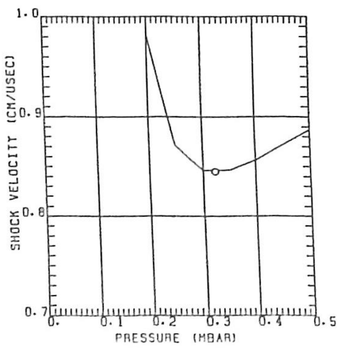
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

HMX76/TNT23 OCTOL RHO = 1.8090 G/CC, EO = 3.128011E+03 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3587	0.3715	0.3862	0.4035	0.4248	0.4522	0.4894	0.5448	0.6418	0.8831
TEMP	(DEG K)	4135.4	3919.8	3721.2	3539.2	3376.5	3237.6	3125.3	3043.0	2979.4	2869.0
US	(M/SEC)	8872.6	8708.4	8564.8	8465.3	8464.6	8715.5	9818.5	0.0	0.0	0.0
UP	(M/SEC)	3115.2	2856.5	2581.7	2285.5	1959.2	1585.6	1126.0	0.0	0.0	0.0
H2O	(MOLE)	1.2863	1.2870	1.2873	1.2872	1.2865	1.2848	1.2805	1.2687	1.2284	1.0377
CO2	(MOLE)	0.6756	0.6805	0.6834	0.6845	0.6835	0.6794	0.6695	0.6452	0.5810	0.4178
CO	(MOLE)	0.0211	0.0205	0.0214	0.0241	0.0297	0.0413	0.0663	0.1272	0.2963	0.8136
N2	(MOLE)	1.1751	1.1791	1.1819	1.1837	1.1848	1.1852	1.1851	1.1840	1.1811	1.1729
H2	(MOLE)	0.0010	0.0010	0.0011	0.0014	0.0019	0.0031	0.0058	0.0139	0.0437	0.1874
O2	(MOLE)	0.0013	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.0015	0.0014	0.0014	0.0014	0.0017	0.0022	0.0032	0.0056	0.0118	0.0283
OH	(MOLE)	0.0036	0.0026	0.0018	0.0013	0.0009	0.0007	0.0005	0.0004	0.0004	0.0002
H	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0007	0.0118
NO	(MOLE)	0.0223	0.0145	0.0089	0.0052	0.0029	0.0015	0.0008	0.0004	0.0002	0.0001
C(S)	(MOLE)	1.0643	1.0600	1.0561	1.0524	1.0478	1.0402	1.0251	0.9885	0.8830	0.5177

K-H-T HUGONIOT





HMX76/TNT23 OCTOL
RHO (G/CC) 1.809
E_0 (KCAL/MOLE) 3.13

DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

HMX80/TNT20 OCTOL RHO = 1.8000 G/CC EO = 3.333227E+03 CAL/MOLE

LN P = -3.54538155 E+00 -2.44732380 E+00LN V 3.25686753 E-01LN V*2 -3.11333835 E-02LN V*3 7.80415488 E-04LN V*4

LN T = 7.67416096 E+00 -4.51689184 E-01LN V 1.24587834 E-01LN V*2 -1.92698240 E-02LN V*3 9.96298855 E-04LN V*4

LN E = -1.64208317 E+00 4.61183190 E-01LNP 7.12398291 E-02LN P*2 5.43275848 E-03LN P*3 1.53853340 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G)	GAMMA	MASS VELOC. (M/SEC)
600.000 (646.642)	0.3348	4333.8 (4205.6)	-1436.2	0.16009 (0.15571)	3.2759	585.3
500.000 (518.054)	0.3585	3989.6 (3985.9)	-1105.6	0.14626 (0.14525)	3.2172	1076.1
400.000 (405.425)	0.3872	3681.7 (3760.0)	-788.4	0.13299 (0.13413)	3.1521	1614.1
* 320.287 (320.859)	0.4173	3433.9 (3559.8)	-529.0	0.12213 (0.12461)	3.0900	2104.2
300.000 (298.610)	0.4272	3401.9 (3501.2)	-476.4	0.11993 (0.12206)	3.0708	2252.2
200.000 (193.543)	0.4933	3185.8 (3173.5)	-183.6	0.10768 (0.10846)	2.9553	3082.5
100.000 (95.230)	0.6322	2790.9 (2722.8)	194.4	0.09187 (0.09179)	2.7660	4238.2
80.000 (76.228)	0.6857	2665.3 (2600.2)	289.5	0.08789 (0.08771)	2.7065	4556.9
60.000 (57.379)	0.7628	2507.6 (2455.3)	397.7	0.08336 (0.08316)	2.6306	4937.3
50.000 (48.005)	0.8168	2412.2 (2370.5)	458.2	0.08083 (0.08062)	2.5830	5162.1
40.000 (38.640)	0.8892	2301.0 (2273.2)	524.8	0.07804 (0.07784)	2.5251	5422.3
30.000 (29.008)	0.9979	2170.1 (2154.1)	599.3	0.07493 (0.07470)	2.4487	5745.2
20.000 (19.720)	1.1722	2002.7 (2009:1)	688.2	0.07120 (0.07099)	2.3462	6146.1
10.000 (10.170)	1.5718	1771.8 (1796.6)	805.0	0.06632 (0.06611)	2.1716	6757.1
8.000 (8.215)	1.7364	1709.1 (1736.6)	836.6	0.06500 (0.06483)	2.1158	6936.2
6.000 (6.214)	1.9858	1637.4 (1663.9)	872.5	0.06350 (0.06336)	2.0434	7159.2
5.000 (5.197)	2.1695	1596.2 (1620.5)	893.1	0.06263 (0.06250)	1.9974	7295.7
4.000 (4.161)	2.4288	1550.7 (1569.6)	915.6	0.06169 (0.06154)	1.9407	7459.4
3.000 (3.121)	2.8249	1495.2 (1508.7)	943.8	0.06051 (0.06039)	1.8681	7661.9
2.000 (2.071)	3.5407	1425.0 (1430.6)	980.1	0.05899 (0.05894)	1.7668	7934.8
1.000 (1.019)	5.3975	1321.5 (1316.2)	1034.8	0.05670 (0.05676)	1.5997	8369.7
0.800 (0.811)	6.2430	1291.7 (1283.9)	1050.9	0.05603 (0.05612)	1.5485	8502.3
0.600 (0.603)	7.5850	1254.7 (1245.1)	1070.9	0.05519 (0.05531)	1.4850	8668.5
0.500 (0.500)	8.6182	1232.1 (1221.9)	1083.3	0.05468 (0.05481)	1.4465	8771.6
0.400 (0.398)	10.1239	1205.0 (1194.8)	1098.1	0.05406 (0.05421)	1.4012	8895.6
0.300 (0.296)	12.5541	1171.0 (1161.7)	1116.7	0.05328 (0.05344)	1.3466	9052.4
0.200 (0.196)	17.2310	1124.1 (1117.5)	1142.4	0.05220 (0.05238)	1.2779	9267.9
0.100 (0.097)	30.4550	1046.0 (1045.8)	1184.8	0.05043 (0.05059)	1.1877	9622.0
0.080 (0.078)	36.7820	1021.6 (1022.9)	1197.8	0.04988 (0.05002)	1.1667	9732.4
0.060 (0.059)	47.0031	990.2 (993.3)	1214.2	0.04920 (0.04929)	1.1458	9872.0
0.050 (0.049)	54.9448	970.4 (974.4)	1224.3	0.04877 (0.04884)	1.1361	9959.0
0.040 (0.039)	66.5567	946.5 (950.9)	1236.4	0.04827 (0.04829)	1.1279	10064.2
0.030 (0.030)	85.2496	915.7 (920.1)	1251.5	0.04764 (0.04759)	1.1232	10197.6
0.020 (0.020)	120.8147	872.6 (875.8)	1271.9	0.04678 (0.04666)	1.1273	10382.2
0.010 (0.010)	218.6235	798.8 (798.7)	1304.1	0.04544 (0.04521)	1.1608	10688.8
0.008 (0.008)	264.3584	775.2 (773.8)	1313.6	0.04504 (0.04480)	1.1782	10785.2
0.006 (0.006)	337.2544	744.6 (742.2)	1325.5	0.04454 (0.04433)	1.2047	10907.6
0.005 (0.005)	392.6392	724.1 (722.6)	1333.2	0.04422 (0.04407)	1.2236	10983.3
0.004 (0.004)	473.6726	700.4 (698.9)	1341.7	0.04386 (0.04378)	1.2494	11075.7
0.003 (0.003)	602.5361	670.1 (669.3)	1352.2	0.04342 (0.04349)	1.2861	11192.5
0.002 (0.002)	844.1038	627.9 (630.0)	1366.1	0.04284 (0.04325)	1.3439	11352.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

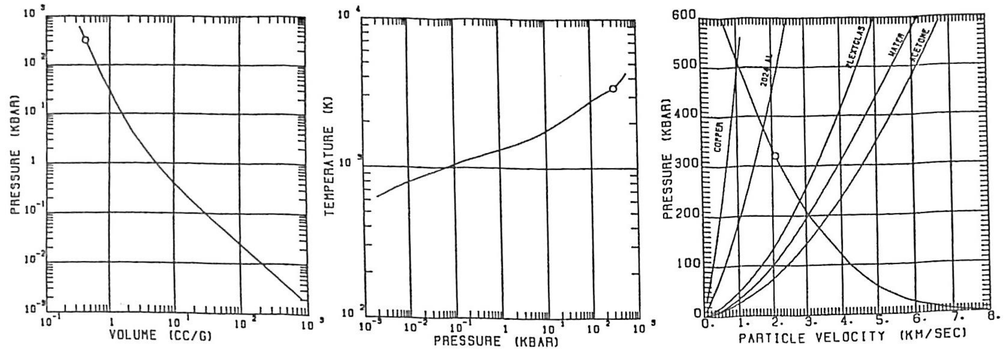
HMX80/TNT20 OCTOL RHO = 1.8000 G/CC EO = 3.333227E+03 CAL/MOLE

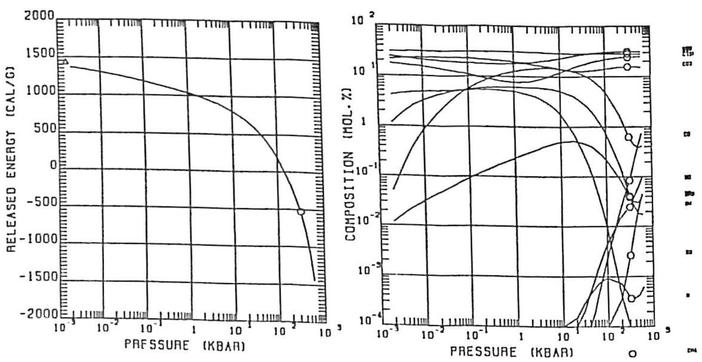
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
320.287	1.33241	0.66271	0.02662	1.20996	0.00174	0.00011	0.00163	0.00105	0.00002	0.00000	0.00362	1.04306
300.000	1.33169	0.66112	0.03120	1.21014	0.00215	0.00009	0.00185	0.00100	0.00002	0.00000	0.00304	1.04007
200.000	1.32401	0.64461	0.07451	1.21022	0.00707	0.00002	0.00379	0.00063	0.00003	0.00002	0.00094	1.01325
100.000	1.29017	0.59546	0.20796	1.20779	0.03177	0.00000	0.00949	0.00019	0.00004	0.00042	0.00010	0.92854
80.000	1.27181	0.57831	0.26074	1.20668	0.04567	0.00000	0.01177	0.00011	0.00004	0.00096	0.00005	0.89237
60.000	1.24215	0.55893	0.32926	1.20519	0.06788	0.00000	0.01477	0.00006	0.00003	0.00245	0.00002	0.84175
50.000	1.21999	0.54928	0.37076	1.20430	0.08395	0.00000	0.01656	0.00003	0.00002	0.00416	0.00001	0.80820
40.000	1.18945	0.54095	0.41797	1.20333	0.10499	0.00000	0.01852	0.00002	0.00002	0.00745	0.00000	0.76602
30.000	1.14658	0.53663	0.46950	1.20244	0.13226	0.00000	0.02029	0.00001	0.00001	0.01392	0.00000	0.71234
20.000	1.07536	0.54209	0.52981	1.20170	0.16893	0.00000	0.02177	0.00000	0.00001	0.03009	0.00000	0.63039
10.000	0.94627	0.57794	0.58720	1.20232	0.21258	0.00000	0.02054	0.00000	0.00000	0.07373	0.00000	0.49351
8.000	0.90820	0.59476	0.59164	1.20286	0.22024	0.00000	0.01945	0.00000	0.00000	0.08976	0.00000	0.45622
6.000	0.86181	0.61707	0.59342	1.20365	0.22772	0.00000	0.01788	0.00000	0.00000	0.11039	0.00000	0.41150
5.000	0.83508	0.63146	0.59138	1.20417	0.23108	0.00000	0.01684	0.00000	0.00000	0.12286	0.00000	0.38669
4.000	0.80450	0.64822	0.58843	1.20480	0.23481	0.00000	0.01558	0.00000	0.00000	0.13722	0.00000	0.35851
3.000	0.77213	0.67100	0.57526	1.20559	0.23697	0.00000	0.01400	0.00000	0.00000	0.15352	0.00000	0.33263
2.000	0.73639	0.70228	0.54843	1.20661	0.23799	0.00000	0.01197	0.00000	0.00000	0.17240	0.00000	0.30927
1.000	0.69750	0.75253	0.48683	1.20803	0.23657	0.00000	0.00913	0.00000	0.00000	0.19469	0.00000	0.29832
0.800	0.68979	0.76757	0.46446	1.20841	0.23567	0.00000	0.00836	0.00000	0.00000	0.19956	0.00000	0.30080
0.600	0.68314	0.78635	0.43357	1.20885	0.23408	0.00000	0.00748	0.00000	0.00000	0.20435	0.00000	0.30812
0.500	0.68070	0.79783	0.41304	1.20911	0.23284	0.00000	0.00696	0.00000	0.00000	0.20658	0.00000	0.31494
0.400	0.67944	0.81136	0.38725	1.20941	0.23114	0.00000	0.00637	0.00000	0.00000	0.20850	0.00000	0.32527
0.300	0.68045	0.82799	0.35299	1.20975	0.22853	0.00000	0.00568	0.00000	0.00000	0.20982	0.00000	0.34158
0.200	0.68659	0.84965	0.30353	1.21019	0.22381	0.00000	0.00482	0.00000	0.00000	0.20976	0.00000	0.36946
0.100	0.70727	0.88115	0.21986	1.21080	0.21200	0.00000	0.00360	0.00000	0.00000	0.20623	0.00000	0.42516
0.080	0.71578	0.88934	0.19492	1.21096	0.20728	0.00000	0.00327	0.00000	0.00000	0.20459	0.00000	0.44351
0.060	0.72804	0.89865	0.16410	1.21116	0.20005	0.00000	0.00288	0.00000	0.00000	0.20237	0.00000	0.46727
0.050	0.73652	0.90365	0.14562	1.21127	0.19477	0.00000	0.00266	0.00000	0.00000	0.20093	0.00000	0.48219
0.040	0.74740	0.90874	0.12455	1.21140	0.18777	0.00000	0.00240	0.00000	0.00000	0.19918	0.00000	0.49990
0.030	0.76237	0.91363	0.09981	1.21154	0.17763	0.00000	0.00211	0.00000	0.00000	0.19699	0.00000	0.52196
0.020	0.78542	0.91707	0.06990	1.21173	0.16116	0.00000	0.00174	0.00000	0.00000	0.19398	0.00000	0.55145
0.010	0.83027	0.91319	0.03284	1.21198	0.12779	0.00000	0.00124	0.00000	0.00000	0.18862	0.00000	0.59774
0.008	0.84603	0.90941	0.02463	1.21205	0.11620	0.00000	0.00110	0.00000	0.00000	0.18664	0.00000	0.61171
0.006	0.86762	0.90278	0.01631	1.21213	0.10078	0.00000	0.00094	0.00000	0.00000	0.18367	0.00000	0.62963
0.005	0.88296	0.89728	0.01198	1.21218	0.09000	0.00000	0.00084	0.00000	0.00000	0.18146	0.00000	0.64166
0.004	0.90097	0.89016	0.00821	1.21223	0.07837	0.00000	0.00074	0.00000	0.00000	0.17835	0.00000	0.65567
0.003	0.92519	0.87976	0.00480	1.21230	0.06400	0.00000	0.00062	0.00000	0.00000	0.17352	0.00000	0.67430
0.002	0.96091	0.86329	0.00204	1.21237	0.04583	0.00000	0.00047	0.00000	0.00000	0.16486	0.00000	0.70219
400.000	1.33317	0.66284	0.01967	1.20773	0.00108	0.00036	0.00134	0.00171	0.00002	0.00000	0.00838	1.04988
500.000	1.33303	0.65842	0.01620	1.20273	0.00077	0.00103	0.00129	0.00277	0.00002	0.00000	0.01842	1.05776
600.000	1.33168	0.65032	0.01762	1.19597	0.00075	0.00188	0.00174	0.00415	0.00003	0.00000	0.03150	1.06445

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT





HMX80/TNT20 OCTOL

RHO (G/CC)	1.800
E_0 (KCAL/MOLE)	3.33
D_{C-J} (M/SEC)	8456.
P_{C-J} (KBAR)	320.3
T_{C-J} (K)	3434.

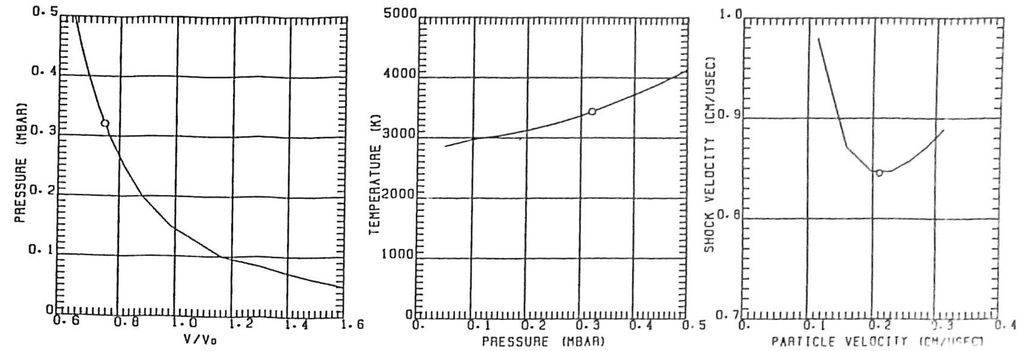
DATE 82-10-22

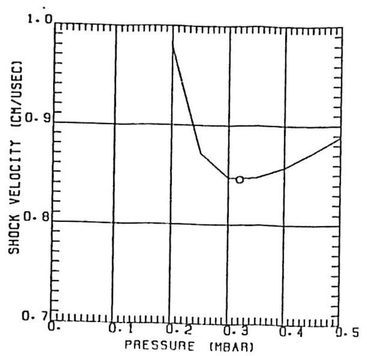
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

HMX80/TNT20 OCTOL RHO = 1.8000 G/CC, EO = 3.333227E+03 CAL/MOLE

PRESSURE (KBAR)		500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3602	0.3730	0.3877	0.4051	0.4265	0.4539	0.4912	0.5468	0.6441	0.8862
TEMP	(DEG K)	4128.9	3913.0	3714.2	3531.9	3368.9	3229.6	3117.2	3035.1	2972.5	2863.5
US	(M/SEC)	8887.3	8721.4	8575,6	8473.5	8469.1	8713.1	9794.4	0.0	0.0	0.0
UP	(M/SEC)	3125.6	2866.5	2591.3	2294.7	1967.9	1594.0	1134.4	0.0	0.0	0.0
H2O	(MOLE)	1.3318	1.3326	1.3329	1.3328	1.3321	1.3302	1.3257	1.3134	1.2710	1.0712
CO2	(MOLE)	0.6541	0.6590	0.6620	0.6631	0.6622	0.6583	0.6488	0.6255	0.5638	0.4080
CO	(MOLE)	0.0207	0.0201	0.0210	0.0236	0.0290	0.0403	0.0647	0.1242	0.2903	0.8019
N2	(MOLE)	1.2007	1.2046	1.2074	1.2093	1.2103	1.2107	1.2105	1.2094	1.2062	1.1975
H2	(MOLE)	0.0010	0.0010	0.0012	0.0014	0.0020	0.0032	0.0061	0.0145	0.0456	0.1953
O2	(MOLE)	0.0013	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.0016	0.0015	0.0014	0.0015	0.0017	0.0023	0.0034	0.0059	0.0125	0.0301
OH	(MOLE)	0.0036	0.0026	0.0018	0.0013	0.0009	0.0007	0.0005	0.0004	0.0004	0.0002
H	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0007	0.0126
NO	(MOLE)	0.0222	0.0145	0.0089	0.0051	0.0028	0.0015	0.0008	0.0004	0.0002	0.0001
C(S)	(MOLE)	1.0575	1.0532	1.0494	1.0457	1.0412	1.0338	1.0189	0.9826	0.8776	0.5099

K-H-T HUGONIOT





HMX80/TNT20 OCTOL

RHO (G/CC)	1.800
E_0 (KCAL/MOLE)	3.33

DATE 82-10-22

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

PETN50/TNT50PENTOLITE RHO = 1.6500 G/CC EO = -2.324231E+04 CAL/MOLE

LN P = -3.59532356 E+00 -2.41611004 E+00LN V 3.28521371 E-01LN V*2 -3.33879180 E-02LN V*3 1.07355765 E-03LN V*4

LN T = 7.73622322 E+00 -4.70234573 E-01LN V 1.41169488 E-01LN V*2 -2.27167755 E-02LN V*3 1.29813002 E-03LN V*4

LN E = -1.59334087 E+00 4.54864323 E-01LNP 7.15029836 E-02LN P*2 5.47757372 E-03LN P*3 1.54648413 E-04LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (535.445)	0.3465	4621.2 (4545.1)	-1353.9	0.15665 (0.15319)	3.2301	243.8
400.000 (414.308)	0.3755	4241.2 (4250.6)	-1009.0	0.14222 (0.14168)	3.1598	791.6
300.000 (303.699)	0.4148	3867.1 (3926.5)	-667.2	0.12791 (0.12918)	3.0747	1423.0
* 235.043 (235.230)	0.4512	3606.9 (3684.3)	-434.6	0.11818 (0.12027)	3.0046	1908.4
200.000 (197.624)	0.4784	3503.7 (3530.6)	-327.2	0.11369 (0.11509)	2.9568	2227.8
100.000 (95.896)	0.6162	3028.0 (2980.0)	56.1	0.09765 (0.09787)	2.7582	3398.5
80.000 (76.521)	0.6693	2880.8 (2833.5)	152.3	0.09363 (0.09367)	2.6963	3719.0
60.000 (57.395)	0.7459	2698.1 (2662.0)	262.1	0.08903 (0.08898)	2.6175	4100.9
50.000 (47.922)	0.7996	2589.0 (2562.4)	323.5	0.08646 (0.08637)	2.5681	4326.4
40.000 (38.509)	0.8716	2463.9 (2449.4)	390.8	0.08365 (0.08352)	2.5083	4586.3
30.000 (28.838)	0.9799	2318.9 (2311.9)	465.6	0.08052 (0.08030)	2.4295	4909.3
20.000 (19.595)	1.1529	2135.6 (2147.6)	555.0	0.07678 (0.07652)	2.3247	5307.7
10.000 (10.132)	1.5487	1885.5 (1911.6)	673.4	0.07183 (0.07157)	2.1475	5913.1
8.000 (8.171)	1.7142	1820.8 (1845.2)	703.4	0.07057 (0.07029)	2.0904	6092.9
6.000 (6.185)	1.9631	1744.9 (1766.2)	739.3	0.06907 (0.06881)	2.0172	6314.8
5.000 (5.175)	2.1468	1701.0 (1719.3)	760.2	0.06819 (0.06795)	1.9707	6450.9
4.000 (4.153)	2.4042	1651.3 (1665.4)	784.2	0.06719 (0.06699)	1.9139	6612.8
3.000 (3.119)	2.8007	1592.9 (1600.9)	813.0	0.06599 (0.06585)	1.8410	6814.9
2.000 (2.068)	3.5239	1521.0 (1518.9)	848.3	0.06451 (0.06440)	1.7388	7089.2
1.000 (1.020)	5.4031	1414.5 (1402.7)	903.8	0.06218 (0.06223)	1.5721	7525.9
0.800 (0.812)	6.2628	1384.0 (1370.7)	920.2	0.06150 (0.06158)	1.5213	7659.5
0.600 (0.605)	7.6331	1346.6 (1332.8)	940.7	0.06064 (0.06077)	1.4584	7827.5
0.500 (0.501)	8.6921	1323.8 (1310.5)	953.4	0.06011 (0.06027)	1.4203	7931.9
0.400 (0.399)	10.2407	1296.8 (1284.7)	968.6	0.05947 (0.05966)	1.3756	8057.7
0.300 (0.297)	12.7511	1263.2 (1253.6)	987.9	0.05867 (0.05888)	1.3218	8217.3
0.200 (0.196)	17.6088	1217.4 (1212.8)	1014.6	0.05755 (0.05778)	1.2542	8437.2
0.100 (0.097)	31.4693	1143.2 (1147.5)	1058.8	0.05570 (0.05591)	1.1653	8800.0
0.080 (0.078)	38.1481	1120.6 (1126.8)	1072.4	0.05513 (0.05531)	1.1444	8913.5
0.060 (0.059)	48.9983	1092.0 (1100.0)	1089.6	0.05441 (0.05453)	1.1230	9057.5
0.050 (0.049)	57.4676	1074.2 (1082.9)	1100.5	0.05396 (0.05404)	1.1127	9147.4
0.040 (0.039)	69.9256	1053.0 (1061.6)	1113.3	0.05342 (0.05345)	1.1033	9256.5
0.030 (0.030)	90.1345	1026.3 (1033.8)	1129.4	0.05275 (0.05270)	1.0964	9395.4
0.020 (0.020)	129.0419	989.7 (994.0)	1151.4	0.05182 (0.05167)	1.0958	9588.6
0.010 (0.010)	238.4976	929.4 (926.7)	1187.2	0.05033 (0.05006)	1.1165	9912.7
0.008 (0.008)	290.7539	910.6 (905.9)	1198.0	0.04988 (0.04960)	1.1282	10015.8
0.006 (0.006)	375.2407	886.7 (880.4)	1211.6	0.04931 (0.04907)	1.1464	10147.4
0.005 (0.005)	440.9146	871.5 (865.2)	1220.2	0.04895 (0.04876)	1.1596	10229.9
0.004 (0.004)	537.2119	853.2 (847.9)	1230.2	0.04853 (0.04843)	1.1772	10330.2
0.003 (0.003)	692.7668	829.7 (828.2)	1242.8	0.04800 (0.04808)	1.2021	10457.9
0.002 (0.002)	990.3450	796.7 (806.4)	1259.8	0.04729 (0.04777)	1.2404	10634.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-22>> **********

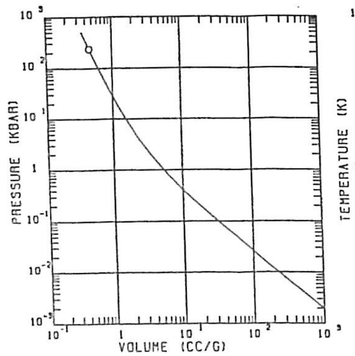
PETN50/TNT50PENTOLITE RHO = 1.6500 G/CC EO = -2.324231E+04 CAL/MOLE

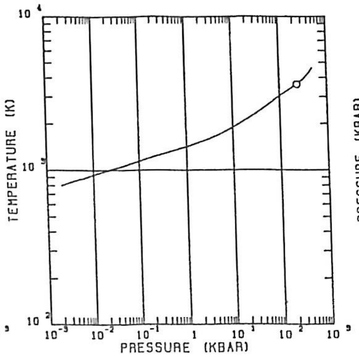
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

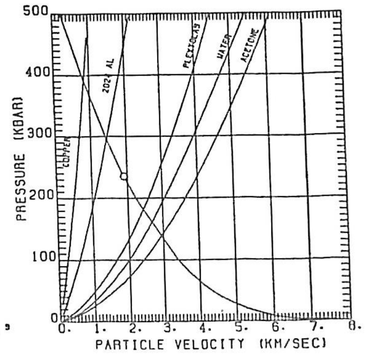
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
235.043	1.17199	0.96398	0.11404	0.64386	0.00609	0.00011	0.00262	0.00181	0.00007	0.00002	0.00270	1.25370
200.000	1.16819	0.94773	0.15172	0.64403	0.00905	0.00006	0.00325	0.00148	0.00008	0.00003	0.00173	1.23224
100.000	1.13639	0.85354	0.37460	0.64302	0.03506	0.00000	0.00680	0.00044	0.00009	0.00053	0.00019	1.10306
80.000	1.11978	0.82135	0.45587	0.64243	0.04873	0.00000	0.00809	0.00027	0.00008	0.00108	0.00009	1.05343
60.000	1.09314	0.78345	0.55849	0.64164	0.07017	0.00000	0.00973	0.00013	0.00006	0.00248	0.00003	0.98731
50.000	1.07328	0.76290	0.61953	0.64116	0.08559	0.00000	0.01069	0.00008	0.00005	0.00400	0.00002	0.94530
40.000	1.04607	0.74232	0.68795	0.64065	0.10569	0.00000	0.01172	0.00005	0.00004	0.00679	0.00001	0.89467
30.000	1.00820	0.72448	0.76153	0.64021	0.13179	0.00000	0.01262	0.00002	0.00003	0.01201	0.00000	0.83371
20.000	0.94555	0.71259	0.84799	0.63983	0.16797	0.00000	0.01338	0.00001	0.00001	0.02468	0.00000	0.74648
10.000	0.83473	0.72737	0.92924	0.64020	0.21376	0.00000	0.01263	0.00000	0.00000	0.05776	0.00000	0.61737
8.000	0.80061	0.73720	0.94371	0.64050	0.22425	0.00000	0.01204	0.00000	0.00000	0.07002	0.00000	0.58080
6.000	0.76084	0.75343	0.95103	0.64095	0.23437	0.00000	0.01113	0.00000	0.00000	0.08553	0.00000	0.54176
5.000	0.73808	0.76486	0.95094	0.64126	0.23935	0.00000	0.01052	0.00000	0.00000	0.09488	0.00000	0.52107
4.000	0.71308	0.77969	0.94629	0.64164	0.24424	0.00000	0.00977	0.00000	0.00000	0.10550	0.00000	0.50027
3.000	0.68543	0.79972	0.93387	0.64211	0.24905	0.00000	0.00882	0.00000	0.00000	0.11763	0.00000	0.48053
2.000	0.65330	0.82681	0.91183	0.64272	0.25499	0.00000	0.00760	0.00000	0.00000	0.13164	0.00000	0.46147
1.000	0.61836	0.87649	0.84741	0.64359	0.26084	0.00000	0.00586	0.00000	0.00000	0.14750	0.00000	0.46034
0.800	0.61112	0.89236	0.82292	0.64383	0.26236	0.00000	0.00538	0.00000	0.00000	0.15071	0.00000	0.46576
0.600	0.60442	0.91283	0.78867	0.64411	0.26411	0.00000	0.00482	0.00000	0.00000	0.15360	0.00000	0.47664
0.500	0.60164	0.92583	0.76547	0.64428	0.26510	0.00000	0.00449	0.00000	0.00000	0.15475	0.00000	0.48570
0.400	0.59958	0.94162	0.73595	0.64446	0.26630	0.00000	0.00412	0.00000	0.00000	0.15546	0.00000	0.49873
0.300	0.59896	0.96186	0.69609	0.64468	0.26774	0.00000	0.00368	0.00000	0.00000	0.15538	0.00000	0.51842
0.200	0.60161	0.99022	0.63673	0.64496	0.26943	0.00000	0.00313	0.00000	0.00000	0.15362	0.00000	0.55116
0.100	0.61293	1.03732	0.53120	0.64535	0.27102	0.00000	0.00234	0.00000	0.00000	0.14776	0.00000	0.61546
0.080	0.61756	1.05160	0.49802	0.64546	0.27131	0.00000	0.00213	0.00000	0.00000	0.14545	0.00000	0.63667
0.060	0.62424	1.06957	0.45542	0.64558	0.27115	0.00000	0.00189	0.00000	0.00000	0.14238	0.00000	0.66438
0.050	0.62883	1.08075	0.42846	0.64565	0.27064	0.00000	0.00175	0.00000	0.00000	0.14044	0.00000	0.68208
0.040	0.63453	1.09373	0.39679	0.64573	0.26993	0.00000	0.00159	0.00000	0.00000	0.13807	0.00000	0.70314
0.030	0.64227	1.10969	0.35715	0.64583	0.26846	0.00000	0.00140	0.00000	0.00000	0.13507	0.00000	0.72983
0.020	0.65389	1.13057	0.30376	0.64594	0.26517	0.00000	0.00118	0.00000	0.00000	0.13108	0.00000	0.76631
0.010	0.67627	1.16125	0.22005	0.64609	0.25531	0.00000	0.00087	0.00000	0.00000	0.12505	0.00000	0.82539
0.008	0.68398	1.16935	0.19613	0.64613	0.25122	0.00000	0.00079	0.00000	0.00000	0.12330	0.00000	0.84294
0.006	0.69466	1.17860	0.16695	0.64618	0.24481	0.00000	0.00070	0.00000	0.00000	0.12123	0.00000	0.86493
0.005	0.70206	1.18372	0.14931	0.64621	0.23989	0.00000	0.00064	0.00000	0.00000	0.12003	0.00000	0.87865
0.004	0.71132	1.18903	0.12945	0.64624	0.23350	0.00000	0.00058	0.00000	0.00000	0.11865	0.00000	0.89460
0.003	0.72413	1.19434	0.10602	0.64627	0.22408	0.00000	0.00051	0.00000	0.00000	0.11700	0.00000	0.91436
0.002	0.74414	1.19874	0.07722	0.64632	0.20832	0.00000	0.00043	0.00000	0.00000	0.11494	0.00000	0.94083
300.000	1.17458	0.97612	0.08199	0.64235	0.00374	0.00037	0.00210	0.00292	0.00007	0.00001	0.00624	1.27361
400.000	1.17548	0.98035	0.05841	0.63752	0.00223	0.00139	0.00177	0.00510	0.00007	0.00000	0.01621	1.29297
500.000	1.17456	0.97333	0.04946	0.62919	0.00168	0.00359	0.00180	0.00798	0.00008	0.00000	0.03286	1.30894

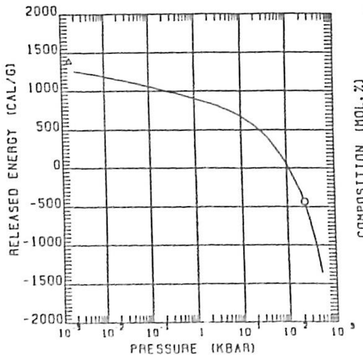
PRESS ;KBAR, PRODUCTS ;MOLES

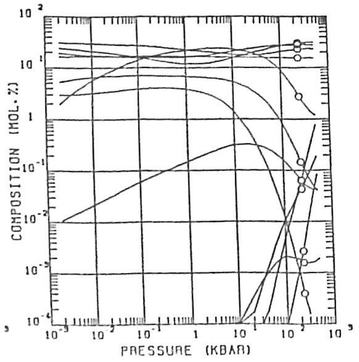
K-H-T ISENTROPE THRU C-J POINT











PETN50/TNT50PENTOLITE
RHO (G/CC) 1.650
E_0 (KCAL/MOLE) -23.24
D_{C-J}(M/SEC) 7464.
P_{C-J}(KBAR) 235.0
T_{C-J}(K) 3607.

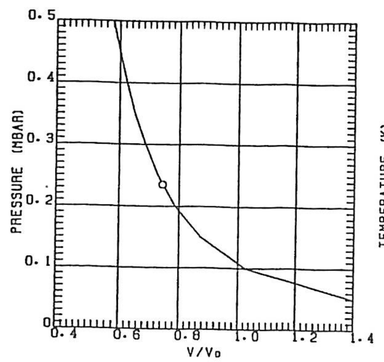
DATE 82-10-22

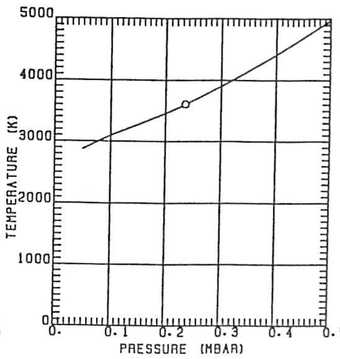
********** A K-H-T H U G O N I O T <<DATE 82-10-22>>**********

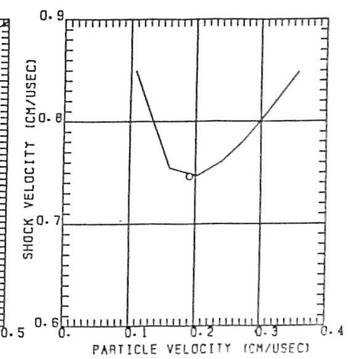
PETN50/TNT50PENTOLITE RHO = 1.6500 G/CC, EO = -2.324231E+04 CAL/MOLE

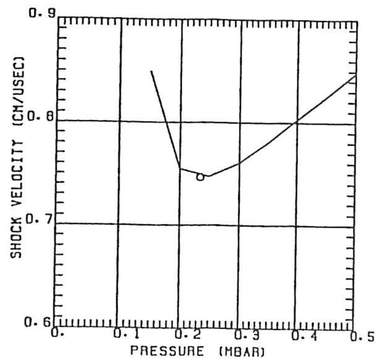
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3509	0.3636	0.3781	0.3950	0.4156	0.4417	0.4770	0.5297	0.6212	0.8473
TEMP (DEG K)	4976.2	4688.8	4413.5	4150.5	3902.0	3671.6	3462.6	3276.1	3100.7	2879.4
US (M/SEC)	8483.3	8256.3	8027.3	7804.3	7605.3	7474.4	7545.9	8492.1	0.0	0.0
UP (M/SEC)	3572.1	3303.3	3020.0	2718.0	2390.7	2027.1	1606.3	1070.5	0.0	0.0
H2O (MOLE)	1.1694	1.1717	1.1732	1.1741	1.1741	1.1728	1.1692	1.1597	1.1303	0.9986
CO2 (MOLE)	0.9512	0.9627	0.9704	0.9742	0.9737	0.9677	0.9524	0.9174	0.8338	0.6229
CO (MOLE)	0.0762	0.0735	0.0739	0.0777	0.0866	0.1048	0.1416	0.2228	0.4200	0.9740
N2 (MOLE)	0.6220	0.6295	0.6353	0.6395	0.6421	0.6436	0.6442	0.6440	0.6426	0.6388
H2 (MOLE)	0.0028	0.0028	0.0029	0.0033	0.0040	0.0054	0.0084	0.0160	0.0399	0.1451
O2 (MOLE)	0.0056	0.0034	0.0018	0.0009	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0027	0.0024	0.0022	0.0021	0.0022	0.0025	0.0031	0.0044	0.0075	0.0155
OH (MOLE)	0.0132	0.0097	0.0069	0.0047	0.0031	0.0021	0.0013	0.0009	0.0006	0.0003
H (MOLE)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.0079
NO (MOLE)	0.0464	0.0317	0.0202	0.0120	0.0066	0.0034	0.0016	0.0007	0.0002	0.0001
C(S) (MOLE)	1.3043	1.2955	1.2874	1.2798	1.2714	1.2593	1.2377	1.1915	1.0772	0.7269

K-H-T HUGONIOT









PETN50/TNT50PENTOLITE
RHO (G/CC) 1.650
E_0 (KCAL/MOLE) -23.24

DATE 82-10-22

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	COMP.A RDX 91/WAX 9	#HMX 29.7/NQ 64.9/EST 5.4	#COMP.B 60.7/TNT39.3	RDX#CYLCOTOL 77/TNT 23	RDX#HMX 90 ESTANE 10	#HMX 93.40 ESTANE 6.6	#HMX85.6/DATB# 9.2/ESTA5.2
RHO (G/CC)	1.631	1.712	1.730	1.754	1.767	1.800	1.798
EO (KCAL/MOLE)	2.43	-10.64	2.16	4.42	5.83	5.90	4.48
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000
C	1.8681	1.2990	2.0310	1.7488	1.7235	1.5967	1.6473
H	3.7718	3.7001	2.5048	2.5863	3.1780	3.0159	2.8899
N	2.4582	3.3075	2.1587	2.3838	2.4511	2.5361	2.5118
O	2.4582	2.1463	2.6778	2.6875	2.6104	2.6413	2.6325
DETN.VEL (M/SEC)	7933.1	8223.4	8003.8	8287.7	8454.2	8619.1	8541.0
PARTICL.VEL(")	1955.8	1914.1	1991.6	2072.0	2153.1	2142.5	2183.7
C-J PRESS (KBAR)	253.1	269.5	275.8	301.2	321.6	332.4	335.3
C-J VOLUME (CC/G)	0.46197	0.44815	0.43420	0.42759	0.42180	0.41745	0.41398
C-J TEMP (DEG K)	3249.4	2476.9	3513.0	3527.9	3426.0	3402.9	3414.1
C-J S(CAL/DEG MOL)	54.82	48.31	57.43	55.77	54.90	54.20	54.52
C-J ENERGY (CAL/G)	457.11	437.84	474.00	513.05	553.92	548.58	569.85
GAMMA	3.056	3.296	3.019	3.000	2.927	3.023	2.911
C-J DETN.HEAT(CAL)	1375.5	1101.5	1401.6	1435.0	1448.9	1455.9	1430.7
LAMDA	8.1011	8.0975	9.2315	9.1938	8.6671	8.8327	8.9232
VOLUM(K LITTRE/KG)	0.8359	0.8937	0.7514	0.7837	0.8165	0.8204	0.8087
TOTAL PRODCT(MOLE)	4.9789	4.8018	4.3627	4.2345	4.5382	4.3734	4.3490
V GAS (MOLES)	3.4169	3.6529	3.0715	3.2032	3.3375	3.3535	3.3056
V GAS (CC/MOLE)	12.0005	11.2624	12.7836	12.3543	11.5659	11.5583	11.6043
V SOL C(S) (CC/G)	0.27676	0.26631	0.26795	0.25717	0.24821	0.24366	0.24249
H2O (MOL %)	37.5790	38.4793	28.5277	30.3834	34.8812	34.3716	33.1219
CO2 (MOL %)	5.6037	3.0897	15.7860	16.0069	11.0186	12.7252	13.4124
CO (MOL %)	0.5440	0.0371	1.1710	0.9388	0.5002	0.4646	0.4727
N2 (MOL %)	24.6217	34.4280	24.6761	28.0746	26.9444	28.9352	28.8178
H2 (MOL %)	0.1348	0.0141	0.0797	0.0623	0.0498	0.0384	0.0357
O2 (MOL %)	0.0004	0.0000	0.0022	0.0030	0.0021	0.0024	0.0026
NH3 (MOL %)	0.1034	0.0231	0.0556	0.0507	0.0472	0.0392	0.0368
OH (MOL %)	0.0152	0.0007	0.0305	0.0321	0.0245	0.0230	0.0231
H (MOL %)	0.0006	0.0000	0.0008	0.0006	0.0004	0.0003	0.0003
CH4 (MOL %)	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000
NO (MOL %)	0.0241	0.0020	0.0737	0.0940	0.0736	0.0805	0.0845
C(S) (MOL %)	31.3729	23.9260	29.5966	24.3536	26.4579	23.3197	23.9921

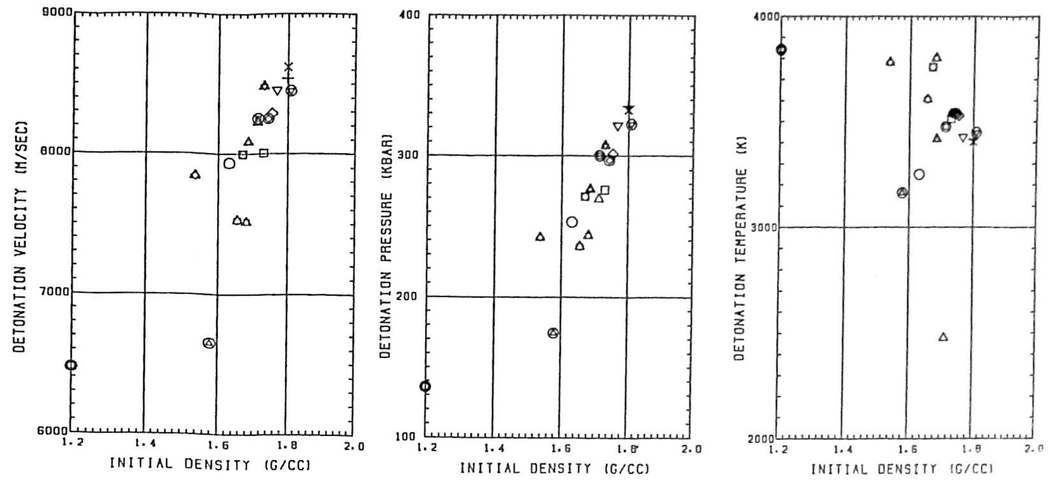
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	CYCLOTOL 75.2/TNT24.8	RDX#TNT 60.80 DNT 39.20	#RDX 93.9/STY 3.80/DOP2.3	#CYCLOTOL RDX77/TNT23	#OCTOL 76.3/TNT	HMX# PETN 54.7 23. TNT45.30	#RDX 92/STYR # 6/DOP 2
RHO (G/CC)	1.200	1.579	1.713	1.743	1.809	1.655	1.685
EO (KCAL/MOLE)	4.17	-6.35	7.15	4.42	3.13	-24.84	7.00
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000
C	1.7800	3.2728	1.7029	1.7488	1.7609	2.2612	1.8276
H	2.5773	2.5375	3.0307	2.5863	2.5828	2.3814	3.1219
N	2.3589	1.4026	2.5365	2.3838	2.3741	1.2904	2.4852
O	2.6865	2.4055	2.5603	2.6875	2.6871	3.2729	2.5059
DETN.VEL (M/SEC)	6472.9	6649.8	8251.8	8251.0	8448.7	7524.9	8082.8
PARTICL.VEL(")	1746.4	1662.4	2122.1	2063.9	2109.1	1892.1	2027.8
C-J PRESS (KBAR)	135.7	174.6	300.0	296.8	322.3	235.6	276.2
C-J VOLUME (CC/G)	0.60850	0.47499	0.43365	0.43021	0.41480	0.45230	0.44459
C-J TEMP (DEG K)	3841.1	3162.5	3475.3	3538.1	3447.5	3605.2	3416.1
C-J S(CAL/DEG MOL)	55.82	64.30	55.07	55.82	55.45	59.78	55.51
C-J ENERGY (CAL/G)	364.48	330.24	538.13	509.03	531.57	427.83	491.36
GAMMA	2.706	3.000	2.889	2.998	3.006	2.977	2.986
C-J DETN.HEAT(CAL)	1327.7	1184.6	1428.3	1434.4	1424.8	1391.5	1406.0
LAMDA	8.9851	8.8450	8.7542	9.1924	9.2021	9.7070	8.6303
VOLUM(K LITTRE/KG)	0.8440	0.6326	0.8131	0.7840	0.7805	0.7185	0.8063
TOTAL PRODCT(MOLE)	4.2291	5.2392	4.4861	4.2344	4.2404	4.0969	4.6296
V GAS (MOLES)	3.4497	2.5857	3.3235	3.2047	3.1904	2.9370	3.2956
V GAS (CC/MOLE)	16.7216	14.5079	11.9662	12.4247	12.0210	14.0428	12.1904
V SOL C(S) (CC/G)	0.33809	0.31335	0.25748	0.25907	0.24800	0.28612	0.26737
H2O (MOL %)	27.9609	23.8986	33.5978	30.3736	30.3488	28.7992	33.4990
CO2 (MOL %)	11.7971	10.1762	11.3232	15.9791	16.1344	24.0912	9.8870
CO (MOL %)	11.8330	1.6421	0.7203	1.0051	0.6330	2.7896	0.7757
N2 (MOL %)	27.6278	13.3418	28.2021	28.0740	27.9315	15.6840	26.7765
H2 (MOL %)	1.7000	0.1940	0.0729	0.0678	0.0386	0.1461	0.0949
O2 (MOL %)	0.0009	0.0002	0.0020	0.0029	0.0029	0.0028	0.0012
NH3 (MOL %)	0.4688	0.0780	0.0620	0.0537	0.0363	0.0628	0.0737
OH (MOL %)	0.0801	0.0104	0.0283	0.0332	0.0251	0.0443	0.0243
H (MOL %)	0.0198	0.0007	0.0006	0.0007	0.0004	0.0016	0.0007
CH4 (MOL %)	0.0283	0.0008	0.0001	0.0001	0.0000	0.0004	0.0001
NO (MOL %)	0.0533	0.0098	0.0744	0.0937	0.0886	0.0665	0.0530
C(S) (MOL %)	18.4301	50.6475	25.9162	24.3162	24.7604	28.3116	28.8140

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	HMX 90/ES 10 PBX 9011	#PBX-9205 RDX/STYLENE	#PBX-9501 HMX/BINDER	#EDC-11 HMX/RDX/BIND	#EDC-24 HMX 95/WAX 5	#LX-14 HMX 95/ES 5	#HBX-O RDX/TNT/WAX	#
RHO (G/CC)	1.767	1.690	1.841	1.782	1.776	1.810	1.620	
EO (KCAL/MOLE)	5.83	7.00	5.84	1.80	3.24	5.94	-1.65	
MOL.WEIGHT (G)	100.000	100.000	100.000	99.000	100.000	100.000	100.000	
C	1.7235	1.8276	1.4661	1.9140	1.6381	1.5370	2.4362	
H	3.1780	3.1219	2.8490	2.6432	3.2960	2.9396	3.0655	
N	2.4511	2.4852	2.6032	2.2331	2.5662	2.5762	1.9298	
O	2.6104	2.5059	2.6911	2.6293	2.5662	2.6558	2.5387	
DETN.VEL (M/SEC)	8457.1	8100.0	8820.7	8253.8	8514.9	8678.0	7443.2	
PARTICL.VEL(")	2135.0	2042.4	2201.9	2093.8	2142.9	2136.0	1935.9	
C-J PRESS (KBAR)	319.0	279.6	357.6	308.0	324.1	335.5	233.4	
C-J VOLUME (CC/G)	0.42306	0.44252	0.40759	0.41881	0.42136	0.41650	0.45673	
C-J TEMP (DEG K)	3418.9	3417.3	3412.4	3437.2	3285.0	3397.4	3374.4	
C-J S(CAL/DEG MOL)	54.88	55.50	53.57	56.36	53.81	53.90	59.02	
C-J ENERGY (CAL/G)	544.71	498.49	579.40	523.90	548.74	545.25	447.88	
GAMMA	2.961	2.966	3.006	2.942	2.974	3.063	2.845	
C-J DETN.HEAT(CAL)	1448.9	1406.3	1470.0	1401.4	1411.0	1459.1	1328.1	
LAMDA	8.6671	8.6306	9.0124	9.0898	8.5644	8.9099	8.5931	
VOLUM(K LITTRE/KG)	0.8166	0.8061	0.8241	0.7680	0.8315	0.8224	0.7417	
TOTAL PRODCT(MOLE)	4.5381	4.6298	4.1937	4.3526	4.5691	4.2958	4.9310	
V GAS (MOLES)	3.3378	3.2949	3.3683	3.1077	3.3986	3.3614	3.0315	
V GAS (CC/MOLE)	11.5985	12.1366	11.4140	12.1201	11.3779	11.5814	12.9132	
V SOL C(S) (CC/G)	0.24926	0.26591	0.23336	0.25396	0.24663	0.24236	0.28609	
H2O (MOL %)	34.8793	33.5061	33.8840	30.2430	35.9635	34.1134	30.7972	
CO2 (MOL %)	11.0169	9.8965	14.8770	14.6910	9.8927	13.5688	9.7497	
CO (MOL %)	0.5111	0.7469	0.4008	0.6795	0.3425	0.4617	1.1341	
N2 (MOL %)	26.9458	26.7763	30.9712	25.5947	28.0358	29.9244	19.5097	
H2 (MOL %)	0.0513	0.0903	0.0263	0.0470	0.0376	0.0353	0.1474	
O2 (MOL %)	0.0020	0.0013	0.0033	0.0023	0.0013	0.0025	0.0007	
NH3 (MOL %)	0.0481	0.0713	0.0306	0.0406	0.0392	0.0370	0.0851	
OH (MOL %)	0.0241	0.0243	0.0231	0.0244	0.0165	0.0227	0.0215	
H (MOL %)	0.0004	0.0007	0.0002	0.0004	0.0002	0.0003	0.0009	
CH4 (MOL %)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0003	
NO (MOL %)	0.0713	0.0542	0.1013	0.0744	0.0534	0.0841	0.0315	
C(S) (MOL %)	26.4496	28.8321	19.6823	28.6027	25.6172	21.7500	38.5221	

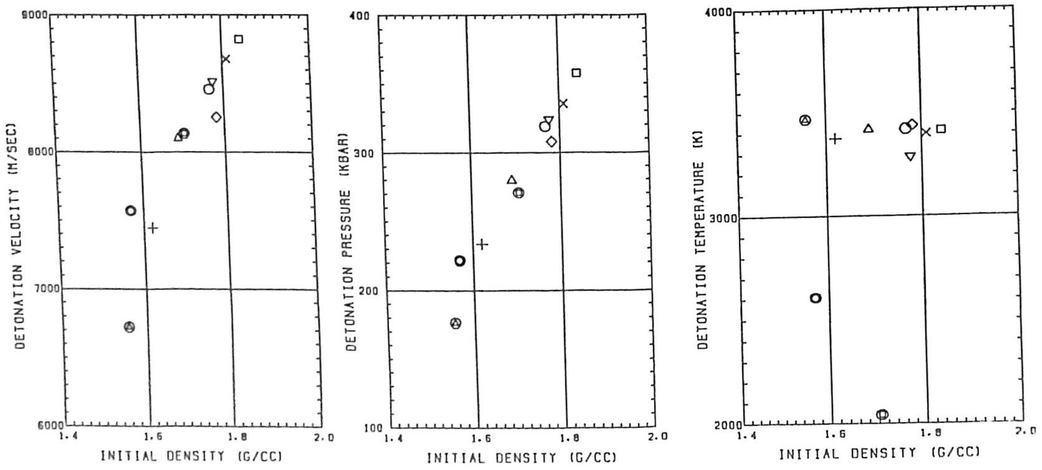
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES		NQ/HMX/ESTAN#PYX/POLYETHY#NQ 95/ES 5 # 61/21/18 95/5		
RHO	(G/CC)	1.570	1.556	1.705
EO	(KCAL/MOLE)	-9.91	3.20	-18.32
MOL.WEIGHT	(G)	100.000	100.000	100.000
C		1.7840	2.9558	1.1668
H		4.2563	1.7832	4.0249
N		2.9477	1.6819	3.6614
O		2.0622	2.4464	1.9153
DETN.VEL	(M/SEC)	7568.4	6721.2	8135.8
PARTICL.VEL(	")	1865.6	1686.9	1952.0
C-J PRESS	(KBAR)	221.7	176.4	270.8
C-J VOLUME	(CC/G)	0.47994	0.48137	0.44579
C-J TEMP	(DEG K)	2608.7	3469.0	2042.0
C-J S	(CAL/DEG MOL)	50.95	63.70	45.28
C-J ENERGY	(CAL/G)	415.94	340.08	455.36
GAMMA		3.057	2.984	3.168
C-J DETN.HEAT	(CAL)	1095.7	1241.6	930.6
LAMDA		7.6379	9.6590	7.9074
VOLUM	(K LITTRE/KG)	0.8730	0.6353	0.9250
TOTAL PRODCT	(MOLE)	5.3461	4.6857	4.9477
V GAS	(MOLES)	3.5683	2.5967	3.7809
V GAS	(CC/MOLE)	11.7265	15.5048	10.8122
V SOL C(S)	(CC/G)	0.28805	0.31394	0.26394
H2O	(MOL %)	38.3666	18.6620	38.7097
CO2	(MOL %)	0.0931	14.9988	0.0014
CO	(MOL %)	0.0209	3.4982	0.0001
N2	(MOL %)	27.1967	17.8920	36.3720
H2	(MOL %)	0.3218	0.2275	0.0770
O2	(MOL %)	0.0000	0.0006	0.0000
NH3	(MOL %)	0.7441	0.0827	1.2584
OH	(MOL %)	0.0006	0.0236	0.0000
H	(MOL %)	0.0001	0.0018	0.0000
CH4	(MOL %)	0.0012	0.0011	0.0001
NO	(MOL %)	0.0004	0.0284	0.0000
C(S)	(MOL %)	33.2545	44.5834	23.5812

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

HMX 90/ES 10 PBX 9011 RHO = 1.7670 G/CC EO = 5.834977E+03 CAL/MOLE

LN P = -3.50347137 E+00 -2.44241238 E+00LN V 3.22132528 E-01LN V*2 -3.06530893 E-02LN V*3 7.66669633 E-04LN V*4

LN T = 7.68344498 E+00 -4.53115702 E-01LN V 1.22349381 E-01LN V*2 -1.86520480 E-02LN V*3 9.49751586 E-04LN V*4

LN E = -1.63150883 E+00 4.62335825 E-01LNP 7.07160234 E-02LN P*2 5.37500903 E-03LN P*3 1.51988730 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (650.211)	0.3375	4345.4 (4209.6)	-1484.1	0.16209 (0.15725)	3.2545	584.8
500.000 (517.960)	0.3622	3989.2 (3985.2)	-1140.5	0.14772 (0.14664)	3.1948	1085.5
400.000 (404.356)	0.3917	3673.6 (3758.2)	-814.2	0.13407 (0.13536)	3.1296	1631.1
* 319.046 (318.490)	0.4231	3418.9 (3555.1)	-544.6	0.12279 (0.12554)	3.0666	2135.0
300.000 (297.602)	0.4326	3389.8 (3500.1)	-494.8	0.12070 (0.12311)	3.0487	2275.8
200.000 (192.975)	0.5000	3182.7 (3174.1)	-201.2	0.10842 (0.10928)	2.9342	3112.3
100.000 (95.267)	0.6411	2800.1 (2726.5)	179.7	0.09248 (0.09232)	2.7473	4273.8
80.000 (76.329)	0.6955	2676.0 (2604.5)	276.5	0.08843 (0.08817)	2.6886	4594.6
60.000 (57.509)	0.7739	2519.0 (2460.0)	386.8	0.08382 (0.08352)	2.6136	4978.0
50.000 (48.131)	0.8290	2423.1 (2375.3)	448.8	0.08122 (0.08093)	2.5665	5205.0
40.000 (38.753)	0.9029	2310.9 (2278.0)	517.4	0.07835 (0.07809)	2.5092	5468.0
30.000 (29.051)	1.0146	2178.2 (2158.0)	594.1	0.07514 (0.07487)	2.4331	5796.6
20.000 (19.750)	1.1930	2007.6 (2012.6)	686.3	0.07129 (0.07107)	2.3316	6202.5
10.000 (10.171)	1.6035	1772.7 (1798.7)	807.3	0.06622 (0.06604)	2.1584	6822.6
8.000 (8.212)	1.7730	1709.1 (1738.3)	840.1	0.06485 (0.06472)	2.1030	7004.6
6.000 (6.209)	2.0298	1636.5 (1665.0)	877.3	0.06330 (0.06319)	2.0313	7231.0
5.000 (5.191)	2.2191	1594.9 (1621.2)	898.6	0.06240 (0.06231)	1.9857	7369.6
4.000 (4.156)	2.4860	1548.9 (1570.0)	922.0	0.06143 (0.06130)	1.9296	7535.6
3.000 (3.117)	2.8938	1493.0 (1508.6)	951.2	0.06020 (0.06011)	1.8580	7741.0
2.000 (2.068)	3.6314	1422.3 (1429.7)	988.6	0.05864 (0.05860)	1.7579	8017.8
1.000 (1.019)	5.5439	1318.1 (1313.9)	1045.1	0.05627 (0.05633)	1.5933	8458.7
0.800 (0.811)	6.4148	1288.1 (1281.1)	1061.7	0.05558 (0.05566)	1.5430	8593.2
0.600 (0.603)	7.7975	1250.8 (1241.7)	1082.4	0.05471 (0.05482)	1.4805	8761.9
0.500 (0.501)	8.8620	1228.0 (1218.1)	1095.1	0.05418 (0.05430)	1.4427	8866.5
0.400 (0.398)	10.4137	1200.7 (1190.5)	1110.4	0.05354 (0.05368)	1.3982	8992.3
0.300 (0.296)	12.9176	1166.3 (1156.7)	1129.7	0.05273 (0.05289)	1.3446	9151.5
0.200 (0.196)	17.7352	1119.0 (1111.7)	1156.2	0.05162 (0.05179)	1.2773	9370.3
0.100 (0.097)	31.3440	1039.9 (1038.7)	1199.9	0.04980 (0.04995)	1.1889	9729.6
0.080 (0.078)	37.8486	1015.2 (1015.5)	1213.2	0.04924 (0.04937)	1.1684	9841.6
0.060 (0.059)	48.3503	983.5 (985.6)	1230.0	0.04853 (0.04862)	1.1480	9983.1
0.050 (0.049)	56.5059	963.5 (966.4)	1240.5	0.04810 (0.04816)	1.1386	10071.3
0.040 (0.039)	68.4230	939.2 (942.8)	1252.9	0.04758 (0.04759)	1.1306	10177.8
0.030 (0.030)	87.5964	908.1 (911.9)	1268.4	0.04693 (0.04689)	1.1261	10313.0
0.020 (0.020)	124.0439	864.5 (867.6)	1289.3	0.04606 (0.04593)	1.1301	10499.8
0.010 (0.010)	223.7337	789.0 (790.9)	1322.9	0.04465 (0.04446)	1.1629	10809.0
0.008 (0.008)	270.9729	766.7 (765.8)	1332.0	0.04427 (0.04404)	1.1800	10907.5
0.006 (0.006)	345.5632	736.1 (734.2)	1344.2	0.04376 (0.04356)	1.2060	11031.3
0.005 (0.005)	402.3049	715.8 (714.7)	1352.0	0.04343 (0.04328)	1.2246	11107.9
0.004 (0.004)	485.2053	692.3 (691.0)	1360.7	0.04307 (0.04299)	1.2498	11201.3
0.003 (0.003)	617.1177	662.2 (661.3)	1371.5	0.04262 (0.04268)	1.2858	11319.5
0.002 (0.002)	864.5085	620.5 (621.7)	1385.6	0.04202 (0.04242)	1.3425	11481.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

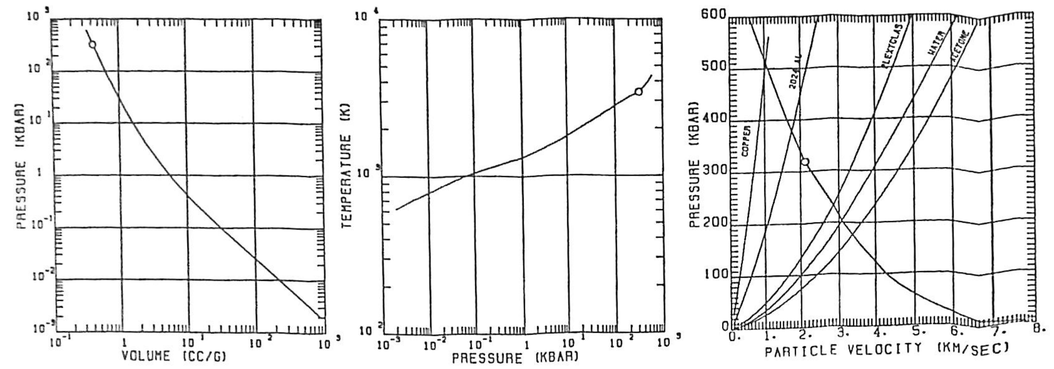
HMX 90/ES 10 PBX 9011 RHO = 1.7670 G/CC EO = 5.834977E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
319.046	1.58284	0.49994	0.02321	1.22282	0.00233	0.00009	0.00219	0.00109	0.00002	0.00000	0.00323	1.20030
300.000	1.58189	0.49881	0.02702	1.22292	0.00286	0.00007	0.00248	0.00104	0.00002	0.00000	0.00274	1.19762
200.000	1.57100	0.48622	0.06546	1.22244	0.00961	0.00001	0.00533	0.00066	0.00004	0.00003	0.00085	1.17174
100.000	1.52236	0.45045	0.18685	1.21844	0.04402	0.00000	0.01408	0.00020	0.00005	0.00070	0.00009	1.08547
80.000	1.49611	0.43927	0.23565	1.21672	0.06325	0.00000	0.01757	0.00012	0.00005	0.00160	0.00004	1.04696
60.000	1.45429	0.42830	0.29949	1.21451	0.09341	0.00000	0.02202	0.00006	0.00004	0.00412	0.00002	0.99156
50.000	1.42347	0.42419	0.33853	1.21324	0.11472	0.00000	0.02458	0.00004	0.00003	0.00696	0.00001	0.95380
40.000	1.38167	0.42271	0.38330	1.21192	0.14186	0.00000	0.02721	0.00002	0.00002	0.01232	0.00000	0.90514
30.000	1.32416	0.42670	0.43290	1.21087	0.17571	0.00000	0.02932	0.00001	0.00002	0.02258	0.00000	0.84131
20.000	1.23105	0.44363	0.49217	1.21027	0.21821	0.00000	0.03052	0.00000	0.00001	0.04698	0.00000	0.74069
10.000	1.06875	0.49490	0.55189	1.21183	0.26293	0.00000	0.02740	0.00000	0.00000	0.10811	0.00000	0.56857
8.000	1.02219	0.51527	0.55771	1.21272	0.26941	0.00000	0.02562	0.00000	0.00000	0.12949	0.00000	0.52100
6.000	0.96625	0.54151	0.56115	1.21393	0.27519	0.00000	0.02321	0.00000	0.00000	0.15638	0.00000	0.46442
5.000	0.93431	0.55799	0.56015	1.21469	0.27745	0.00000	0.02169	0.00000	0.00000	0.17236	0.00000	0.43297
4.000	0.89825	0.57702	0.55814	1.21558	0.27992	0.00000	0.01990	0.00000	0.00000	0.19050	0.00000	0.39780
3.000	0.86032	0.60191	0.54631	1.21667	0.28040	0.00000	0.01772	0.00000	0.00000	0.21086	0.00000	0.36440
2.000	0.81866	0.63549	0.52140	1.21803	0.27939	0.00000	0.01502	0.00000	0.00000	0.23423	0.00000	0.33264
1.000	0.77399	0.68707	0.46233	1.21987	0.27503	0.00000	0.01133	0.00000	0.00000	0.26150	0.00000	0.31256
0.800	0.76532	0.70228	0.44058	1.22035	0.27331	0.00000	0.01037	0.00000	0.00000	0.26742	0.00000	0.31317
0.600	0.75792	0.72103	0.41048	1.22091	0.27071	0.00000	0.00924	0.00000	0.00000	0.27326	0.00000	0.31866
0.500	0.75530	0.73239	0.39038	1.22124	0.26884	0.00000	0.00860	0.00000	0.00000	0.27599	0.00000	0.32469
0.400	0.75408	0.74559	0.36520	1.22160	0.26638	0.00000	0.00786	0.00000	0.00000	0.27838	0.00000	0.33426
0.300	0.75565	0.76157	0.33168	1.22203	0.26278	0.00000	0.00700	0.00000	0.00000	0.28005	0.00000	0.35014
0.200	0.76327	0.78195	0.28331	1.22257	0.25656	0.00000	0.00593	0.00000	0.00000	0.28014	0.00000	0.37804
0.100	0.78800	0.81018	0.20212	1.22332	0.24166	0.00000	0.00443	0.00000	0.00000	0.27636	0.00000	0.43481
0.080	0.79808	0.81716	0.17810	1.22352	0.23578	0.00000	0.00403	0.00000	0.00000	0.27456	0.00000	0.45361
0.060	0.81258	0.82464	0.14864	1.22376	0.22686	0.00000	0.00355	0.00000	0.00000	0.27213	0.00000	0.47803
0.050	0.82249	0.82845	0.13110	1.22390	0.22043	0.00000	0.00328	0.00000	0.00000	0.27059	0.00000	0.49332
0.040	0.83524	0.83201	0.11124	1.22406	0.21192	0.00000	0.00297	0.00000	0.00000	0.26871	0.00000	0.51151
0.030	0.85273	0.83482	0.08815	1.22424	0.19970	0.00000	0.00260	0.00000	0.00000	0.26635	0.00000	0.53415
0.020	0.87943	0.83522	0.06066	1.22446	0.18009	0.00000	0.00215	0.00000	0.00000	0.26314	0.00000	0.56444
0.010	0.93222	0.82567	0.02698	1.22478	0.13969	0.00000	0.00152	0.00000	0.00000	0.25742	0.00000	0.61339
0.008	0.94892	0.82058	0.02046	1.22486	0.12798	0.00000	0.00136	0.00000	0.00000	0.25505	0.00000	0.62735
0.006	0.97347	0.81186	0.01337	1.22496	0.11055	0.00000	0.00116	0.00000	0.00000	0.25164	0.00000	0.64659
0.005	0.99082	0.80499	0.00975	1.22502	0.09857	0.00000	0.00104	0.00000	0.00000	0.24904	0.00000	0.65967
0.004	1.01141	0.79627	0.00662	1.22509	0.08561	0.00000	0.00092	0.00000	0.00000	0.24532	0.00000	0.67525
0.003	1.03916	0.78379	0.00383	1.22516	0.06975	0.00000	0.00077	0.00000	0.00000	0.23949	0.00000	0.69635
0.002	1.08035	0.76432	0.00160	1.22526	0.04987	0.00000	0.00058	0.00000	0.00000	0.22897	0.00000	0.72856
400.000	1.58396	0.49953	0.01724	1.22079	0.00146	0.00030	0.00178	0.00182	0.00002	0.00000	0.00770	1.20668
500.000	1.58385	0.49504	0.01449	1.21607	0.00106	0.00088	0.00172	0.00302	0.00002	0.00000	0.01719	1.21392
600.000	1.58209	0.48724	0.01603	1.20941	0.00106	0.00163	0.00235	0.00463	0.00004	0.00000	0.02990	1.22018

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



	HMX 90/ES 10	PBX 9011
RHO (G/CC)	1.767	
E_0 (KCAL/MOLE)	5.83	
D_{C-J}(M/SEC)	8457.	
P_{C-J}(KBAR)	319.0	
T_{C-J}(K)	3419.	

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PBX-9205 RDX/STYLENE RHO = 1.6900 G/CC EO = 7.000715E+03 CAL/MOLE

LN P = -3.50466919 E+00 -2.43839455 E+00LN V 3.22889924 E-01LN V*2 -3.09859626 E-02LN V*3 8.08809185 E-04LN V*4

LN T = 7.70083904 E+00 -4.63327527 E-01LN V 1.30331337 E-01LN V*2 -2.04732455 E-02LN V*3 1.09558203 E-03LN V*4

LN E = -1.59876633 E+00 4.68424559 E-01LNP 7.31964707 E-02LN P*2 5.63441589 E-03LN P*3 1.60690848 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (654.184)	0.3365	4566.2 (4394.7)	-1613.2	0.16750 (0.16208)	3.2563	199.0
500.000 (518.448)	0.3616	4173.5 (4145.1)	-1252.1	0.15239 (0.15105)	3.1948	707.1
400.000 (403.041)	0.3916	3828.8 (3895.1)	-912.0	0.13816 (0.13935)	3.1282	1259.4
300.000 (297.444)	0.4321	3489.4 (3619.3)	-570.7	0.12388 (0.12668)	3.0476	1896.5
* 279.581 (276.622)	0.4425	3417.3 (3557.3)	-498.3	0.12085 (0.12392)	3.0284	2042.4
200.000 (193.354)	0.4990	3244.0 (3271.4)	-262.8	0.11100 (0.11242)	2.9333	2726.4
100.000 (95.370)	0.6401	2852.7 (2794.2)	117.3	0.09509 (0.09503)	2.7452	3889.6
80.000 (76.401)	0.6946	2725.9 (2665.1)	214.0	0.09105 (0.09079)	2.6862	4210.7
60.000 (57.560)	0.7730	2565.0 (2512.7)	324.6	0.08642 (0.08606)	2.6109	4594.3
50.000 (48.173)	0.8281	2466.7 (2423.6)	386.9	0.08381 (0.08344)	2.5636	4821.5
40.000 (38.782)	0.9020	2351.9 (2321.6)	455.7	0.08093 (0.08055)	2.5060	5084.7
30.000 (29.032)	1.0144	2216.1 (2195.7)	532.6	0.07771 (0.07731)	2.4292	5415.0
20.000 (19.743)	1.1929	2041.8 (2044.8)	625.3	0.07384 (0.07348)	2.3273	5820.8
10.000 (10.177)	1.6038	1801.7 (1824.3)	747.5	0.06873 (0.06845)	2.1538	6440.8
8.000 (8.211)	1.7742	1737.7 (1762.2)	779.9	0.06737 (0.06714)	2.0981	6623.6
6.000 (6.207)	2.0321	1663.9 (1687.2)	817.1	0.06581 (0.06562)	2.0261	6850.4
5.000 (5.190)	2.2219	1621.4 (1642.6)	838.7	0.06491 (0.06475)	1.9804	6989.2
4.000 (4.162)	2.4877	1573.0 (1590.9)	863.5	0.06387 (0.06375)	1.9246	7154.3
3.000 (3.117)	2.8997	1517.5 (1528.4)	891.8	0.06269 (0.06258)	1.8524	7361.4
2.000 (2.068)	3.6415	1445.6 (1448.9)	929.5	0.06111 (0.06108)	1.7521	7638.9
1.000 (1.019)	5.5676	1339.9 (1333.3)	986.5	0.05872 (0.05883)	1.5873	8081.4
0.800 (0.810)	6.4457	1309.4 (1300.8)	1003.2	0.05802 (0.05816)	1.5369	8216.4
0.600 (0.603)	7.8413	1271.7 (1261.8)	1024.1	0.05715 (0.05732)	1.4745	8385.9
0.500 (0.500)	8.9170	1248.6 (1238.5)	1037.1	0.05661 (0.05680)	1.4366	8491.0
0.400 (0.398)	10.4860	1221.1 (1211.3)	1052.5	0.05596 (0.05617)	1.3922	8617.6
0.300 (0.296)	13.0204	1186.4 (1178.1)	1072.0	0.05515 (0.05536)	1.3386	8777.7
0.200 (0.196)	17.9026	1138.8 (1133.7)	1098.9	0.05402 (0.05425)	1.2714	8997.9
0.100 (0.097)	31.7166	1059.9 (1061.4)	1143.2	0.05217 (0.05235)	1.1832	9359.8
0.080 (0.078)	38.3278	1035.3 (1038.3)	1156.8	0.05160 (0.05175)	1.1628	9472.6
0.060 (0.059)	49.0122	1003.9 (1008.4)	1173.9	0.05088 (0.05098)	1.1424	9615.3
0.050 (0.049)	57.3184	984.2 (989.3)	1184.5	0.05044 (0.05050)	1.1329	9704.3
0.040 (0.039)	69.4687	960.3 (965.6)	1197.2	0.04991 (0.04991)	1.1248	9811.9
0.030 (0.030)	89.0452	929.8 (934.6)	1213.0	0.04925 (0.04918)	1.1200	9948.5
0.020 (0.020)	126.3468	887.2 (890.3)	1234.3	0.04836 (0.04819)	1.1236	10137.6
0.010 (0.010)	229.2701	815.1 (813.7)	1268.1	0.04694 (0.04667)	1.1551	10452.1
0.008 (0.008)	277.5566	792.1 (789.4)	1278.2	0.04652 (0.04624)	1.1714	10551.3
0.006 (0.006)	354.7207	762.4 (758.6)	1290.7	0.04600 (0.04575)	1.1965	10677.3
0.005 (0.005)	413.2944	742.4 (739.9)	1299.0	0.04565 (0.04548)	1.2143	10754.9
0.004 (0.004)	499.3142	719.5 (717.3)	1308.1	0.04527 (0.04519)	1.2386	10850.1
0.003 (0.003)	636.4802	690.2 (689.5)	1319.2	0.04480 (0.04490)	1.2732	10970.6
0.002 (0.002)	894.5991	649.4 (653.5)	1334.0	0.04419 (0.04467)	1.3276	11135.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

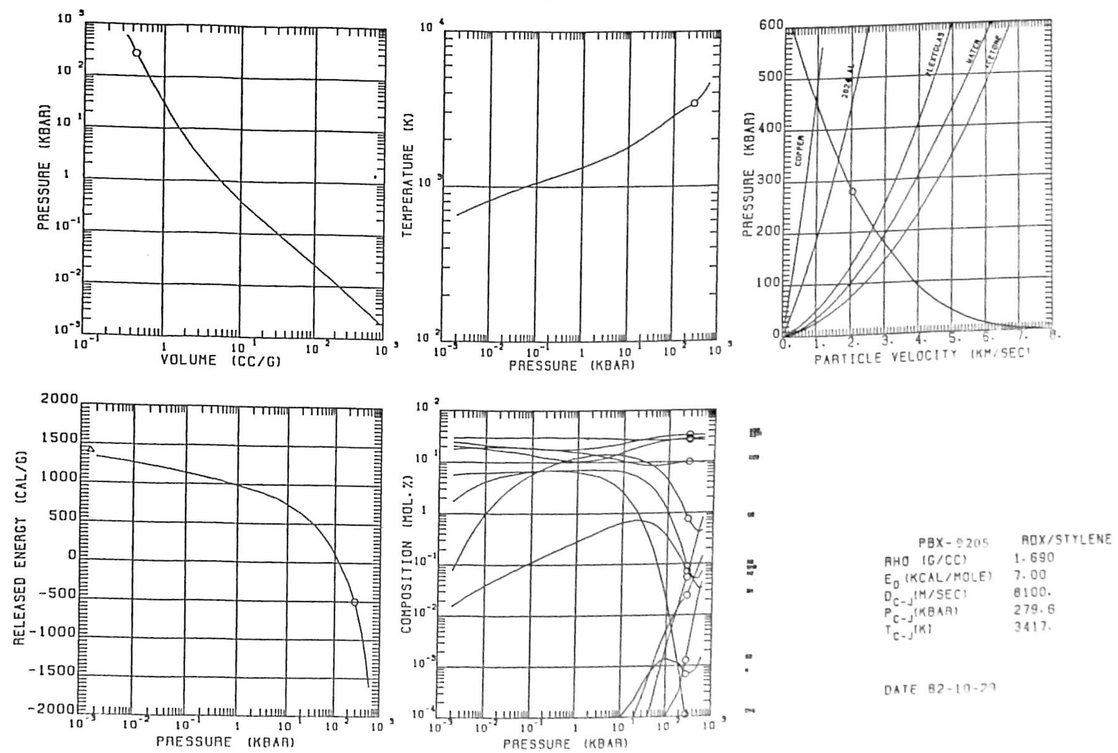
PBX-9205 RDX/STYLENE RHO = 1.6900 G/CC EO = 7.000715E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
279.581	1.55123	0.45815	0.03464	1.23968	0.00419	0.00006	0.00331	0.00112	0.00003	0.00000	0.00251	1.33483
200.000	1.54023	0.44679	0.07035	1.23903	0.01107	0.00001	0.00613	0.00077	0.00005	0.00003	0.00097	1.31045
100.000	1.48584	0.41116	0.19742	1.23461	0.04952	0.00000	0.01585	0.00024	0.00006	0.00085	0.00011	1.21819
80.000	1.45683	0.40031	0.24825	1.23273	0.07072	0.00000	0.01965	0.00015	0.00006	0.00193	0.00005	1.17713
60.000	1.41121	0.39005	0.31452	1.23039	0.10349	0.00000	0.02436	0.00007	0.00005	0.00483	0.00002	1.11821
50.000	1.37797	0.38640	0.35509	1.22908	0.12638	0.00000	0.02700	0.00005	0.00004	0.00804	0.00001	1.07811
40.000	1.33330	0.38536	0.40186	1.22777	0.15522	0.00000	0.02962	0.00003	0.00003	0.01400	0.00000	1.02643
30.000	1.27274	0.38959	0.45398	1.22680	0.19071	0.00000	0.03156	0.00001	0.00002	0.02509	0.00000	0.95897
20.000	1.17654	0.40608	0.51722	1.22641	0.23445	0.00000	0.03235	0.00000	0.00001	0.05073	0.00000	0.85362
10.000	1.01459	0.45467	0.58204	1.22835	0.27894	0.00000	0.02847	0.00000	0.00000	0.11237	0.00000	0.67856
8.000	0.96831	0.47336	0.59095	1.22932	0.28579	0.00000	0.02652	0.00000	0.00000	0.13354	0.00000	0.62979
6.000	0.91395	0.49773	0.59659	1.23062	0.29151	0.00000	0.02393	0.00000	0.00000	0.15981	0.00000	0.57352
5.000	0.88337	0.51311	0.59632	1.23143	0.29361	0.00000	0.02231	0.00000	0.00000	0.17527	0.00000	0.54295
4.000	0.85031	0.53184	0.59192	1.23238	0.29491	0.00000	0.02041	0.00000	0.00000	0.19258	0.00000	0.51131
3.000	0.81289	0.55432	0.58439	1.23351	0.29643	0.00000	0.01815	0.00000	0.00000	0.21221	0.00000	0.47672
2.000	0.77354	0.58584	0.56069	1.23491	0.29556	0.00000	0.01535	0.00000	0.00000	0.23442	0.00000	0.44667
1.000	0.73181	0.63578	0.50255	1.23680	0.29172	0.00000	0.01157	0.00000	0.00000	0.26005	0.00000	0.42926
0.800	0.72382	0.65067	0.48075	1.23730	0.29026	0.00000	0.01058	0.00000	0.00000	0.26552	0.00000	0.43069
0.600	0.71718	0.66917	0.45040	1.23787	0.28802	0.00000	0.00943	0.00000	0.00000	0.27081	0.00000	0.43724
0.500	0.71494	0.68047	0.43006	1.23820	0.28644	0.00000	0.00877	0.00000	0.00000	0.27322	0.00000	0.44386
0.400	0.71411	0.69373	0.40437	1.23858	0.28437	0.00000	0.00802	0.00000	0.00000	0.27524	0.00000	0.45428
0.300	0.71597	0.70998	0.37000	1.23902	0.28134	0.00000	0.00715	0.00000	0.00000	0.27648	0.00000	0.47115
0.200	0.72368	0.73111	0.32005	1.23956	0.27611	0.00000	0.00606	0.00000	0.00000	0.27606	0.00000	0.50041
0.100	0.74765	0.76161	0.23508	1.24032	0.26333	0.00000	0.00453	0.00000	0.00000	0.27160	0.00000	0.55931
0.080	0.75727	0.76955	0.20959	1.24053	0.25825	0.00000	0.00412	0.00000	0.00000	0.26964	0.00000	0.57883
0.060	0.77097	0.77849	0.17801	1.24077	0.25042	0.00000	0.00364	0.00000	0.00000	0.26707	0.00000	0.60406
0.050	0.78032	0.78331	0.15901	1.24091	0.24471	0.00000	0.00336	0.00000	0.00000	0.26545	0.00000	0.61981
0.040	0.79227	0.78822	0.13726	1.24107	0.23711	0.00000	0.00305	0.00000	0.00000	0.26351	0.00000	0.63863
0.030	0.80862	0.79290	0.11154	1.24125	0.22605	0.00000	0.00268	0.00000	0.00000	0.26114	0.00000	0.66205
0.020	0.83344	0.79622	0.08010	1.24148	0.20797	0.00000	0.00223	0.00000	0.00000	0.25811	0.00000	0.69319
0.010	0.88114	0.79241	0.04004	1.24179	0.17073	0.00000	0.00161	0.00000	0.00000	0.25336	0.00000	0.74182
0.008	0.89774	0.78870	0.03085	1.24188	0.15760	0.00000	0.00144	0.00000	0.00000	0.25174	0.00000	0.75632
0.006	0.92054	0.78210	0.02127	1.24198	0.13983	0.00000	0.00124	0.00000	0.00000	0.24938	0.00000	0.77486
0.005	0.93707	0.77646	0.01604	1.24203	0.12677	0.00000	0.00113	0.00000	0.00000	0.24774	0.00000	0.78740
0.004	0.95618	0.76921	0.01143	1.24210	0.11285	0.00000	0.00100	0.00000	0.00000	0.24524	0.00000	0.80174
0.003	0.98201	0.75847	0.00708	1.24218	0.09520	0.00000	0.00085	0.00000	0.00000	0.24126	0.00000	0.82083
0.002	1.02034	0.74120	0.00331	1.24227	0.07198	0.00000	0.00066	0.00000	0.00000	0.23384	0.00000	0.84927
300.000	1.55209	0.45882	0.03141	1.23941	0.00361	0.00009	0.00306	0.00132	0.00003	0.00000	0.00329	1.33739
400.000	1.55397	0.45837	0.02222	1.23655	0.00209	0.00039	0.00243	0.00251	0.00004	0.00000	0.00965	1.34703
500.000	1.55369	0.45271	0.01898	1.23070	0.00156	0.00111	0.00240	0.00420	0.00004	0.00000	0.02135	1.35593
600.000	1.55108	0.44291	0.02123	1.22239	0.00161	0.00207	0.00332	0.00652	0.00007	0.00000	0.03707	1.36348

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



	PBX-9205	RDX/STYLENE
RHO (G/CC)	1.690	
E_0 (KCAL/MOLE)	7.00	
D_{C-J}(M/SEC)	8100.	
P_{C-J}(KBAR)	279.6	
T_{C-J}(K)	3417.	

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PBX-9501 HMX/BINDER RHO = 1.8410 G/CC EO = 5.838258E+03 CAL/MOLE

LN P = -3.51161861 E+00 -2.46063995 E+00LN V 3.26731563 E-01LN V*2 -3.12275290 E-02LN V*3 7.53790839 E-04LN V*4

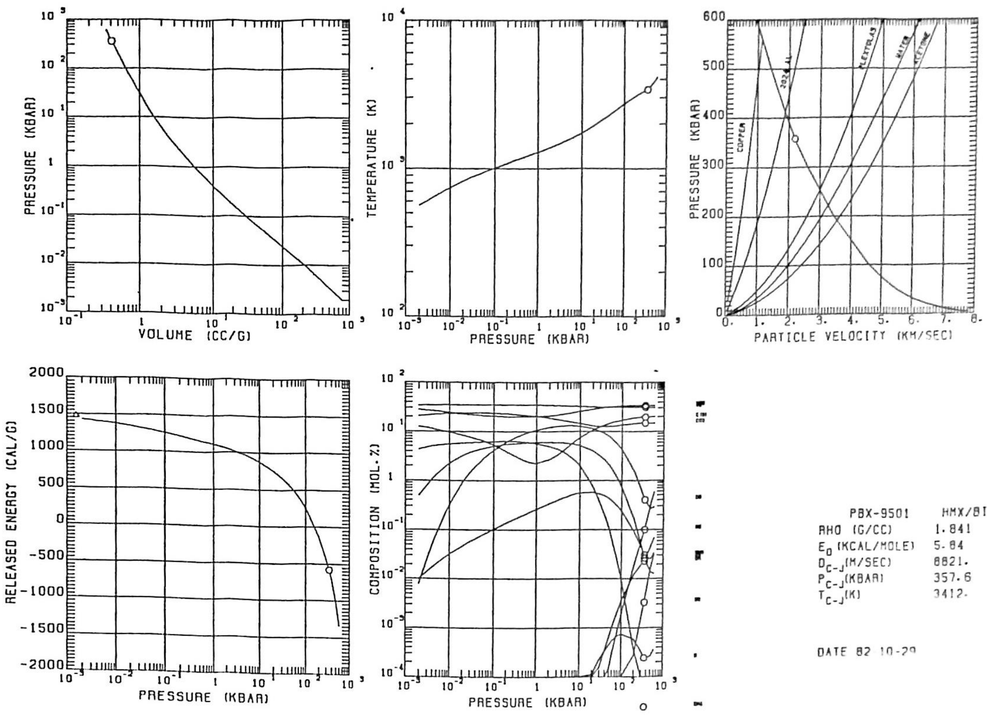
LN T = 7.65691853 E+00 -4.49159563 E-01LN V 1.19112849 E-01LN V*2 -1.81139000 E-02LN V*3 8.83019529 E-04LN V*4

LN E = -1.66192913 E+00 4.62757945 E-01LNP 6.96806908 E-02LN P*2 5.23415208 E-03LN P*3 1.46955819 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (638.576)	0.3412	4113.6 (4028.8)	-1338.6	0.15601 (0.15246)	3.2753	933.7
500.000 (516.474)	0.3643	3811.1 (3833.4)	-1023.1	0.14281 (0.14214)	3.2191	1416.6
400.000 (406.506)	0.3927	3533.5 (3627.4)	-714.1	0.12988 (0.13116)	3.1557	1950.6
* 357.569 (361.585)	0.4076	3412.4 (3531.9)	-578.7	0.12421 (0.12623)	3.1247	2201.9
300.000 (298.612)	0.4336	3325.3 (3382.7)	-428.0	0.11791 (0.11921)	3.0739	2605.9
200.000 (194.111)	0.5001	3111.7 (3076.5)	-128.0	0.10535 (0.10571)	2.9594	3436.7
100.000 (95.466)	0.6408	2727.4 (2649.3)	256.8	0.08925 (0.08912)	2.7703	4601.8
80.000 (76.388)	0.6951	2604.9 (2532.4)	353.5	0.08521 (0.08505)	2.7108	4923.3
60.000 (57.462)	0.7732	2451.2 (2393.8)	463.0	0.08063 (0.08049)	2.6349	5307.2
50.000 (48.053)	0.8280	2358.1 (2312.4)	524.3	0.07806 (0.07794)	2.5873	5534.1
40.000 (38.660)	0.9015	2249.4 (2219.0)	591.9	0.07524 (0.07515)	2.5294	5796.5
30.000 (29.072)	1.0108	2121.3 (2105.1)	667.3	0.07208 (0.07199)	2.4536	6119.6
20.000 (19.731)	1.1878	1957.1 (1964.6)	757.3	0.06831 (0.06823)	2.3509	6524.7
10.000 (10.170)	1.5920	1728.6 (1758.2)	876.5	0.06333 (0.06327)	2.1767	7139.5
8.000 (8.202)	1.7597	1668.3 (1699.3)	907.4	0.06203 (0.06197)	2.1207	7321.0
6.000 (6.191)	2.0139	1599.6 (1627.6)	942.1	0.06058 (0.06046)	2.0480	7546.6
5.000 (5.178)	2.1998	1558.9 (1585.0)	963.0	0.05971 (0.05958)	2.0022	7683.7
4.000 (4.153)	2.4598	1512.6 (1535.3)	986.9	0.05871 (0.05859)	1.9462	7846.7
3.000 (3.115)	2.8594	1457.8 (1475.2)	1015.3	0.05752 (0.05742)	1.8740	8049.9
2.000 (2.070)	3.5779	1387.5 (1397.9)	1052.5	0.05596 (0.05593)	1.7736	8322.6
1.000 (1.019)	5.4450	1285.6 (1283.0)	1106.8	0.05369 (0.05370)	1.6076	8758.8
0.800 (0.810)	6.2927	1255.9 (1250.3)	1122.7	0.05302 (0.05305)	1.5569	8891.4
0.600 (0.604)	7.6347	1219.0 (1210.8)	1142.7	0.05219 (0.05224)	1.4941	9057.6
0.500 (0.501)	8.6660	1196.3 (1187.1)	1155.1	0.05167 (0.05174)	1.4560	9160.5
0.400 (0.398)	10.1662	1169.1 (1159.2)	1169.8	0.05105 (0.05114)	1.4114	9284.2
0.300 (0.296)	12.5818	1134.8 (1125.0)	1188.4	0.05028 (0.05038)	1.3577	9440.5
0.200 (0.196)	17.2158	1087.1 (1079.0)	1213.8	0.04921 (0.04933)	1.2902	9655.1
0.100 (0.097)	30.2500	1006.7 (1003.8)	1255.7	0.04746 (0.04759)	1.2022	10007.1
0.080 (0.078)	36.4587	981.3 (979.8)	1268.4	0.04693 (0.04704)	1.1820	10116.6
0.060 (0.059)	46.4556	948.3 (948.7)	1284.5	0.04626 (0.04635)	1.1621	10254.8
0.050 (0.049)	54.2004	927.5 (928.8)	1294.4	0.04584 (0.04591)	1.1531	10340.8
0.040 (0.039)	65.4860	902.0 (904.1)	1306.2	0.04535 (0.04539)	1.1458	10444.5
0.030 (0.030)	83.5756	869.1 (871.9)	1320.8	0.04474 (0.04473)	1.1422	10575.9
0.020 (0.020)	117.7658	822.7 (825.5)	1340.5	0.04391 (0.04383)	1.1479	10756.8
0.010 (0.010)	210.5945	742.9 (744.6)	1371.2	0.04263 (0.04246)	1.1843	11055.3
0.008 (0.008)	253.3366	716.7 (718.5)	1380.5	0.04224 (0.04207)	1.2025	11148.3
0.006 (0.006)	321.5383	684.1 (684.9)	1391.6	0.04177 (0.04162)	1.2303	11266.7
0.005 (0.005)	373.8735	663.8 (663.8)	1398.2	0.04150 (0.04136)	1.2503	11340.8
0.004 (0.004)	449.0586	638.9 (638.3)	1406.2	0.04117 (0.04109)	1.2772	11429.7
0.003 (0.003)	568.0667	607.2 (606.1)	1415.9	0.04076 (0.04080)	1.3153	11541.8
0.002 (0.002)	789.4900	563.6 (562.6)	1428.7	0.04022 (0.04054)	1.3754	11694.7



* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PBX-9501 HMX/BINDER RHO = 1.8410 G/CC EO = 5.838258E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
357.569	1.42098	0.62387	0.01689	1.29885	0.00111	0.00014	0.00129	0.00097	0.00001	0.00000	0.00424	0.82537
300.000	1.41935	0.62102	0.02612	1.29939	0.00200	0.00007	0.00182	0.00084	0.00001	0.00000	0.00261	0.81899
200.000	1.41180	0.60747	0.06304	1.29931	0.00669	0.00001	0.00381	0.00052	0.00002	0.00002	0.00078	0.79561
100.000	1.37780	0.56646	0.18015	1.29662	0.03097	0.00000	0.00990	0.00015	0.00003	0.00040	0.00008	0.71912
80.000	1.35930	0.55242	0.22684	1.29540	0.04474	0.00000	0.01238	0.00009	0.00003	0.00092	0.00004	0.68596
60.000	1.32935	0.53699	0.28772	1.29377	0.06681	0.00000	0.01566	0.00004	0.00002	0.00241	0.00001	0.63901
50.000	1.30694	0.52976	0.32461	1.29279	0.08280	0.00000	0.01764	0.00003	0.00002	0.00415	0.00001	0.60761
40.000	1.27602	0.52430	0.36646	1.29170	0.10370	0.00000	0.01980	0.00001	0.00001	0.00753	0.00000	0.56783
30.000	1.23236	0.52333	0.41209	1.29070	0.13081	0.00000	0.02181	0.00001	0.00001	0.01431	0.00000	0.51640
20.000	1.15923	0.53360	0.46468	1.28985	0.16699	0.00000	0.02351	0.00000	0.00000	0.03151	0.00000	0.43633
10.000	1.02550	0.57820	0.50922	1.29050	0.20823	0.00000	0.02222	0.00000	0.00000	0.07873	0.00000	0.29998
8.000	0.98393	0.59665	0.51389	1.29107	0.21593	0.00000	0.02108	0.00000	0.00000	0.09651	0.00000	0.25907
6.000	0.93274	0.62074	0.51691	1.29191	0.22357	0.00000	0.01940	0.00000	0.00000	0.11955	0.00000	0.20893
5.000	0.90409	0.63684	0.51336	1.29248	0.22627	0.00000	0.01826	0.00000	0.00000	0.13338	0.00000	0.18255
4.000	0.87251	0.65649	0.50566	1.29318	0.22830	0.00000	0.01686	0.00000	0.00000	0.14920	0.00000	0.15479
3.000	0.83748	0.68128	0.49111	1.29404	0.22941	0.00000	0.01513	0.00000	0.00000	0.16746	0.00000	0.12631
2.000	0.79954	0.71532	0.46098	1.29516	0.22828	0.00000	0.01291	0.00000	0.00000	0.18867	0.00000	0.10118
1.000	0.75681	0.76675	0.40085	1.29670	0.22459	0.00000	0.00982	0.00000	0.00000	0.21419	0.00000	0.08435
0.800	0.74842	0.78182	0.37910	1.29712	0.22282	0.00000	0.00899	0.00000	0.00000	0.21989	0.00000	0.08533
0.600	0.74132	0.80036	0.34912	1.29760	0.21989	0.00000	0.00803	0.00000	0.00000	0.22563	0.00000	0.09102
0.500	0.73878	0.81151	0.32937	1.29788	0.21773	0.00000	0.00747	0.00000	0.00000	0.22840	0.00000	0.09685
0.400	0.73753	0.82440	0.30484	1.29820	0.21485	0.00000	0.00683	0.00000	0.00000	0.23095	0.00000	0.10594
0.300	0.73892	0.83982	0.27262	1.29857	0.21056	0.00000	0.00608	0.00000	0.00000	0.23295	0.00000	0.12074
0.200	0.74618	0.85907	0.22685	1.29904	0.20317	0.00000	0.00515	0.00000	0.00000	0.23372	0.00000	0.14648
0.100	0.77047	0.88427	0.15218	1.29971	0.18590	0.00000	0.00382	0.00000	0.00000	0.23121	0.00000	0.19847
0.080	0.78058	0.88995	0.13072	1.29989	0.17918	0.00000	0.00346	0.00000	0.00000	0.22979	0.00000	0.21568
0.060	0.79523	0.89552	0.10493	1.30010	0.16919	0.00000	0.00304	0.00000	0.00000	0.22777	0.00000	0.23792
0.050	0.80535	0.89793	0.08999	1.30022	0.16217	0.00000	0.00279	0.00000	0.00000	0.22641	0.00000	0.25182
0.040	0.81845	0.89967	0.07343	1.30036	0.15296	0.00000	0.00251	0.00000	0.00000	0.22468	0.00000	0.26837
0.030	0.83655	0.89989	0.05489	1.30053	0.14006	0.00000	0.00218	0.00000	0.00000	0.22232	0.00000	0.28905
0.020	0.86446	0.89630	0.03418	1.30073	0.12017	0.00000	0.00178	0.00000	0.00000	0.21862	0.00000	0.31705
0.010	0.91857	0.88018	0.01231	1.30102	0.08376	0.00000	0.00121	0.00000	0.00000	0.21019	0.00000	0.36344
0.008	0.93814	0.87246	0.00821	1.30110	0.07186	0.00000	0.00105	0.00000	0.00000	0.20648	0.00000	0.37900
0.006	0.96362	0.86147	0.00471	1.30119	0.05804	0.00000	0.00088	0.00000	0.00000	0.20078	0.00000	0.39919
0.005	0.98018	0.85393	0.00322	1.30124	0.05005	0.00000	0.00078	0.00000	0.00000	0.19657	0.00000	0.41239
0.004	1.00140	0.84397	0.00194	1.30130	0.04084	0.00000	0.00066	0.00000	0.00000	0.19065	0.00000	0.42957
0.003	1.02980	0.83027	0.00095	1.30136	0.03047	0.00000	0.00053	0.00000	0.00000	0.18173	0.00000	0.45317
0.002	1.07166	0.80968	0.00030	1.30144	0.01892	0.00000	0.00038	0.00000	0.00000	0.16669	0.00000	0.48945
400.000	1.42129	0.62358	0.01440	1.29777	0.00086	0.00025	0.00116	0.00123	0.00001	0.00000	0.00652	0.82815
500.000	1.42134	0.62024	0.01141	1.29385	0.00058	0.00072	0.00107	0.00197	0.00001	0.00000	0.01445	0.83448
600.000	1.42044	0.61438	0.01204	1.28869	0.00054	0.00128	0.00140	0.00286	0.00001	0.00000	0.02444	0.83971

PRESS ;KBAR, PRODUCTS ;MOLES

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

EDC-11 HMX/RDX/BIND RHO = 1.7820 G/CC EO = 1.796663E+03 CAL/MOLE

LN P = -3.56826878 E+00 -2.43549442 E+00LN V 3.23700845 E-01LN V*2 -3.09126116 E-02LN V*3 7.90625578 E-04LN V*4

LN T = 7.68241882 E+00 -4.48306561 E-01LN V 1.24875784 E-01LN V*2 -1.93887688 E-02LN V*3 1.02769514 E-03LN V*4

LN E = -1.63415909 E+00 4.56628978 E-01LNP 7.13893771 E-02LN P*2 5.48490509 E-03LN P*3 1.56022492 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (654.678)	0.3297	4433.8 (4280.0)	-1491.2	0.16239 (0.15731)	3.2724	480.3
500.000 (519.455)	0.3541	4062.4 (4045.8)	-1149.2	0.14808 (0.14688)	3.2112	978.6
400.000 (404.389)	0.3831	3735.7 (3810.6)	-826.2	0.13457 (0.13578)	3.1449	1520.3
* 307.965 (306.492)	0.4188	3437.2 (3570.8)	-523.9	0.12192 (0.12473)	3.0713	2093.8
300.000 (297.765)	0.4228	3424.7 (3547.0)	-503.7	0.12108 (0.12373)	3.0636	2152.6
200.000 (192.651)	0.4887	3213.6 (3212.6)	-217.7	0.10911 (0.11014)	2.9478	2981.7
100.000 (94.950)	0.6263	2821.5 (2756.2)	153.6	0.09357 (0.09351)	2.7591	4128.5
80.000 (76.069)	0.6793	2696.1 (2632.3)	247.3	0.08965 (0.08945)	2.6999	4444.5
60.000 (57.322)	0.7554	2538.0 (2485.9)	354.2	0.08518 (0.08491)	2.6244	4821.7
50.000 (47.990)	0.8089	2442.0 (2400.2)	414.1	0.08267 (0.08239)	2.5770	5044.8
40.000 (38.655)	0.8805	2330.2 (2302.0)	480.2	0.07991 (0.07962)	2.5194	5303.2
30.000 (28.966)	0.9891	2198.4 (2180.5)	553.9	0.07682 (0.07650)	2.4426	5627.0
20.000 (19.725)	1.1616	2029.4 (2034.5)	642.4	0.07312 (0.07282)	2.3406	6024.7
10.000 (10.189)	1.5574	1796.0 (1820.1)	759.0	0.06824 (0.06798)	2.1666	6632.4
8.000 (8.228)	1.7211	1733.1 (1759.5)	790.2	0.06694 (0.06672)	2.1108	6811.3
6.000 (6.224)	1.9691	1660.9 (1686.1)	825.9	0.06545 (0.06526)	2.0384	7033.8
5.000 (5.206)	2.1516	1619.2 (1642.3)	846.5	0.06458 (0.06442)	1.9925	7170.0
4.000 (4.176)	2.4072	1571.6 (1591.5)	870.4	0.06358 (0.06347)	1.9362	7332.1
3.000 (3.126)	2.8038	1517.3 (1529.8)	897.3	0.06246 (0.06234)	1.8631	7535.7
2.000 (2.073)	3.5172	1446.6 (1451.2)	933.5	0.06094 (0.06090)	1.7617	7808.3
1.000 (1.020)	5.3709	1342.7 (1336.5)	988.2	0.05865 (0.05874)	1.5942	8243.2
0.800 (0.811)	6.2163	1312.8 (1304.2)	1004.3	0.05798 (0.05810)	1.5429	8375.9
0.600 (0.603)	7.5598	1275.8 (1265.6)	1024.4	0.05714 (0.05729)	1.4792	8542.4
0.500 (0.500)	8.5956	1253.2 (1242.5)	1036.8	0.05662 (0.05679)	1.4405	8645.6
0.400 (0.398)	10.1068	1226.2 (1215.6)	1051.7	0.05600 (0.05619)	1.3950	8769.9
0.300 (0.296)	12.5489	1192.3 (1182.9)	1070.5	0.05521 (0.05542)	1.3400	8927.1
0.200 (0.195)	17.2574	1145.7 (1139.4)	1096.4	0.05413 (0.05434)	1.2708	9143.3
0.100 (0.097)	30.6078	1068.7 (1069.2)	1139.2	0.05234 (0.05252)	1.1794	9498.8
0.080 (0.078)	37.0094	1044.8 (1047.0)	1152.2	0.05179 (0.05194)	1.1580	9609.7
0.060 (0.059)	47.3679	1014.3 (1018.2)	1168.8	0.05110 (0.05119)	1.1365	9750.1
0.050 (0.049)	55.4285	995.0 (999.9)	1179.2	0.05066 (0.05072)	1.1264	9837.6
0.040 (0.039)	67.2356	971.9 (977.2)	1191.4	0.05015 (0.05016)	1.1177	9943.5
0.030 (0.030)	86.2872	942.3 (947.4)	1206.8	0.04951 (0.04945)	1.1122	10078.2
0.020 (0.020)	122.6644	901.0 (904.8)	1227.6	0.04864 (0.04848)	1.1151	10264.7
0.010 (0.010)	223.4044	831.1 (830.8)	1260.7	0.04725 (0.04700)	1.1465	10575.8
0.008 (0.008)	270.8118	808.8 (807.1)	1270.6	0.04684 (0.04658)	1.1630	10674.2
0.006 (0.006)	346.6921	780.0 (777.1)	1282.9	0.04632 (0.04609)	1.1886	10799.2
0.005 (0.005)	405.2153	761.7 (758.5)	1290.5	0.04601 (0.04582)	1.2071	10877.4
0.004 (0.004)	490.1851	739.3 (736.3)	1299.4	0.04563 (0.04554)	1.2320	10972.0
0.003 (0.003)	625.8354	710.5 (708.9)	1310.5	0.04517 (0.04525)	1.2676	11091.8
0.002 (0.002)	879.6274	668.7 (673.3)	1325.7	0.04453 (0.04502)	1.3234	11255.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

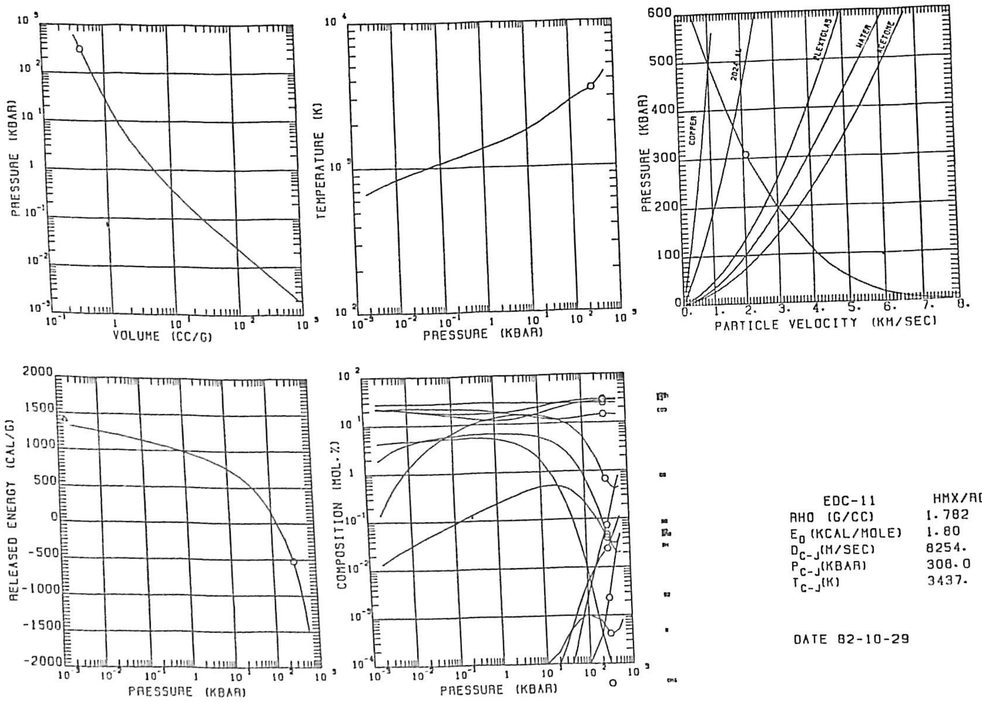
EDC-11 HMX/RDX/BIND RHO = 1.7820 G/CC EO = 1.796663E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
307.965	1.31637	0.63945	0.02958	1.11405	0.00204	0.00010	0.00177	0.00106	0.00002	0.00000	0.00324	1.24497
300.000	1.31606	0.63877	0.03149	1.11411	0.00223	0.00009	0.00186	0.00104	0.00002	0.00000	0.00303	1.24373
200.000	1.30808	0.62190	0.07580	1.11415	0.00738	0.00002	0.00384	0.00067	0.00003	0.00002	0.00096	1.21628
100.000	1.27277	0.57175	0.21276	1.11166	0.03329	0.00000	0.00967	0.00020	0.00004	0.00046	0.00011	1.12902
80.000	1.25350	0.55420	0.26727	1.11052	0.04791	0.00000	0.01201	0.00013	0.00004	0.00105	0.00005	1.09148
60.000	1.22241	0.53439	0.33807	1.10902	0.07122	0.00000	0.01505	0.00006	0.00003	0.00268	0.00002	1.03886
50.000	1.19919	0.52452	0.38108	1.10812	0.08804	0.00000	0.01685	0.00004	0.00003	0.00453	0.00001	1.00388
40.000	1.16722	0.51592	0.43028	1.10715	0.11003	0.00000	0.01880	0.00002	0.00002	0.00807	0.00000	0.95974
30.000	1.12249	0.51120	0.48445	1.10629	0.13840	0.00000	0.02087	0.00000	0.00001	0.01496	0.00000	0.90339
20.000	1.04875	0.51597	0.54866	1.10561	0.17626	0.00000	0.02053	0.00001	0.00001	0.03189	0.00000	0.81748
10.000	0.91753	0.54989	0.61205	1.10635	0.22076	0.00000	0.02041	0.00000	0.00000	0.07635	0.00000	0.67571
8.000	0.87891	0.56550	0.61946	1.10691	0.22888	0.00000	0.01929	0.00000	0.00000	0.09245	0.00000	0.63659
6.000	0.83259	0.58649	0.62381	1.10771	0.23664	0.00000	0.01768	0.00000	0.00000	0.11293	0.00000	0.59078
5.000	0.80609	0.60010	0.62309	1.10824	0.24016	0.00000	0.01662	0.00000	0.00000	0.12522	0.00000	0.56560
4.000	0.77727	0.61711	0.61790	1.10888	0.24307	0.00000	0.01534	0.00000	0.00000	0.13913	0.00000	0.53986
3.000	0.74407	0.63749	0.61034	1.10967	0.24656	0.00000	0.01378	0.00000	0.00000	0.15516	0.00000	0.51102
2.000	0.70893	0.66722	0.58603	1.11067	0.24819	0.00000	0.01177	0.00000	0.00000	0.17342	0.00000	0.48734
1.000	0.67068	0.71547	0.52777	1.11207	0.24806	0.00000	0.00896	0.00000	0.00000	0.19471	0.00000	0.47606
0.800	0.66311	0.73007	0.50615	1.11245	0.24766	0.00000	0.00822	0.00000	0.00000	0.19926	0.00000	0.47852
0.600	0.65652	0.74842	0.47604	1.11288	0.24676	0.00000	0.00734	0.00000	0.00000	0.20366	0.00000	0.48587
0.500	0.65407	0.75975	0.45585	1.11314	0.24600	0.00000	0.00684	0.00000	0.00000	0.20565	0.00000	0.49277
0.400	0.65267	0.77317	0.43040	1.11343	0.24496	0.00000	0.00626	0.00000	0.00000	0.20730	0.00000	0.50313
0.300	0.65368	0.78981	0.39631	1.11376	0.24327	0.00000	0.00559	0.00000	0.00000	0.20824	0.00000	0.51964
0.200	0.65905	0.81190	0.34657	1.11419	0.24006	0.00000	0.00474	0.00000	0.00000	0.20770	0.00000	0.54784
0.100	0.67803	0.84519	0.26102	1.11479	0.23141	0.00000	0.00355	0.00000	0.00000	0.20343	0.00000	0.60437
0.080	0.68575	0.85430	0.23508	1.11495	0.22788	0.00000	0.00323	0.00000	0.00000	0.20158	0.00000	0.62303
0.060	0.69685	0.86498	0.20262	1.11513	0.22228	0.00000	0.00285	0.00000	0.00000	0.19911	0.00000	0.64729
0.050	0.70451	0.87104	0.18286	1.11524	0.21809	0.00000	0.00263	0.00000	0.00000	0.19754	0.00000	0.66257
0.040	0.71426	0.87755	0.16008	1.11537	0.21251	0.00000	0.00239	0.00000	0.00000	0.19563	0.00000	0.68073
0.030	0.72767	0.88451	0.13276	1.11551	0.20425	0.00000	0.00210	0.00000	0.00000	0.19327	0.00000	0.70344
0.020	0.74817	0.89137	0.09855	1.11569	0.19044	0.00000	0.00175	0.00000	0.00000	0.19020	0.00000	0.73389
0.010	0.78796	0.89433	0.05286	1.11593	0.16092	0.00000	0.00127	0.00000	0.00000	0.18542	0.00000	0.78141
0.008	0.80189	0.89287	0.04184	1.11600	0.15024	0.00000	0.00114	0.00000	0.00000	0.18390	0.00000	0.79539
0.006	0.82113	0.88921	0.02995	1.11607	0.13542	0.00000	0.00098	0.00000	0.00000	0.18180	0.00000	0.81304
0.005	0.83395	0.88589	0.02375	1.11612	0.12563	0.00000	0.00090	0.00000	0.00000	0.18035	0.00000	0.82400
0.004	0.85022	0.88089	0.01750	1.11617	0.11346	0.00000	0.00079	0.00000	0.00000	0.17838	0.00000	0.83723
0.003	0.87221	0.87297	0.01135	1.11623	0.09764	0.00000	0.00068	0.00000	0.00000	0.17538	0.00000	0.85429
0.002	0.90634	0.85883	0.00552	1.11630	0.07484	0.00000	0.00053	0.00000	0.00000	0.16983	0.00000	0.87982
400.000	1.31732	0.63978	0.02104	1.11148	0.00120	0.00040	0.00142	0.00190	0.00002	0.00000	0.00873	1.25318
500.000	1.31704	0.63487	0.01781	1.10619	0.00088	0.00114	0.00140	0.00315	0.00002	0.00000	0.01931	1.26132
600.000	1.31537	0.62572	0.01986	1.09881	0.00089	0.00213	0.00193	0.00485	0.00003	0.00000	0.03356	1.26842

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



EDC-11	HMX/RDX/BIN(
RHO (G/CC)	1.782
E_0 (KCAL/MOLE)	1.80
D_{C-J}(M/SEC)	8254.
P_{C-J}(KBAR)	308.0
T_{C-J}(K)	3437.

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

HBX-O RDX/TNT/WAX RHO = 1.6200 G/CC EO = -1.654945E+03 CAL/MOLE

LN P = -3.58909035 E+00 -2.42561531 E+00LN V 3.37342441 E-01LN V*2 -3.55292559 E-02LN V*3 1.21560530 E-03LN V*4

LN T = 7.71552849 E+00 -4.50909972 E-01LN V 1.29894257 E-01LN V*2 -2.06402726 E-02LN V*3 1.15617854 E-03LN V*4

LN E = -1.59930229 E+00 4.38375175 E-01LNP 6.90778494 E-02LN P*2 5.32414019 E-03LN P*3 1.51465385 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (542.853)	0.3481	4411.6 (4279.5)	-1399.6	0.15856 (0.15386)	3.2619	234.6
400.000 (413.658)	0.3788	4009.7 (4006.3)	-1038.0	0.14343 (0.14271)	3.1855	796.4
300.000 (300.820)	0.4192	3631.5 (3714.3)	-687.1	0.12875 (0.13056)	3.0959	1436.1
* 233.437 (231.378)	0.4568	3374.4 (3494.6)	-447.7	0.11873 (0.12165)	3.0221	1935.9
200.000 (195.724)	0.4830	3298.4 (3363.6)	-351.6	0.11471 (0.11682)	2.9750	2241.5
100.000 (95.800)	0.6193	2917.7 (2874.8)	7.2	0.09970 (0.09994)	2.7739	3395.9
80.000 (76.666)	0.6717	2792.5 (2743.1)	99.2	0.09585 (0.09580)	2.7112	3712.2
60.000 (57.712)	0.7471	2632.1 (2587.8)	205.3	0.09141 (0.09118)	2.6315	4089.4
50.000 (48.280)	0.8000	2533.7 (2497.0)	265.3	0.08890 (0.08861)	2.5815	4312.7
40.000 (38.848)	0.8712	2418.2 (2392.8)	331.9	0.08611 (0.08578)	2.5207	4571.5
30.000 (28.858)	0.9822	2281.4 (2261.3)	405.9	0.08302 (0.08260)	2.4378	4903.8
20.000 (19.655)	1.1539	2105.1 (2108.2)	496.3	0.07924 (0.07884)	2.3312	5299.9
10.000 (10.145)	1.5504	1861.0 (1883.9)	616.4	0.07421 (0.07390)	2.1498	5907.1
8.000 (8.176)	1.7164	1797.3 (1820.2)	647.2	0.07292 (0.07262)	2.0915	6087.7
6.000 (6.179)	1.9672	1722.6 (1743.7)	683.7	0.07140 (0.07113)	2.0164	6311.0
5.000 (5.167)	2.1519	1679.4 (1698.3)	705.0	0.07050 (0.07028)	1.9690	6447.6
4.000 (4.144)	2.4113	1630.3 (1645.7)	729.3	0.06949 (0.06930)	1.9110	6610.3
3.000 (3.109)	2.8109	1572.5 (1582.5)	758.5	0.06827 (0.06815)	1.8368	6813.2
2.000 (2.065)	3.5355	1499.6 (1502.1)	795.9	0.06670 (0.06669)	1.7338	7086.8
1.000 (1.017)	5.4339	1394.4 (1385.5)	851.0	0.06439 (0.06448)	1.5654	7525.7
0.800 (0.810)	6.3009	1363.7 (1353.2)	867.7	0.06370 (0.06382)	1.5145	7659.6
0.600 (0.603)	7.6839	1326.0 (1314.4)	888.5	0.06283 (0.06300)	1.4518	7828.0
0.500 (0.501)	8.7531	1302.9 (1291.4)	901.3	0.06229 (0.06248)	1.4139	7932.7
0.400 (0.398)	10.3165	1275.4 (1264.7)	916.8	0.06164 (0.06186)	1.3698	8059.0
0.300 (0.297)	12.8503	1241.0 (1232.3)	936.4	0.06082 (0.06106)	1.3169	8219.0
0.200 (0.196)	17.7516	1194.2 (1189.4)	963.4	0.05969 (0.05994)	1.2511	8439.7
0.100 (0.097)	31.7070	1117.7 (1120.5)	1008.2	0.05782 (0.05803)	1.1662	8803.6
0.080 (0.078)	38.4168	1094.2 (1098.7)	1021.9	0.05724 (0.05741)	1.1467	8917.5
0.060 (0.059)	49.3022	1064.5 (1070.6)	1039.3	0.05651 (0.05662)	1.1272	9061.8
0.050 (0.049)	57.7916	1045.9 (1052.7)	1050.2	0.05606 (0.05613)	1.1181	9152.0
0.040 (0.040)	70.2568	1023.7 (1030.6)	1063.1	0.05552 (0.05553)	1.1101	9261.2
0.030 (0.030)	90.4409	995.7 (1001.8)	1079.4	0.05484 (0.05477)	1.1048	9400.3
0.020 (0.020)	129.1945	957.0 (960.7)	1101.4	0.05392 (0.05374)	1.1061	9593.5
0.010 (0.010)	237.6844	892.9 (891.1)	1137.0	0.05243 (0.05214)	1.1285	9916.6
0.008 (0.008)	289.2400	872.9 (869.3)	1147.7	0.05198 (0.05169)	1.1403	10018.9
0.006 (0.006)	372.3452	847.2 (842.4)	1161.1	0.05142 (0.05116)	1.1582	10149.4
0.005 (0.005)	436.8176	830.9 (826.1)	1169.4	0.05107 (0.05087)	1.1708	10231.1
0.004 (0.004)	531.0320	811.2 (807.1)	1179.3	0.05066 (0.05056)	1.1875	10330.1
0.003 (0.003)	682.7021	786.0 (784.7)	1191.6	0.05014 (0.05024)	1.2106	10455.9
0.002 (0.002)	971.6248	750.6 (757.9)	1208.2	0.04945 (0.04998)	1.2454	10629.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

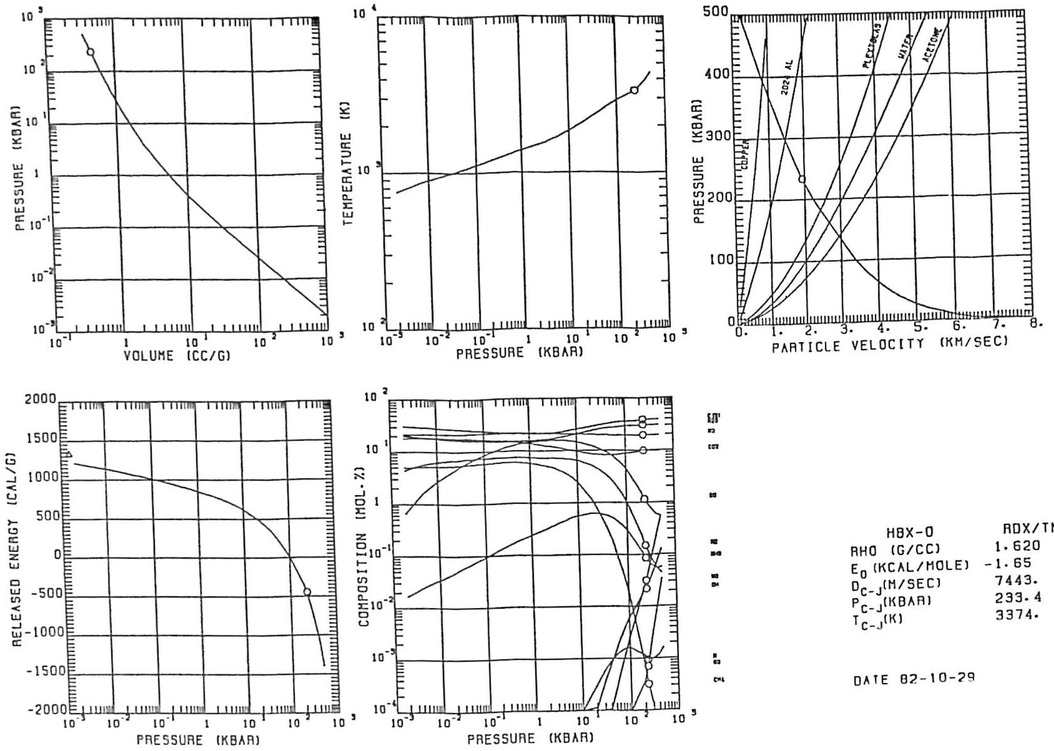
HBX-O RDX/TNT/WAX RHO = 1.6200 G/CC EO = -1.654945E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
233.437	1.51859	0.48072	0.05603	0.96203	0.00729	0.00003	0.00420	0.00106	0.00005	0.00002	0.00155	1.89947
200.000	1.51261	0.47363	0.07695	0.96162	0.01126	0.00002	0.00556	0.00090	0.00006	0.00004	0.00101	1.88562
100.000	1.45726	0.43047	0.22015	0.95753	0.05148	0.00000	0.01464	0.00030	0.00008	0.00094	0.00012	1.78469
80.000	1.42711	0.41662	0.27814	0.95577	0.07395	0.00000	0.01821	0.00019	0.00008	0.00213	0.00006	1.73937
60.000	1.37924	0.40262	0.35415	0.95358	0.10884	0.00000	0.02263	0.00010	0.00006	0.00533	0.00002	1.67416
50.000	1.34411	0.39675	0.40107	0.95236	0.13330	0.00000	0.02508	0.00006	0.00005	0.00883	0.00001	1.62959
40.000	1.29669	0.39314	0.45572	0.95115	0.16424	0.00000	0.02750	0.00004	0.00004	0.01527	0.00001	1.57213
30.000	1.23230	0.39433	0.51774	0.95028	0.20240	0.00000	0.02924	0.00002	0.00003	0.02709	0.00000	1.49709
20.000	1.13084	0.40654	0.59486	0.95000	0.24963	0.00000	0.02981	0.00001	0.00001	0.05378	0.00000	1.38106
10.000	0.96426	0.44753	0.67946	0.95190	0.29856	0.00000	0.02600	0.00000	0.00000	0.11547	0.00000	1.19379
8.000	0.91639	0.46297	0.69649	0.95280	0.30753	0.00000	0.02420	0.00000	0.00000	0.13627	0.00000	1.14055
6.000	0.86186	0.48380	0.70938	0.95401	0.31515	0.00000	0.02180	0.00000	0.00000	0.16153	0.00000	1.08157
5.000	0.83158	0.49715	0.71295	0.95475	0.31832	0.00000	0.02031	0.00000	0.00000	0.17620	0.00000	1.04997
4.000	0.79886	0.51334	0.71320	0.95562	0.32106	0.00000	0.01857	0.00000	0.00000	0.19250	0.00000	1.01723
3.000	0.76350	0.53399	0.70726	0.95666	0.32324	0.00000	0.01650	0.00000	0.00000	0.21064	0.00000	0.98436
2.000	0.72510	0.56234	0.68896	0.95793	0.32477	0.00000	0.01396	0.00000	0.00000	0.23099	0.00000	0.95396
1.000	0.68243	0.60696	0.64240	0.95964	0.32710	0.00000	0.01054	0.00000	0.00000	0.25371	0.00000	0.93317
0.800	0.67446	0.62107	0.62215	0.96009	0.32732	0.00000	0.00964	0.00000	0.00000	0.25826	0.00000	0.93475
0.600	0.66757	0.63890	0.59340	0.96061	0.32755	0.00000	0.00860	0.00000	0.00000	0.26238	0.00000	0.94157
0.500	0.66507	0.64999	0.57372	0.96091	0.32761	0.00000	0.00800	0.00000	0.00000	0.26404	0.00000	0.94849
0.400	0.66378	0.66331	0.54837	0.96125	0.32770	0.00000	0.00732	0.00000	0.00000	0.26515	0.00000	0.95941
0.300	0.66487	0.68008	0.51374	0.96165	0.32770	0.00000	0.00653	0.00000	0.00000	0.26520	0.00000	0.97720
0.200	0.67087	0.70280	0.46230	0.96214	0.32730	0.00000	0.00554	0.00000	0.00000	0.26314	0.00000	1.00798
0.100	0.69018	0.73875	0.37111	0.96283	0.32448	0.00000	0.00416	0.00000	0.00000	0.25594	0.00000	1.07042
0.080	0.69785	0.74915	0.34264	0.96302	0.32304	0.00000	0.00379	0.00000	0.00000	0.25310	0.00000	1.09134
0.060	0.70865	0.76183	0.30648	0.96323	0.32034	0.00000	0.00336	0.00000	0.00000	0.24937	0.00000	1.11853
0.050	0.71595	0.76944	0.28397	0.96336	0.31805	0.00000	0.00311	0.00000	0.00000	0.24706	0.00000	1.13576
0.040	0.72513	0.77804	0.25758	0.96350	0.31490	0.00000	0.00283	0.00000	0.00000	0.24425	0.00000	1.15634
0.030	0.73753	0.78810	0.22506	0.96366	0.30991	0.00000	0.00250	0.00000	0.00000	0.24079	0.00000	1.18227
0.020	0.75609	0.80015	0.18242	0.96386	0.30084	0.00000	0.00211	0.00000	0.00000	0.23634	0.00000	1.21730
0.010	0.79130	0.81409	0.11935	0.96414	0.27894	0.00000	0.00156	0.00000	0.00000	0.23010	0.00000	1.27271
0.008	0.80337	0.81658	0.10230	0.96421	0.27046	0.00000	0.00142	0.00000	0.00000	0.22841	0.00000	1.28896
0.006	0.81995	0.81826	0.08235	0.96429	0.25797	0.00000	0.00125	0.00000	0.00000	0.22650	0.00000	1.30913
0.005	0.83106	0.81841	0.07094	0.96434	0.24914	0.00000	0.00115	0.00000	0.00000	0.22543	0.00000	1.32144
0.004	0.84514	0.81761	0.05847	0.96440	0.23769	0.00000	0.00104	0.00000	0.00000	0.22420	0.00000	1.33594
0.003	0.86424	0.81500	0.04460	0.96446	0.22168	0.00000	0.00091	0.00000	0.00000	0.22275	0.00000	1.35387
0.002	0.89316	0.80830	0.02909	0.96454	0.19700	0.00000	0.00075	0.00000	0.00000	0.22075	0.00000	1.37808
300.000	1.52255	0.48487	0.04043	0.96131	0.00442	0.00013	0.00323	0.00185	0.00005	0.00001	0.00397	1.91094
400.000	1.52417	0.48411	0.02994	0.95777	0.00272	0.00058	0.00269	0.00361	0.00006	0.00000	0.01159	1.92218
500.000	1.52312	0.47643	0.02709	0.95053	0.00220	0.00169	0.00283	0.00631	0.00008	0.00000	0.02592	1.93272

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



	HBX-O	RDX/TNT/WAX
RHO (G/CC)		1.620
E_0 (KCAL/MOLE)		-1.65
D_{C-J}(M/SEC)		7443.
P_{C-J}(KBAR)		233.4
T_{C-J}(K)		3374.

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

NQ/HMX/ESTAN61/21/18 RHO = 1.5700 G/CC EO = -9.907453E+03 CAL/MOLE

LN P = -3.57033920 E+00 -2.51439285 E+00LN V 3.59236896 E-01LN V*2 -3.96326967 E-02LN V*3 1.39041385 E-03LN V*4

LN T = 7.51966190 E+00 -4.40790653 E-01LN V 1.29596829 E-01LN V*2 -2.41468325 E-02LN V*3 1.47264358 E-03LN V*4

LN E = -1.60401440 E+00 4.31849658 E-01LNP 6.92832470 E-02LN P*2 5.36902994 E-03LN P*3 1.54750043 E-04LN P*4

(P: MBARS, T: DEG KELVIN, V : CC/G, E : MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (535.716)	0.3644	3593.0 (3371.1)	-1412.0	0.15908 (0.15384)	3.3665	72.8
400.000 (411.288)	0.3946	3216.2 (3172.2)	-1050.1	0.14394 (0.14291)	3.2898	631.8
300.000 (300.565)	0.4346	2873.7 (2956.1)	-698.4	0.12922 (0.13100)	3.1989	1269.9
* 221.681 (219.766)	0.4800	2608.7 (2760.0)	-415.4	0.11738 (0.12064)	3.1080	1865.6
200.000 (196.702)	0.4975	2574.0 (2694.9)	-353.9	0.11481 (0.11755)	3.0758	2066.6
100.000 (96.275)	0.6328	2324.4 (2323.7)	-11.6	0.10049 (0.10104)	2.8686	3219.5
80.000 (77.085)	0.6844	2241.8 (2223.5)	75.1	0.09686 (0.09701)	2.8043	3533.8
60.000 (58.097)	0.7581	2133.5 (2105.2)	174.1	0.09272 (0.09251)	2.7226	3907.3
50.000 (48.626)	0.8098	2065.1 (2035.8)	230.2	0.09037 (0.09001)	2.6713	4128.5
40.000 (39.145)	0.8792	1982.7 (1955.9)	292.7	0.08775 (0.08728)	2.6089	4384.6
30.000 (29.005)	0.9881	1880.9 (1853.7)	363.0	0.08481 (0.08420)	2.5230	4716.3
20.000 (19.742)	1.1548	1745.9 (1735.1)	449.5	0.08119 (0.08060)	2.4134	5107.9
10.000 (10.120)	1.5408	1554.2 (1558.4)	563.5	0.07642 (0.07591)	2.2256	5710.5
8.000 (8.158)	1.6996	1499.8 (1508.4)	594.9	0.07511 (0.07471)	2.1659	5886.8
6.000 (6.158)	1.9399	1438.3 (1447.7)	629.9	0.07365 (0.07332)	2.0889	6105.5
5.000 (5.145)	2.1165	1403.0 (1411.4)	649.7	0.07281 (0.07253)	2.0402	6239.2
4.000 (4.125)	2.3622	1361.9 (1369.2)	672.8	0.07185 (0.07163)	1.9811	6397.3
3.000 (3.089)	2.7413	1314.8 (1317.8)	698.9	0.07076 (0.07058)	1.9051	6595.0
2.000 (2.051)	3.4196	1252.1 (1251.5)	733.5	0.06931 (0.06927)	1.8004	6859.0
1.000 (1.013)	5.1631	1156.9 (1151.9)	785.0	0.06715 (0.06731)	1.6308	7278.0
0.800 (0.807)	5.9494	1128.5 (1122.9)	800.1	0.06653 (0.06673)	1.5797	7405.1
0.600 (0.602)	7.1902	1093.0 (1087.2)	818.6	0.06575 (0.06600)	1.5171	7564.2
0.500 (0.501)	8.1280	1069.4 (1065.6)	830.9	0.06523 (0.06555)	1.4798	7661.3
0.400 (0.398)	9.5110	1044.2 (1039.3)	843.6	0.06471 (0.06501)	1.4357	7780.2
0.300 (0.297)	11.7090	1010.0 (1006.3)	860.5	0.06400 (0.06432)	1.3836	7928.8
0.200 (0.197)	15.8886	961.8 (960.3)	883.6	0.06303 (0.06335)	1.3191	8132.4
0.100 (0.098)	27.4637	877.8 (881.1)	921.5	0.06144 (0.06170)	1.2369	8464.6
0.080 (0.078)	32.9174	850.8 (855.0)	932.9	0.06097 (0.06117)	1.2183	8567.6
0.060 (0.059)	41.6653	816.3 (821.1)	947.1	0.06037 (0.06050)	1.2001	8697.7
0.050 (0.049)	48.4372	794.9 (799.2)	955.6	0.06002 (0.06008)	1.1918	8778.7
0.040 (0.040)	58.2257	768.4 (772.5)	965.9	0.05959 (0.05958)	1.1849	8875.8
0.030 (0.030)	73.8420	734.7 (737.9)	978.6	0.05905 (0.05894)	1.1812	8998.6
0.020 (0.020)	103.1889	688.1 (689.3)	995.5	0.05835 (0.05810)	1.1848	9166.9
0.010 (0.010)	182.3745	611.4 (609.1)	1021.6	0.05726 (0.05687)	1.2117	9443.2
0.008 (0.008)	218.8432	587.5 (584.6)	1029.3	0.05693 (0.05655)	1.2250	9529.0
0.006 (0.006)	276.6270	557.7 (554.4)	1038.8	0.05654 (0.05621)	1.2449	9637.5
0.005 (0.005)	320.7844	539.2 (536.2)	1044.5	0.05630 (0.05604)	1.2589	9705.0
0.004 (0.004)	384.3242	517.2 (514.9)	1051.3	0.05602 (0.05589)	1.2774	9786.1
0.003 (0.003)	484.9609	489.7 (489.3)	1059.5	0.05567 (0.05580)	1.3030	9888.4
0.002 (0.002)	672.0720	452.6 (457.3)	1070.4	0.05521 (0.05591)	1.3417	10027.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

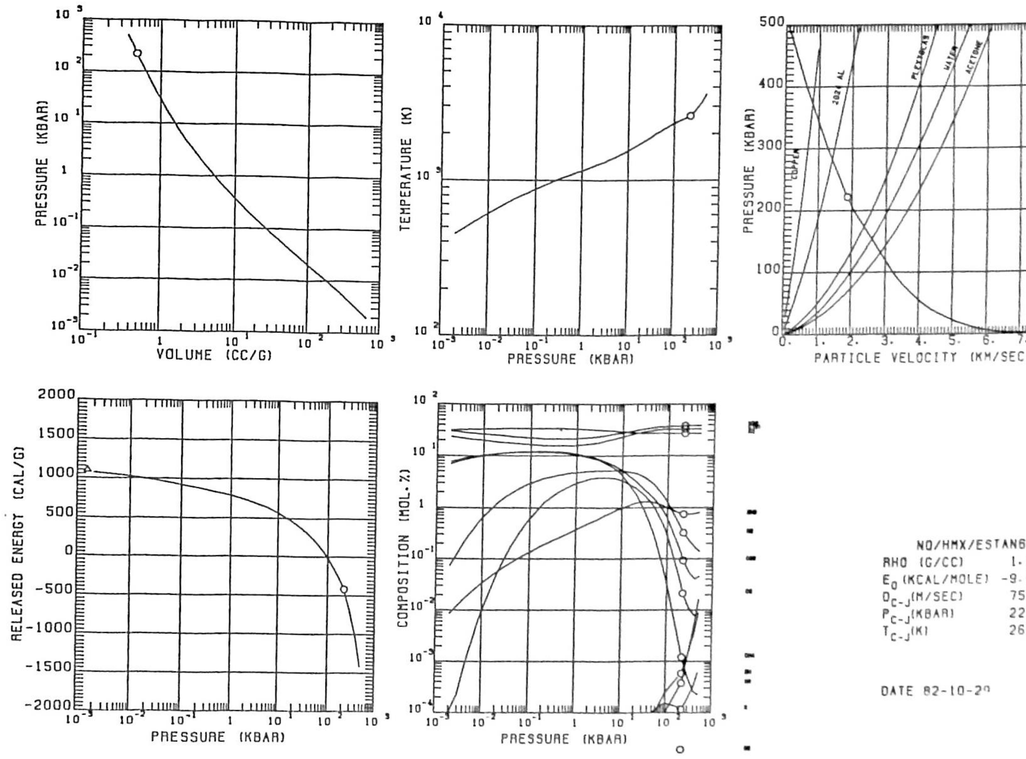
NQ/HMX/ESTAN61/21/18 RHO = 1.5700 G/CC EO = -9.907453E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
221.681	2.05104	0.00501	0.00113	1.45395	0.01725	0.00000	0.03980	0.00003	0.00001	0.00006	0.00002	1.77777
200.000	2.04652	0.00697	0.00173	1.45368	0.02088	0.00000	0.04035	0.00003	0.00001	0.00010	0.00002	1.77517
100.000	1.98060	0.03309	0.01544	1.44779	0.06593	0.00000	0.05214	0.00001	0.00001	0.00170	0.00000	1.73374
80.000	1.94559	0.04572	0.02519	1.44523	0.08911	0.00000	0.05726	0.00001	0.00001	0.00376	0.00000	1.70930
60.000	1.89187	0.06430	0.04176	1.44238	0.12315	0.00000	0.06297	0.00000	0.00001	0.00933	0.00000	1.66858
50.000	1.85296	0.07749	0.05429	1.44106	0.14580	0.00000	0.06560	0.00000	0.00000	0.01549	0.00000	1.63670
40.000	1.80061	0.09530	0.07105	1.44017	0.17272	0.00000	0.06739	0.00000	0.00000	0.02686	0.00000	1.59076
30.000	1.72830	0.12053	0.09288	1.44038	0.20318	0.00000	0.06697	0.00000	0.00000	0.04810	0.00000	1.52246
20.000	1.60931	0.16452	0.12398	1.44255	0.23393	0.00000	0.06262	0.00000	0.00000	0.09549	0.00000	1.39999
10.000	1.39113	0.25340	0.16439	1.44942	0.25324	0.00000	0.04888	0.00000	0.00000	0.20522	0.00000	1.16096
8.000	1.32681	0.28274	0.17006	1.45179	0.25156	0.00000	0.04415	0.00000	0.00000	0.24177	0.00000	1.08940
6.000	1.24822	0.31947	0.17517	1.45461	0.24841	0.00000	0.03851	0.00000	0.00000	0.28687	0.00000	1.00246
5.000	1.20262	0.34154	0.17664	1.45624	0.24583	0.00000	0.03526	0.00000	0.00000	0.31340	0.00000	0.95242
4.000	1.15322	0.36685	0.17543	1.45806	0.24154	0.00000	0.03161	0.00000	0.00000	0.34298	0.00000	0.89874
3.000	1.09675	0.39650	0.17262	1.46010	0.23685	0.00000	0.02752	0.00000	0.00000	0.37663	0.00000	0.83826
2.000	1.03624	0.43257	0.16099	1.46252	0.22780	0.00000	0.02269	0.00000	0.00000	0.41503	0.00000	0.77541
1.000	0.97041	0.48013	0.13166	1.46560	0.21079	0.00000	0.01653	0.00000	0.00000	0.46107	0.00000	0.71112
0.800	0.95731	0.49207	0.12087	1.46638	0.20491	0.00000	0.01498	0.00000	0.00000	0.47173	0.00000	0.69931
0.600	0.94552	0.50516	0.10647	1.46727	0.19688	0.00000	0.01320	0.00000	0.00000	0.48297	0.00000	0.68935
0.500	0.94207	0.51218	0.09587	1.46778	0.19011	0.00000	0.01218	0.00000	0.00000	0.48885	0.00000	0.68707
0.400	0.93785	0.51928	0.08590	1.46834	0.18447	0.00000	0.01107	0.00000	0.00000	0.49461	0.00000	0.68414
0.300	0.93824	0.52620	0.07168	1.46899	0.17478	0.00000	0.00976	0.00000	0.00000	0.50024	0.00000	0.68579
0.200	0.94635	0.53153	0.05292	1.46980	0.15956	0.00000	0.00814	0.00000	0.00000	0.50500	0.00000	0.69449
0.100	0.97830	0.52870	0.02664	1.47094	0.12844	0.00000	0.00587	0.00000	0.00000	0.50630	0.00000	0.72227
0.080	0.99214	0.52490	0.02041	1.47125	0.11769	0.00000	0.00526	0.00000	0.00000	0.50522	0.00000	0.73341
0.060	1.01196	0.51821	0.01398	1.47161	0.10364	0.00000	0.00453	0.00000	0.00000	0.50287	0.00000	0.74892
0.050	1.02539	0.51308	0.01082	1.47182	0.09501	0.00000	0.00412	0.00000	0.00000	0.50079	0.00000	0.75929
0.040	1.04339	0.50566	0.00765	1.47205	0.08415	0.00000	0.00365	0.00000	0.00000	0.49757	0.00000	0.77307
0.030	1.06823	0.49474	0.00469	1.47233	0.07063	0.00000	0.00310	0.00000	0.00000	0.49232	0.00000	0.79224
0.020	1.10645	0.47690	0.00216	1.47267	0.05308	0.00000	0.00243	0.00000	0.00000	0.48250	0.00000	0.82243
0.010	1.18118	0.44041	0.00044	1.47311	0.02891	0.00000	0.00153	0.00000	0.00000	0.45789	0.00000	0.88525
0.008	1.20813	0.42706	0.00024	1.47323	0.02290	0.00000	0.00130	0.00000	0.00000	0.44759	0.00000	0.90909
0.006	1.24481	0.40878	0.00011	1.47336	0.01651	0.00000	0.00105	0.00000	0.00000	0.43263	0.00000	0.94249
0.005	1.26934	0.39653	0.00006	1.47343	0.01320	0.00000	0.00091	0.00000	0.00000	0.42213	0.00000	0.96526
0.004	1.30080	0.38083	0.00003	1.47351	0.00984	0.00000	0.00076	0.00000	0.00000	0.40820	0.00000	0.99493
0.003	1.34346	0.35950	0.00001	1.47359	0.00654	0.00000	0.00059	0.00000	0.00000	0.38865	0.00000	1.03584
0.002	1.40802	0.32722	0.00000	1.47369	0.00344	0.00000	0.00040	0.00000	0.00000	0.35806	0.00000	1.09871
300.000	2.05574	0.00288	0.00059	1.45373	0.01202	0.00000	0.04019	0.00007	0.00001	0.00003	0.00007	1.78048
400.000	2.05706	0.00215	0.00042	1.45305	0.00891	0.00000	0.04136	0.00018	0.00002	0.00001	0.00026	1.78139
500.000	2.05559	0.00243	0.00048	1.45187	0.00759	0.00000	0.04313	0.00045	0.00003	0.00001	0.00085	1.78105

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



	NQ/HMX/ESTAN61/21/18
RHO (G/CC)	1.570
E_0 (KCAL/MOLE)	-9.91
D_{C-J}(M/SEC)	7568.
P_{C-J}(KBAR)	221.7
T_{C-J}(K)	2609.

DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PYX/POLYETHY95/5 RHO = 1.5560 G/CC EO = 3.195672E+03 CAL/MOLE

LN P = -3.71651554 E+00 -2.42224789 E+00LN V 3.56858373 E-01LN V*2 -4.09262441 E-02LN V*3 1.64854550 E-03LN V*4

LN T = 7.75787449 E+00 -4.53020632 E-01LN V 1.39824510 E-01LN V*2 -2.33048201 E-02LN V*3 1.39015820 E-03LN V*4

LN E = -1.59802151 E+00 4.21416223 E-01LNP 6.79607391 E-02LN P*2 5.28459996 E-03LN P*3 1.50958862 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (430.748)	0.3620	4519.3 (4396.0)	-1162.2	0.14863 (0.14499)	3.2811	53.4
300.000 (308.926)	0.4012	4055.9 (4051.7)	-796.3	0.13332 (0.13322)	3.1814	691.9
200.000 (200.145)	0.4612	3588.8 (3653.7)	-430.7	0.11802 (0.11988)	3.0512	1469.0
* 176.423 (175.809)	0.4814	3469.0 (3545.1)	-340.1	0.11423 (0.11639)	3.0123	1686.9
100.000 (96.698)	0.5907	3106.2 (3098.5)	-66.1	0.10277 (0.10349)	2.8330	2609.6
80.000 (77.074)	0.6405	2966.1 (2949.9)	21.9	0.09908 (0.09947)	2.7651	2922.0
60.000 (57.774)	0.7121	2790.7 (2776.0)	122.6	0.09487 (0.09499)	2.6790	3293.0
50.000 (48.228)	0.7623	2684.9 (2674.8)	179.3	0.09250 (0.09251)	2.6252	3511.7
40.000 (38.744)	0.8294	2562.9 (2559.7)	241.6	0.08989 (0.08978)	2.5601	3763.8
30.000 (28.662)	0.9350	2420.3 (2413.8)	310.4	0.08701 (0.08671)	2.4707	4089.4
20.000 (19.541)	1.0958	2237.8 (2247.5)	394.2	0.08351 (0.08311)	2.3580	4471.0
10.000 (10.120)	1.4661	1985.1 (2005.7)	506.0	0.07883 (0.07842)	2.1668	5055.0
8.000 (8.152)	1.6223	1919.8 (1936.9)	533.9	0.07766 (0.07721)	2.1049	5230.1
6.000 (6.161)	1.8579	1842.1 (1854.9)	567.6	0.07625 (0.07582)	2.0257	5446.3
5.000 (5.154)	2.0312	1796.2 (1806.5)	588.0	0.07540 (0.07502)	1.9758	5578.3
4.000 (4.132)	2.2758	1744.7 (1750.4)	610.8	0.07445 (0.07411)	1.9147	5736.2
3.000 (3.098)	2.6536	1683.9 (1683.3)	637.9	0.07331 (0.07304)	1.8365	5933.4
2.000 (2.056)	3.3405	1607.1 (1598.7)	673.0	0.07184 (0.07169)	1.7285	6199.5
1.000 (1.015)	5.1388	1494.4 (1478.5)	726.7	0.06960 (0.06964)	1.5541	6625.2
0.800 (0.810)	5.9570	1460.6 (1445.7)	744.1	0.06887 (0.06903)	1.5021	6754.5
0.600 (0.604)	7.2736	1420.5 (1406.7)	764.3	0.06802 (0.06826)	1.4379	6918.7
0.500 (0.501)	8.2950	1396.3 (1383.6)	776.8	0.06750 (0.06777)	1.3994	7021.0
0.400 (0.399)	9.7880	1367.3 (1357.1)	792.0	0.06686 (0.06718)	1.3548	7144.3
0.300 (0.297)	12.2349	1332.6 (1324.7)	809.7	0.06612 (0.06643)	1.3013	7302.0
0.200 (0.196)	16.9556	1284.3 (1282.5)	835.8	0.06503 (0.06535)	1.2362	7518.4
0.100 (0.098)	30.4484	1207.0 (1214.8)	878.9	0.06323 (0.06349)	1.1540	7876.3
0.080 (0.078)	36.9549	1183.6 (1193.2)	892.2	0.06267 (0.06288)	1.1356	7988.5
0.060 (0.059)	47.5346	1154.4 (1165.3)	909.1	0.06197 (0.06210)	1.1173	8131.0
0.050 (0.049)	55.8062	1136.3 (1147.4)	919.6	0.06152 (0.06161)	1.1088	8220.2
0.040 (0.040)	67.9789	1114.8 (1125.2)	932.1	0.06100 (0.06101)	1.1013	8328.4
0.030 (0.030)	87.7596	1087.9 (1096.4)	947.9	0.06034 (0.06025)	1.0962	8466.5
0.020 (0.020)	125.9491	1051.6 (1055.5)	969.5	0.05944 (0.05922)	1.0963	8658.7
0.010 (0.010)	234.0189	992.8 (987.7)	1004.6	0.05797 (0.05762)	1.1121	8981.5
0.008 (0.008)	285.8552	974.8 (967.4)	1015.3	0.05752 (0.05717)	1.1200	9084.1
0.006 (0.006)	370.0188	952.2 (943.2)	1028.8	0.05696 (0.05665)	1.1316	9215.2
0.005 (0.005)	435.6409	937.9 (929.2)	1037.3	0.05660 (0.05636)	1.1393	9297.3
0.004 (0.004)	532.2539	920.9 (914.0)	1047.3	0.05618 (0.05606)	1.1490	9397.2
0.003 (0.003)	689.0798	899.4 (897.9)	1059.9	0.05565 (0.05576)	1.1612	9524.4
0.002 (0.002)	991.4431	869.6 (883.9)	1077.1	0.05493 (0.05555)	1.1768	9700.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

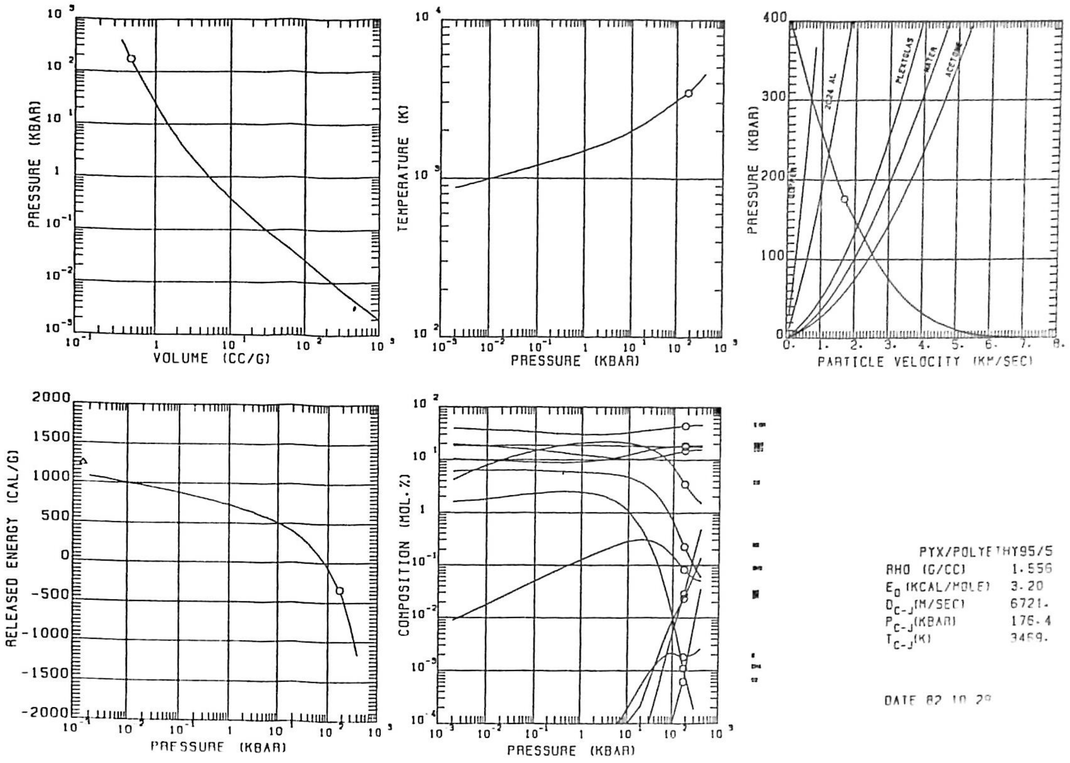
PYX/POLYETHY95/5 RHO = 1.5560 G/CC EO = 3.195672E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
176.423	0.87444	0.70279	0.16393	0.83836	0.01066	0.00003	0.00388	0.00110	0.00008	0.00005	0.00133	2.08903
100.000	0.84694	0.62708	0.34466	0.83724	0.03262	0.00000	0.00720	0.00044	0.00010	0.00049	0.00024	1.98358
80.000	0.83032	0.59551	0.42471	0.83658	0.04608	0.00000	0.00866	0.00028	0.00010	0.00102	0.00012	1.93457
60.000	0.80352	0.55751	0.52773	0.83569	0.06750	0.00000	0.01050	0.00015	0.00008	0.00237	0.00005	1.86821
50.000	0.78352	0.53628	0.59023	0.83517	0.08302	0.00000	0.01157	0.00010	0.00007	0.00381	0.00002	1.82547
40.000	0.75630	0.51410	0.66189	0.83462	0.10335	0.00000	0.01269	0.00006	0.00006	0.00643	0.00001	1.77339
30.000	0.71907	0.49295	0.74150	0.83417	0.12972	0.00000	0.01359	0.00003	0.00004	0.01120	0.00000	1.71016
20.000	0.65997	0.47371	0.83914	0.83386	0.16592	0.00000	0.01420	0.00001	0.00002	0.02220	0.00000	1.62076
10.000	0.56385	0.46880	0.94504	0.83446	0.21128	0.00000	0.01301	0.00000	0.00001	0.04848	0.00000	1.49350
8.000	0.53577	0.47069	0.96938	0.83482	0.22209	0.00000	0.01230	0.00000	0.00001	0.05765	0.00000	1.45810
6.000	0.50442	0.47668	0.98872	0.83533	0.23260	0.00000	0.01127	0.00000	0.00000	0.06884	0.00000	1.42157
5.000	0.48753	0.48245	0.99408	0.83567	0.23752	0.00000	0.01059	0.00000	0.00000	0.07535	0.00000	1.40393
4.000	0.46890	0.48973	0.99815	0.83608	0.24284	0.00000	0.00978	0.00000	0.00000	0.08261	0.00000	1.38531
3.000	0.44875	0.50049	0.99677	0.83657	0.24834	0.00000	0.00879	0.00000	0.00000	0.09069	0.00000	1.36786
2.000	0.42684	0.51782	0.98401	0.83721	0.25424	0.00000	0.00752	0.00000	0.00000	0.09965	0.00000	1.35433
1.000	0.40340	0.55191	0.93927	0.83810	0.26146	0.00000	0.00574	0.00000	0.00000	0.10910	0.00000	1.35553
0.800	0.39976	0.56558	0.91557	0.83834	0.26246	0.00000	0.00526	0.00000	0.00000	0.11077	0.00000	1.36388
0.600	0.39592	0.58183	0.88692	0.83862	0.26464	0.00000	0.00469	0.00000	0.00000	0.11203	0.00000	1.37504
0.500	0.39439	0.59229	0.86754	0.83879	0.26605	0.00000	0.00437	0.00000	0.00000	0.11232	0.00000	1.38367
0.400	0.39366	0.60573	0.84138	0.83897	0.26758	0.00000	0.00399	0.00000	0.00000	0.11220	0.00000	1.39649
0.300	0.39301	0.62126	0.81097	0.83919	0.27076	0.00000	0.00355	0.00000	0.00000	0.11128	0.00000	1.41230
0.200	0.39543	0.64621	0.75867	0.83947	0.27392	0.00000	0.00300	0.00000	0.00000	0.10890	0.00000	1.44204
0.100	0.40347	0.68984	0.66338	0.83986	0.27888	0.00000	0.00223	0.00000	0.00000	0.10296	0.00000	1.49963
0.080	0.40654	0.70360	0.63278	0.83996	0.28046	0.00000	0.00203	0.00000	0.00000	0.10080	0.00000	1.51861
0.060	0.41080	0.72136	0.59302	0.84008	0.28222	0.00000	0.00179	0.00000	0.00000	0.09797	0.00000	1.54345
0.050	0.41364	0.73261	0.56769	0.84015	0.28315	0.00000	0.00165	0.00000	0.00000	0.09619	0.00000	1.55933
0.040	0.41708	0.74600	0.53745	0.84022	0.28426	0.00000	0.00150	0.00000	0.00000	0.09402	0.00000	1.57834
0.030	0.42162	0.76293	0.49908	0.84031	0.28547	0.00000	0.00132	0.00000	0.00000	0.09129	0.00000	1.60250
0.020	0.42812	0.78603	0.44636	0.84042	0.28665	0.00000	0.00111	0.00000	0.00000	0.08761	0.00000	1.63579
0.010	0.43994	0.82329	0.36004	0.84057	0.28663	0.00000	0.00082	0.00000	0.00000	0.08192	0.00000	1.69056
0.008	0.44383	0.83431	0.33412	0.84061	0.28625	0.00000	0.00074	0.00000	0.00000	0.08023	0.00000	1.70715
0.006	0.44902	0.84793	0.30168	0.84065	0.28525	0.00000	0.00065	0.00000	0.00000	0.07819	0.00000	1.72801
0.005	0.45270	0.85635	0.28117	0.84068	0.28403	0.00000	0.00060	0.00000	0.00000	0.07701	0.00000	1.74127
0.004	0.45708	0.86597	0.25757	0.84070	0.28253	0.00000	0.00055	0.00000	0.00000	0.07561	0.00000	1.75667
0.003	0.46310	0.87756	0.22836	0.84074	0.27998	0.00000	0.00048	0.00000	0.00000	0.07393	0.00000	1.77595
0.002	0.47240	0.89228	0.18964	0.84078	0.27494	0.00000	0.00041	0.00000	0.00000	0.07186	0.00000	1.80203
200.000	0.87707	0.71212	0.14154	0.83820	0.00851	0.00005	0.00347	0.00143	0.00009	0.00003	0.00206	2.10212
300.000	0.88180	0.73142	0.08930	0.83550	0.00421	0.00040	0.00258	0.00335	0.00010	0.00001	0.00835	2.13507
400.000	0.88195	0.73129	0.06966	0.82845	0.00283	0.00162	0.00239	0.00637	0.00012	0.00000	0.02265	2.15485

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-22>> **********

EXPLOSIVES	RDX 80 TNT 20	#RDX 60 TNT 40	#RDX 40 TNT 60	#RDX 20 TNT 80	#HMX 80 TNT 20	#HMX 60 TNT 40	#HMX 40 TNT 60	#
RHO (G/CC)	1.769	1.739	1.709	1.681	1.845	1.793	1.744	
EO (KCAL/MOLE)	4.84	2.07	-0.71	-3.48	3.58	1.12	-1.33	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
C	1.6969	2.0431	2.3894	2.7356	1.6969	2.0431	2.3894	
H	2.6013	2.5013	2.4013	2.3013	2.6013	2.5013	2.4013	
N	2.4252	2.1491	1.8730	1.5969	2.4252	2.1491	1.8730	
O	2.6893	2.6774	2.6655	2.6535	2.6893	2.6774	2.6655	
DETN.VEL (M/SEC)	8377.2	8024.2	7679.9	7344.3	8615.9	8189.4	7784.7	
PARTICL.VEL(")	2108.4	2008.9	1919.7	1904.2	2107.6	2045.3	1949.0	
C-J PRESS (KBAR)	312.5	280.3	252.0	235.1	335.0	300.3	264.6	
C-J VOLUME (CC/G)	0.42302	0.43108	0.43888	0.44065	0.40942	0.41843	0.42983	
C-J TEMP (DEG K)	3526.7	3511.0	3485.8	3482.6	3392.2	3444.4	3451.6	
C-J S(CAL/DEG MOL)	55.44	57.48	59.65	62.10	54.83	57.15	59.49	
C-J ENERGY (CAL/G)	531.24	482.28	440.39	433.30	530.85	499.91	453.95	
GAMMA	2.973	2.994	3.001	2.857	3.088	3.004	2.994	
C-J DETN.HEAT(CAL)	1441.6	1400.8	1359.4	1318.2	1432.9	1394.8	1355.9	
LAMDA	9.1882	9.2348	9.2848	9.3413	9.1958	9.2426	9.2920	
VOLUM(K LITTRE/KG)	0.7893	0.7496	0.7103	0.6707	0.7874	0.7477	0.7087	
TOTAL PRODCT(MOLE)	4.2111	4.3684	4.5259	4.6837	4.2112	4.3688	4.5262	
V GAS (MOLES)	3.2262	3.0641	2.9034	2.7413	3.2185	3.0563	2.8966	
V GAS (CC/MOLE)	12.1865	12.7089	13.2486	13.6421	11.8225	12.3643	12.9975	
V SOL C(S) (CC/G)	0.25244	0.26598	0.27827	0.28583	0.24253	0.25720	0.27257	
H2O (MOL %)	30.7456	28.4607	26.3312	24.3550	30.8005	28.5077	26.3680	
CO2 (MOL %)	16.0718	15.8075	15.5334	15.2921	16.2279	15.9518	15.6527	
CO (MOL %)	0.8357	1.1046	1.4108	1.6422	0.4925	0.7707	1.1331	
N2 (MOL %)	28.7216	24.5341	20.6360	16.9965	28.7364	24.5396	20.6390	
H2 (MOL %)	0.0541	0.0739	0.0967	0.1116	0.0288	0.0477	0.0739	
O2 (MOL %)	0.0032	0.0023	0.0016	0.0013	0.0028	0.0023	0.0017	
NH3 (MOL %)	0.0469	0.0528	0.0575	0.0576	0.0300	0.0391	0.0479	
OH (MOL %)	0.0318	0.0301	0.0276	0.0262	0.0214	0.0244	0.0247	
H (MOL %)	0.0006	0.0007	0.0009	0.0010	0.0003	0.0004	0.0006	
CH4 (MOL %)	0.0000	0.0001	0.0002	0.0003	0.0000	0.0000	0.0001	
NO (MOL %)	0.1005	0.0750	0.0546	0.0439	0.0856	0.0729	0.0548	
C(S) (MOL %)	23.3883	29.8583	35.8496	41.4723	23.5740	30.0434	36.0036	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-22>> **********

EXPLOSIVES	HMX 20 TNT 80	#PETN 80 TNT 20	#PETN 60 TNT 40	#PETN 40 TNT 60	#PETN 20 TNT 80	#TETRYL 80 TNT 20	#TETRYL 60 TNT 40	#
RHO (G/CC)	1.698	1.738	1.716	1.695	1.674	1.714	1.699	
EO (KCAL/MOLE)	-3.79	-33.44	-26.64	-19.84	-13.05	1.00	-0.81	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
C	2.7356	1.8816	2.1817	2.4818	2.7818	2.5666	2.6954	
H	2.3013	2.4647	2.3989	2.3330	2.2672	1.8333	1.9253	
N	1.5969	1.2764	1.2875	1.2986	1.3097	1.6572	1.5731	
O	2.6535	3.5650	3.3341	3.1033	2.8724	2.7571	2.7283	
DETN.VEL (M/SEC)	7394.8	8023.7	7766.8	7514.3	7260.5	7530.2	7400.0	
PARTICL.VEL(")	1914.6	2004.0	1982.0	1973.8	1840.4	1937.8	1892.2	
C-J PRESS (KBAR)	240.4	279.5	264.2	251.4	223.7	250.1	237.9	
C-J VOLUME (CC/G)	0.43644	0.43167	0.43404	0.43500	0.44595	0.43329	0.43808	
C-J TEMP (DEG K)	3466.7	3627.1	3603.1	3576.4	3477.5	3709.1	3630.5	
C-J S(CAL/DEG MOL)	62.03	57.68	59.31	61.05	62.66	62.08	62.68	
C-J ENERGY (CAL/G)	438.07	479.92	469.43	465.58	404.79	448.73	427.85	
GAMMA	2.862	3.004	2.919	2.807	2.945	2.886	2.911	
C-J DETN.HEAT(CAL)	1316.6	1454.7	1409.7	1365.4	1320.1	1379.6	1353.7	
LAMDA	9.3458	9.8557	9.7554	9.6486	9.5281	9.8938	9.7748	
VOLUM(K LITTRE/KG)	0.6697	0.7527	0.7226	0.6920	0.6624	0.6651	0.6569	
TOTAL PRODCT(MOLE)	4.6839	3.7535	4.0256	4.2977	4.5693	4.3125	4.4445	
V GAS (MOLES)	2.7375	3.0766	2.9535	2.8287	2.7076	2.7188	2.6852	
V GAS (CC/MOLE)	13.5235	13.3257	13.5039	13.6385	14.0668	13.9655	14.0704	
V SOL C(S) (CC/G)	0.28334	0.26684	0.27342	0.27891	0.29105	0.28006	0.28521	
H2O (MOL %)	24.3739	32.6520	29.6047	26.9458	24.5862	21.0464	21.4424	
CO2 (MOL %)	15.3570	30.0673	25.5229	21.5905	18.0728	20.1903	18.7735	
CO (MOL %)	1.4928	2.0287	2.0422	1.9742	2.0624	2.3689	2.2884	
N2 (MOL %)	16.9981	16.9287	15.9270	15.0509	14.2840	19.1426	17.6361	
H2 (MOL %)	0.0993	0.0855	0.0955	0.1023	0.1249	0.1057	0.1144	
O2 (MOL %)	0.0013	0.0053	0.0037	0.0027	0.0013	0.0034	0.0023	
NH3 (MOL %)	0.0532	0.0459	0.0484	0.0499	0.0552	0.0538	0.0554	
OH (MOL %)	0.0249	0.0495	0.0431	0.0372	0.0273	0.0431	0.0362	
H (MOL %)	0.0008	0.0010	0.0011	0.0011	0.0010	0.0014	0.0013	
CH4 (MOL %)	0.0002	0.0001	0.0002	0.0002	0.0003	0.0002	0.0003	
NO (MOL %)	0.0439	0.1015	0.0803	0.0642	0.0396	0.0883	0.0661	
C(S) (MOL %)	41.5548	18.0343	26.6309	34.1812	40.7449	36.9561	39.5836	

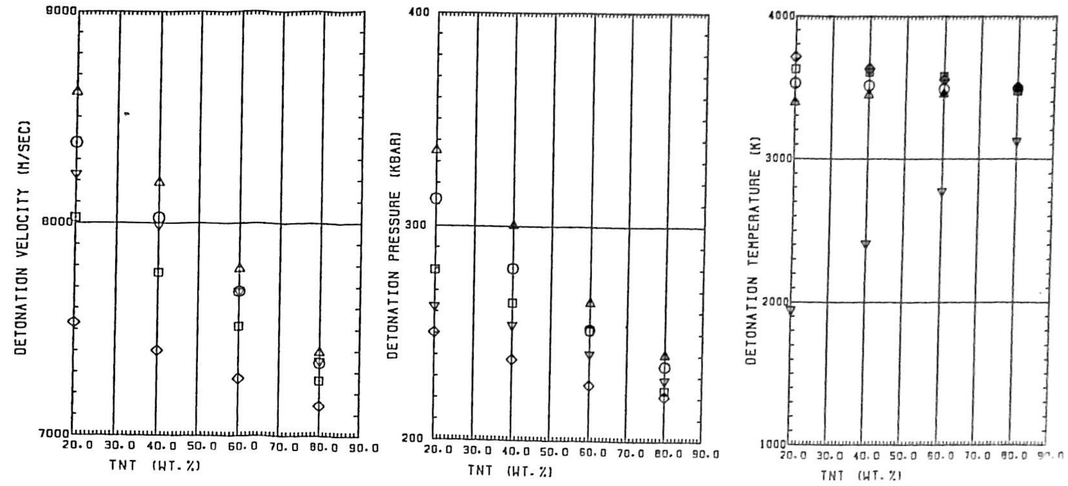
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-22>> **********

EXPLOSIVES	TETRYL 40 TNT 60	#TETRYL 20 TNT 80	#AN 20 TNT 80	#AN 40 TNT 60	#AN 60 TNT 20	#AN 80 TNT 20	#
RHO (G/CC)	1.684	1.669	1.667	1.680	1.693	1.706	
EO (KCAL/MOLE)	-2.63	-4.44	-26.81	-47.37	-67.92	-88.48	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	
C	2.8242	2.9531	2.4655	1.8491	1.2327	0.6164	
H	2.0173	2.1093	2.7605	3.3197	3.8789	4.4381	
N	1.4890	1.4049	1.5564	1.7919	2.0275	2.2631	
O	2.6994	2.6705	2.8629	3.0841	3.3054	3.5267	
DETN.VEL (M/SEC)	7269.5	7142.3	7354.1	7679.4	7989.3	8229.3	
PARTICL.VEL(")	1845.7	1853.8	1864.2	1866.6	1877.0	1869.4	
C-J PRESS (KBAR)	225.9	221.0	228.5	240.8	253.9	262.4	
C-J VOLUME (CC/G)	0.44306	0.44364	0.44781	0.45056	0.45190	0.45301	
C-J TEMP (DEG K)	3551.5	3502.7	3123.0	2773.4	2409.8	1945.8	
C-J S(CAL/DEG MOL)	63.28	63.99	58.67	53.48	48.92	44.46	
C-J ENERGY (CAL/G)	407.09	410.70	415.31	416.35	421.02	417.60	
GAMMA	2.939	2.853	2.945	3.114	3.256	3.402	
C-J DETN.HEAT(CAL)	1327.7	1302.2	1216.7	1151.7	1083.1	975.9	
LAMDA	9.6529	9.5299	9.0896	8.8300	8.6145	8.3899	
VOLUM(K LITTRE/KG)	0.6487	0.6400	0.7150	0.8015	0.8901	0.9797	
TOTAL PRODCT(MOLE)	4.5767	4.7091	4.6227	4.4042	4.1856	4.0045	
V GAS (MOLES)	2.6515	2.6159	2.9225	3.2761	3.6382	4.0045	
V GAS (CC/MOLE)	14.1779	14.1492	13.3162	12.5944	11.9280	11.3127	
V SOL C(S) (CC/G)	0.29034	0.29243	0.28721	0.28012	0.27282	0.26712	
H2O (MOL %)	21.8141	22.1703	29.7180	37.6213	46.3134	55.4158	
CO2 (MOL %)	17.4405	16.2107	15.6281	16.0226	16.2820	15.3930	
CO (MOL %)	2.2042	2.0486	0.9267	0.3494	0.0898	0.0000	
N2 (MOL %)	16.2144	14.8685	16.8044	20.3283	24.2141	28.1705	
H2 (MOL %)	0.1234	0.1262	0.0729	0.0307	0.0085	0.0000	
O2 (MOL %)	0.0016	0.0012	0.0004	0.0001	0.0000	0.8465	
NH3 (MOL %)	0.0569	0.0568	0.0410	0.0229	0.0090	0.0000	
OH (MOL %)	0.0302	0.0266	0.0108	0.0036	0.0008	0.0011	
H (MOL %)	0.0012	0.0011	0.0003	0.0001	0.0000	0.0000	
CH4 (MOL %)	0.0003	0.0004	0.0001	0.0000	0.0000	0.0000	
NO (MOL %)	0.0488	0.0398	0.0179	0.0077	0.0023	0.1730	
C(S) (MOL %)	42.0646	44.4499	36.7794	25.6135	13.0801	0.0	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	AN/OIL 98/ 2	#AN/OIL 96/ 4	#AN/OIL 94/ 6	#AN/OIL 92/ 8	#AN/OIL 90/10	#AN/OIL 98/ 2	#AN/OIL 96/ 4	#
RHO (G/CC)	0.880	0.880	0.880	0.880	0.880	0.800	0.800	
EO (KCAL/MOLE)	-107.66	-106.28	-104.89	-103.51	-102.13	-107.66	-106.28	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000	
C	0.1426	0.2852	0.4277	0.5703	0.7129	0.1426	0.2852	
H	5.1825	5.3677	5.5529	5.7381	5.9234	5.1825	5.3677	
N	2.4487	2.3987	2.3487	2.2987	2.2488	2.4487	2.3987	
O	3.6730	3.5980	3.5231	3.4481	3.3732	3.6730	3.5980	
DETN.VEL (M/SEC)	4716.7	5005.1	5212.5	5252.0	5264.9	4424.1	4696.3	
PARTICL.VEL(")	1241.7	1328.3	1397.2	1382.8	1395.0	1189.0	1271.0	
C-J PRESS (KBAR)	51.5	58.5	64.1	63.9	64.6	42.1	47.8	
C-J VOLUME (CC/G)	0.83722	0.83480	0.83177	0.83717	0.83528	0.91407	0.91172	
C-J TEMP (DEG K)	1783.7	2237.8	2520.4	2324.3	2212.3	1844.6	2299.2	
C-J S(CAL/DEG MOL)	44.86	47.27	48.41	47.48	47.37	45.45	47.82	
C-J ENERGY (CAL/G)	184.24	210.84	233.30	228.51	232.55	168.94	193.04	
GAMMA	2.799	2.768	2.731	2.798	2.774	2.721	2.695	
C-J DETN.HEAT(CAL)	553.2	751.8	889.5	827.1	796.9	552.8	751.1	
LAMDA	7.6810	7.7621	7.7794	7.7202	7.8280	7.6808	7.7617	
VOLUM(K LITTRE/KG)	1.0658	1.0620	1.0700	1.0986	1.1027	1.0658	1.0620	
TOTAL PRODCT(MOLE)	4.3566	4.3408	4.3735	4.4905	4.5073	4.3566	4.3410	
V GAS (MOLES)	4.3566	4.3408	4.3735	4.4904	4.5073	4.3566	4.3409	
V GAS (CC/MOLE)	19.2172	19.2315	19.0181	18.6434	18.5316	20.9812	21.0029	
H2O (MOL %)	59.4791	61.8129	62.3900	57.3847	53.9450	59.4772	61.8021	
CO2 (MOL %)	3.2742	6.5697	8.3799	7.1769	7.3335	3.2740	6.5690	
CO (MOL %)	0.0000	0.0004	1.3993	5.0445	6.2184	0.0000	0.0008	
N2 (MOL %)	27.9967	27.4041	26.7925	24.9774	23.9709	27.9783	27.3816	
H2 (MOL %)	0.0000	0.0004	0.9146	3.6990	4.3165	0.0000	0.0008	
O2 (MOL %)	9.0329	3.7259	0.0000	0.0000	0.0000	9.0140	3.7016	
NH3 (MOL %)	0.0000	0.0000	0.1163	1.2370	1.9497	0.0000	0.0000	
OH (MOL %)	0.0044	0.0349	0.0043	0.0006	0.0002	0.0073	0.0500	
H (MOL %)	0.0000	0.0000	0.0006	0.0005	0.0003	0.0000	0.0000	
CH4 (MOL %)	0.0000	0.0000	0.0006	0.4734	2.2565	0.0000	0.0000	
NO (MOL %)	0.2126	0.4516	0.0016	0.0001	0.0000	0.2491	0.4942	
CH2O (MOL %)	0.0000	0.0000	0.0004	0.0059	0.0089	0.0000	0.0000	

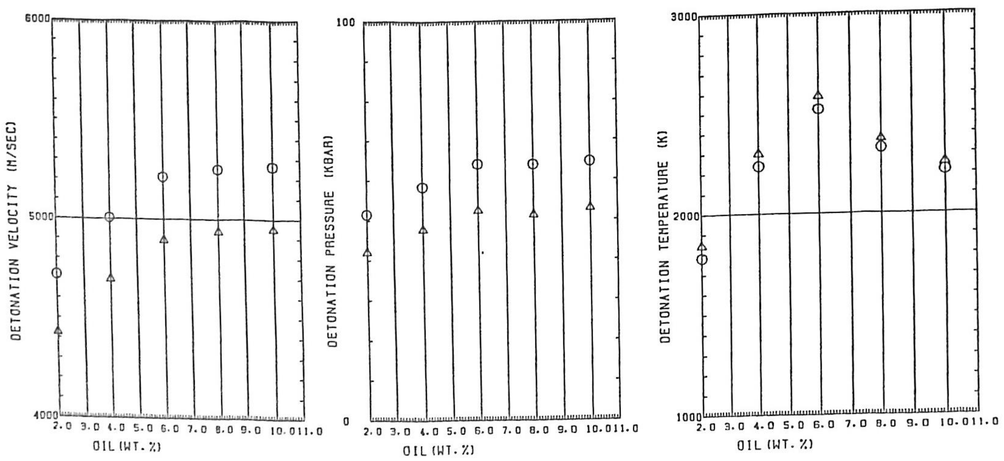
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	AN/OIL 94/ 6	#AN/OIL 92/ 8	#AN/OIL 90/10	#
RHO (G/CC)	0.800	0.800	0.800	
EO (KCAL/MOLE)	-104.89	-103.51	-102.13	
MOL.WEIGHT (G)	100.000	100.000	100.000	
C	0.4277	0.5703	0.7129	
H	5.5529	5.7381	5.9234	
N	2.3487	2.2987	2.2488	
O	3.5231	3.4481	3.3732	
DETN.VEL (M/SEC)	4894.4	4938.2	4950.4	
PARTICL.VEL(")	1339.3	1299.4	1334.6	
C-J PRESS (KBAR)	52.4	51.3	52.9	
C-J VOLUME (CC/G)	0.90796	0.92110	0.91302	
C-J TEMP (DEG K)	2585.3	2368.9	2249.6	
C-J S(CAL/DEG MOL)	48.93	47.75	47.47	
C-J ENERGY (CAL/G)	214.36	201.76	212.83	
GAMMA	2.654	2.800	2.709	
C-J DETN.HEAT(CAL)	889.2	820.5	783.4	
LAMDA	7.7766	7.6724	7.7437	
VOLUM(K LITTRE/KG)	1.0704	1.1056	1.1152	
TOTAL PRODCT(MOLE)	4.3752	4.5192	4.5583	
V GAS (MOLES)	4.3752	4.5192	4.5583	
V GAS (CC/MOLE)	20.7524	20.3821	20.0300	
H2O (MOL %)	62.3552	57.0087	53.2402	
CO2 (MOL %)	8.3828	6.9374	6.8670	
CO (MOL %)	1.3932	5.4099	7.0166	
N2 (MOL %)	26.7988	24.9325	23.7772	
H2 (MOL %)	0.9756	4.4351	5.5625	
O2 (MOL %)	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.0822	1.0015	1.7796	
OH (MOL %)	0.0077	0.0009	0.0003	
H (MOL %)	0.0010	0.0008	0.0005	
CH4 (MOL %)	0.0002	0.2667	1.7453	
NO (MOL %)	0.0029	0.0001	0.0000	
CH2O (MOL %)	0.0004	0.0064	0.0108	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-29

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

AN/OIL 94/ 6 RHO = 0.8800 G/CC EO = -1.048935E+05 CAL/MOLE

LN P = -3.22297764 E+00 -2.53323555 E+00LN V 4.12336767 E-01LN V*2 -5.86353019 E-02LN V*3 3.03605711 E-03LN V*4

LN T = 7.79998398 E+00 -3.62065792 E-01LN V 7.49907494 E-02LN V*2 -1.63121447 E-02LN V*3 1.09571125 E-03LN V*4

LN E = -1.40813351 E+00 4.39190686 E-01LNP 6.92196488 E-02LN P*2 5.38381189 E-03LN P*3 1.56997674 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (197.281)	0.5635	3412.7 (3088.7)	-1079.8	0.14518 (0.14127)	3.0663	0.0
100.000 (100.058)	0.7094	2764.7 (2790.1)	-473.3	0.11980 (0.12079)	2.8377	734.2
80.000 (80.229)	0.7676	2633.4 (2700.8)	-343.9	0.11439 (0.11577)	2.7639	1077.6
* 64.090 (64.439)	0.8318	2520.4 (2615.8)	-233.3	0.10976 (0.11136)	2.6912	1397.2
60.000 (60.226)	0.8530	2501.9 (2590.2)	-208.9	0.10874 (0.11015)	2.6688	1491.8
50.000 (50.022)	0.9152	2450.3 (2521.6)	-145.0	0.10607 (0.10702)	2.6077	1743.5
40.000 (39.940)	0.9990	2388.6 (2441.5)	-74.1	0.10310 (0.10359)	2.5341	2033.7
30.000 (29.964)	1.1213	2311.6 (2343.7)	6.8	0.09971 (0.09971)	2.4411	2382.4
20.000 (20.036)	1.3283	2206.5 (2214.7)	104.7	0.09562 (0.09513)	2.3130	2833.9
10.000 (10.074)	1.8143	2030.2 (2013.4)	240.2	0.08995 (0.08911)	2.1018	3521.1
8.000 (8.060)	2.0209	1974.3 (1952.7)	277.3	0.08840 (0.08754)	2.0359	3724.8
6.000 (6.035)	2.3366	1902.3 (1876.8)	321.7	0.08654 (0.08572)	1.9526	3977.0
5.000 (5.021)	2.5706	1856.3 (1830.1)	348.3	0.08543 (0.08467)	1.9012	4130.9
4.000 (4.005)	2.9008	1801.0 (1774.3)	378.9	0.08415 (0.08348)	1.8398	4313.8
3.000 (2.992)	3.4107	1730.5 (1704.5)	415.8	0.08260 (0.08207)	1.7638	4540.5
2.000 (1.986)	4.3330	1632.9 (1610.0)	463.8	0.08059 (0.08028)	1.6640	4843.6
1.000 (0.992)	6.7093	1469.6 (1457.4)	537.3	0.07752 (0.07760)	1.5171	5322.0
0.800 (0.793)	7.7909	1420.4 (1409.6)	558.2	0.07665 (0.07681)	1.4765	5468.4
0.600 (0.596)	9.4900	1355.8 (1349.1)	584.6	0.07554 (0.07582)	1.4299	5651.2
0.500 (0.497)	10.7852	1314.8 (1311.2)	600.9	0.07486 (0.07521)	1.4035	5764.1
0.400 (0.398)	12.6552	1265.5 (1265.1)	620.0	0.07406 (0.07447)	1.3748	5899.9
0.300 (0.299)	15.6235	1202.6 (1206.1)	643.7	0.07307 (0.07354)	1.3433	6070.9
0.200 (0.200)	21.1700	1115.4 (1124.0)	675.4	0.07174 (0.07225)	1.3095	6304.1
0.100 (0.101)	35.9538	971.3 (988.2)	725.5	0.06965 (0.07009)	1.2781	6680.6
0.080 (0.080)	42.9308	932.4 (944.6)	738.7	0.06909 (0.06941)	1.2738	6799.8
0.060 (0.060)	53.7675	880.1 (890.8)	756.4	0.06835 (0.06856)	1.2718	6946.7
0.050 (0.050)	62.0203	848.2 (857.6)	767.2	0.06790 (0.06803)	1.2722	7037.6
0.040 (0.040)	73.9127	810.9 (817.8)	779.9	0.06737 (0.06739)	1.2741	7146.9
0.030 (0.030)	92.6954	765.1 (768.1)	795.4	0.06672 (0.06661)	1.2783	7284.3
0.020 (0.020)	127.5116	704.1 (701.9)	815.8	0.06587 (0.06558)	1.2858	7471.1
0.010 (0.010)	219.1206	607.5 (600.4)	846.6	0.06458 (0.06411)	1.2970	7770.4
0.008 (0.008)	260.9775	579.4 (570.9)	855.2	0.06422 (0.06374)	1.2986	7862.2
0.006 (0.006)	325.9578	543.2 (535.8)	865.9	0.06377 (0.06336)	1.2982	7975.7
0.005 (0.005)	375.0723	521.0 (515.0)	872.3	0.06350 (0.06317)	1.2963	8045.3
0.004 (0.004)	445.0098	494.7 (491.2)	879.7	0.06319 (0.06302)	1.2917	8128.2
0.003 (0.003)	554.0352	462.1 (463.2)	888.8	0.06281 (0.06296)	1.2819	8231.1
0.002 (0.002)	752.7878	418.7 (428.6)	900.5	0.06232 (0.06316)	1.2593	8369.0

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

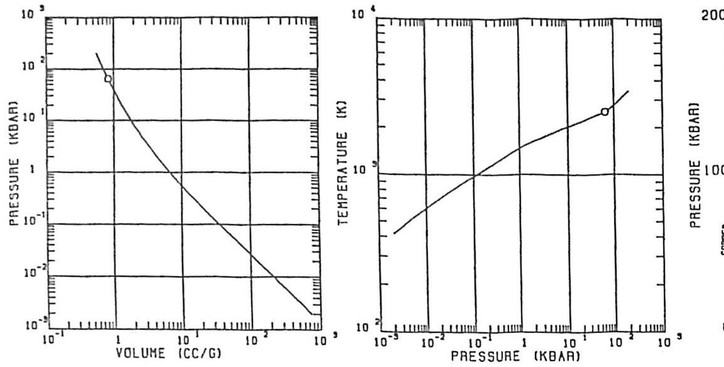
AN/OIL 94/ 6 RHO = 0.8800 G/CC EO = -1.048935E+05 CAL/MOLE

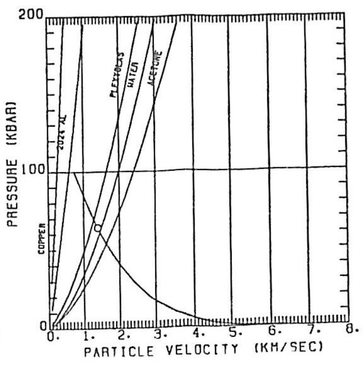
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

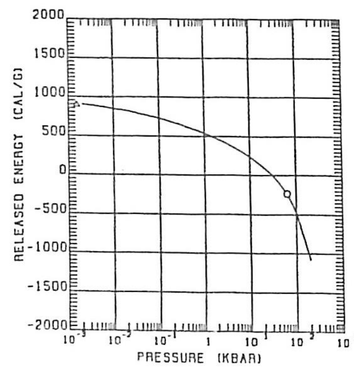
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	CH2O
64.090	2.72866	0.36651	0.06119	1.17178	0.04000	0.00000	0.00509	0.00019	0.00003	0.00003	0.00007	0.00002
60.000	2.72818	0.36699	0.06071	1.17193	0.04093	0.00000	0.00479	0.00018	0.00003	0.00002	0.00006	0.00002
50.000	2.72678	0.36841	0.05931	1.17229	0.04339	0.00000	0.00410	0.00016	0.00002	0.00002	0.00005	0.00002
40.000	2.72502	0.37019	0.05752	1.17263	0.04619	0.00000	0.00343	0.00014	0.00002	0.00001	0.00004	0.00001
30.000	2.72275	0.37251	0.05521	1.17296	0.04946	0.00000	0.00278	0.00011	0.00002	0.00001	0.00003	0.00001
20.000	2.71956	0.37570	0.05206	1.17328	0.05363	0.00000	0.00214	0.00007	0.00001	0.00001	0.00002	0.00001
10.000	2.71441	0.38092	0.04684	1.17361	0.05978	0.00000	0.00150	0.00003	0.00001	0.00000	0.00000	0.00001
8.000	2.71280	0.38255	0.04520	1.17368	0.06159	0.00000	0.00136	0.00002	0.00001	0.00000	0.00000	0.00000
6.000	2.71071	0.38466	0.04311	1.17375	0.06390	0.00000	0.00122	0.00001	0.00000	0.00000	0.00000	0.00000
5.000	2.70938	0.38600	0.04175	1.17378	0.06534	0.00000	0.00115	0.00001	0.00000	0.00000	0.00000	0.00000
4.000	2.70773	0.38765	0.04011	1.17382	0.06710	0.00000	0.00108	0.00001	0.00000	0.00000	0.00000	0.00000
3.000	2.70557	0.38982	0.03795	1.17386	0.06938	0.00000	0.00100	0.00000	0.00000	0.00000	0.00000	0.00000
2.000	2.70248	0.39294	0.03482	1.17390	0.07258	0.00000	0.00093	0.00000	0.00000	0.00001	0.00000	0.00000
1.000	2.69680	0.39859	0.02918	1.17393	0.07834	0.00000	0.00087	0.00000	0.00000	0.00001	0.00000	0.00000
0.800	2.69500	0.40041	0.02734	1.17393	0.08014	0.00000	0.00086	0.00000	0.00000	0.00001	0.00000	0.00000
0.600	2.69253	0.40288	0.02486	1.17393	0.08260	0.00000	0.00087	0.00000	0.00000	0.00002	0.00000	0.00000
0.500	2.69092	0.40450	0.02325	1.17392	0.08417	0.00000	0.00088	0.00000	0.00000	0.00002	0.00000	0.00000
0.400	2.68894	0.40648	0.02126	1.17391	0.08610	0.00000	0.00091	0.00000	0.00000	0.00003	0.00000	0.00000
0.300	2.68644	0.40904	0.01866	1.17389	0.08848	0.00000	0.00095	0.00000	0.00000	0.00006	0.00000	0.00000
0.200	2.68293	0.41261	0.01501	1.17384	0.09168	0.00000	0.00105	0.00000	0.00000	0.00014	0.00000	0.00000
0.100	2.67843	0.41788	0.00901	1.17370	0.09423	0.00000	0.00135	0.00000	0.00000	0.00090	0.00000	0.00000
0.080	2.67808	0.41885	0.00745	1.17366	0.09330	0.00000	0.00142	0.00000	0.00000	0.00149	0.00000	0.00000
0.060	2.67906	0.41940	0.00542	1.17362	0.08918	0.00000	0.00151	0.00000	0.00000	0.00299	0.00000	0.00000
0.050	2.68076	0.41908	0.00426	1.17360	0.08458	0.00000	0.00154	0.00000	0.00000	0.00442	0.00000	0.00000
0.040	2.68392	0.41815	0.00305	1.17361	0.07709	0.00000	0.00153	0.00000	0.00000	0.00659	0.00000	0.00000
0.030	2.68928	0.41605	0.00185	1.17365	0.06530	0.00000	0.00144	0.00000	0.00000	0.00988	0.00000	0.00000
0.020	2.69788	0.41228	0.00079	1.17376	0.04737	0.00000	0.00122	0.00000	0.00000	0.01470	0.00000	0.00000
0.010	2.71080	0.40619	0.00013	1.17399	0.02162	0.00000	0.00078	0.00000	0.00000	0.02146	0.00000	0.00000
0.008	2.71369	0.40479	0.00006	1.17406	0.01600	0.00000	0.00065	0.00000	0.00000	0.02292	0.00000	0.00000
0.006	2.71665	0.40329	0.00002	1.17413	0.01018	0.00000	0.00050	0.00000	0.00000	0.02446	0.00000	0.00000
0.005	2.71814	0.40260	0.00001	1.17418	0.00742	0.00000	0.00042	0.00000	0.00000	0.02516	0.00000	0.00000
0.004	2.71939	0.40193	0.00000	1.17422	0.00489	0.00000	0.00033	0.00000	0.00000	0.02588	0.00000	0.00000
0.003	2.72059	0.40137	0.00000	1.17427	0.00269	0.00000	0.00024	0.00000	0.00000	0.02644	0.00000	0.00000
0.002	2.72153	0.40096	0.00000	1.17432	0.00104	0.00000	0.00014	0.00000	0.00000	0.02688	0.00000	0.00000
80.000	2.73059	0.36440	0.06328	1.17137	0.03683	0.00000	0.00587	0.00027	0.00004	0.00003	0.00012	0.00002
100.000	2.73241	0.36245	0.06523	1.17087	0.03357	0.00000	0.00678	0.00040	0.00005	0.00004	0.00020	0.00002
200.000	2.73521	0.35610	0.07156	1.16831	0.02469	0.00004	0.01021	0.00211	0.00015	0.00005	0.00190	0.00003

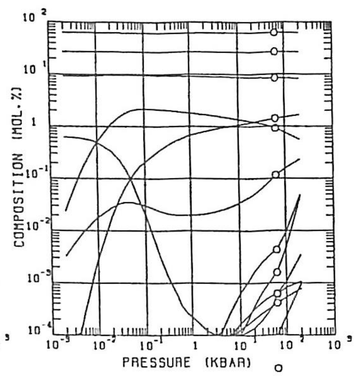
PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT









AN/OIL	94/ 6
RHO (G/CC)	0.880
E_0 (KCAL/MOLE)	-104.89
D_{C-J}(M/SEC)	5213.
P_{C-J}(KBAR)	64.1
T_{C-J}(K)	2520.

DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM 4 C	# NM 15 C	# NM 25 C	# NM 35 C	# NM 4 C,1 KBAR	# NM 4 C,2 KBAR	# NM 4 C,3 KBAR	#
RHO (G/CC)	1.159	1.144	1.131	1.111	1.237	1.314	1.392	
EO (KCAL/MOLE)	-27.56	-27.28	-27.03	-26.65	-27.96	-28.37	-28.77	
MOL.WEIGHT (G)	61.041	61.041	61.041	61.041	61.041	61.041	61.041	
C	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
H	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	
DETN.VEL (M/SEC)	6356.1	6312.3	6272.3	6213.2	6613.5	6880.6	7153.9	
PARTICL.VEL(")	1697.3	1695.8	1723.2	1708.6	1711.3	1771.5	1806.1	
C-J PRESS (KBAR)	125.0	122.5	122.2	117.9	139.9	160.2	179.8	
C-J VOLUME (CC/G)	0.63241	0.63918	0.64137	0.65275	0.59945	0.56506	0.53717	
C-J TEMP (DEG K)	3255.4	3269.1	3295.8	3307.1	3207.2	3168.9	3107.4	
C-J S(CAL/DEG MOL)	54.18	54.17	54.23	54.18	54.17	54.07	53.79	
C-J ENERGY (CAL/G)	344.42	343.65	354.76	348.86	349.98	375.03	389.71	
GAMMA	2.745	2.722	2.640	2.636	2.865	2.884	2.961	
C-J DETN.HEAT(CAL)	1292.1	1292.1	1293.3	1292.3	1303.9	1312.1	1315.6	
LAMDA	7.7848	7.7840	7.7833	7.7822	7.7887	7.7922	7.7951	
VOLUM(K LITTRE/KG)	0.9409	0.9439	0.9458	0.9506	0.9288	0.9192	0.9128	
TOTAL PRODCT(MOLE)	2.9824	2.9811	2.9802	2.9780	2.9878	2.9921	2.9949	
V GAS (MOLES)	2.3476	2.3550	2.3598	2.3717	2.3174	2.2934	2.2774	
V GAS (CC/MOLE)	15.3363	15.4737	15.5080	15.7393	14.6360	13.8655	13.2230	
V SOL C(S) (CC/G)	0.34091	0.34250	0.34281	0.34548	0.33205	0.32084	0.31042	
H2O (MOL %)	47.4981	47.2900	47.1616	46.8189	48.3334	48.9685	49.3721	
CO2 (MOL %)	7.3189	7.2633	7.2208	7.1396	7.5605	7.7794	7.9528	
CO (MOL %)	4.8920	5.2402	5.4709	6.0254	3.4544	2.2886	1.4781	
N2 (MOL %)	16.4900	16.4805	16.4732	16.4591	16.5331	16.5712	16.6005	
H2 (MOL %)	1.9022	2.0685	2.1691	2.4457	1.2372	0.7397	0.4329	
O2 (MOL %)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
NH3 (MOL %)	0.5421	0.5766	0.5992	0.6527	0.3949	0.2695	0.1793	
OH (MOL %)	0.0234	0.0244	0.0263	0.0271	0.0202	0.0177	0.0143	
H (MOL %)	0.0060	0.0066	0.0073	0.0083	0.0037	0.0022	0.0012	
CH4 (MOL %)	0.0333	0.0392	0.0426	0.0539	0.0142	0.0051	0.0017	
NO (MOL %)	0.0083	0.0084	0.0090	0.0088	0.0086	0.0095	0.0096	
C(S) (MOL %)	21.2857	21.0023	20.8201	20.3605	22.4398	23.3487	23.9575	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	ACENINA	#ACENINA/NM 85/15 WT %	#ACENINA/NM 49.3/50.7	#ACENINA/NM 50/50	# SOLID TNT	# LIQUID TNT 93 C	# LIQUID TNT # 114 C
RHO (G/CC)	1.139	1.142	1.149	1.149	1.450	1.450	1.429
EO (KCAL/MOLE)	-50.65	-77.31	-63.80	-64.07	-14.19	-2.64	-0.84
MOL.WEIGHT (G)	61.041	100.000	100.000	100.000	227.134	227.134	227.134
C	1.0000	1.6383	1.6383	1.6383	7.0000	7.0000	7.0000
H	3.0000	4.9148	4.9148	4.9148	5.0000	5.0000	5.0000
N	1.0000	1.6383	1.6383	1.6383	3.0000	3.0000	3.0000
O	2.0000	3.2765	3.2765	3.2765	6.0000	6.0000	6.0000
DETN.VEL (M/SEC)	5788.1	5876.9	6079.6	6076.1	6379.0	6439.9	6387.9
PARTICL.VEL(")	1485.5	1551.8	1613.8	1612.1	1585.4	1686.1	1605.8
C-J PRESS (KBAR)	97.9	104.1	112.7	112.5	146.7	157.5	146.6
C-J VOLUME (CC/G)	0.65263	0.64444	0.63930	0.63942	0.51818	0.50902	0.52388
C-J TEMP (DEG K)	2517.3	2644.4	2903.9	2898.6	3429.2	3582.6	3562.3
C-J S(CAL/DEG MOL)	51.71	52.22	53.14	53.12	63.96	64.49	64.18
C-J ENERGY (CAL/G)	263.73	287.78	311.19	310.55	300.36	339.73	308.15
GAMMA	2.896	2.787	2.767	2.769	3.024	2.819	2.978
C-J DETN.HEAT(CAL)	949.9	1002.5	1124.9	1122.5	1243.8	1291.4	1291.0
LAMDA	7.7983	7.7963	7.7916	7.7917	9.3011	9.2922	9.2678
VOLUM(K LITTRE/KG)	0.9183	0.9209	0.9289	0.9288	0.6517	0.6533	0.6584
TOTAL PRODCT(MOLE)	2.9912	4.8989	4.8937	4.8938	10.9875	10.9879	10.9854
V GAS (MOLES)	2.2912	3.7643	3.7970	3.7963	6.0503	6.0650	6.1130
V GAS (CC/MOLE)	16.0913	15.8531	15,6361	15.6408	16.2236	15.8997	16.3034
V SOL C(S) (CC/G)	0.35306	0.34993	0.34621	0.34629	0.32953	0.32446	0.33031
H2O (MOL %)	48.8457	48.7058	48.2294	48.2396	22.0715	22.0426	21.9168
CO2 (MOL %)	7.9985	7.9073	7.6698	7.6747	13.7234	13.5997	13.2804
CO (MOL %)	2.0179	2.3601	3.3758	3.3541	5.0468	5.2995	6.0816
N2 (MOL %)	16.5807	16.5705	16.5396	16.5402	13.5788	13.5699	13.5663
H2 (MOL %)	0.8707	0.9785	1.3469	1.3391	0.4669	0.4785	0.5806
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0004	0.0007	0.0005
NH3 (MOL %)	0.2697	0.2995	0.3952	0.3932	0.1286	0.1356	0.1527
OH (MOL %)	0.0015	0.0028	0.0077	0.0075	0.0244	0.0352	0.0340
H (MOL %)	0.0004	0.0006	0.0018	0.0018	0.0041	0.0041	0.0047
CH4 (MOL %)	0.0122	0.0135	0.0207	0.0206	0.0030	0.0041	0.0059
NO (MOL %)	0.0005	0.0009	0.0025	0.0025	0.0176	0.0272	0.0236
C(S) (MOL %)	23.4023	23.1606	22.4105	22.4268	44.9347	44.8030	44.3530

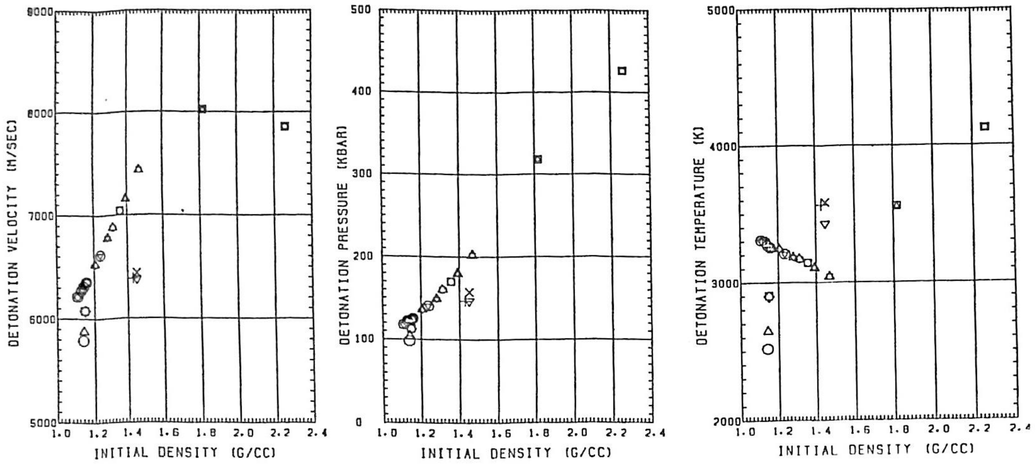
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM 4 C,4 KBAR	# NM 25 C,1 KBAR	# NM 25 C,2 KBAR	# NM 25 C,3 KBAR	# NM(86 KBAR) SHOCKED	# LIQUID TNT # 93 C,125 KAB
RHO (G/CC)	1.469	1.207	1.282	1.358	1.819	2.263
EO (KCAL/MOLE)	-29.18	-27.43	-27.84	-28.24	-5.70	81.40
MOL.WEIGHT (G)	61.041	61.041	61.041	61.041	61.041	227.134
C	1.0000	1.0000	1.0000	1.0000	1.0000	7.0000
H	3.0000	3.0000	3.0000	3.0000	3.0000	5.0000
N	1.0000	1.0000	1.0000	1.0000	1.0000	3.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	6.0000
DETN.VEL (M/SEC)	7430.4	6521.1	6778.4	7041.2	8022.1	7853.1
PARTICL.VEL(")	1850.2	1722.0	1712.3	1781.8	2176.3	2396.2
C-J PRESS (KBAR)	202.0	135.5	148.8	170.3	317.6	425.8
C-J VOLUME (CC/G)	0.51118	0.60992	0.58294	0.55013	0.44100	0.34664
C-J TEMP (DEG K)	3040.5	3245.4	3181.0	3141.9	3554.3	4121.6
C-J S(CAL/DEG MOL)	53.41	54.25	54.11	53.95	54.95	67.24
C-J ENERGY (CAL/G)	408.96	354.34	350.41	379.41	524.54	627.02
GAMMA	3.016	2.787	2.959	2.952	2.686	2.277
C-J DETN.HEAT(CAL)	1316.1	1305.8	1313.9	1319.8	1701.4	1699.6
LAMDA	7.7970	7.7870	7.7906	7.7938	7.7944	9.4272
VOLUM(K LITTRE/KG)	0.9084	0.9332	0.9236	0.9156	0.9059	0.6236
TOTAL PRODCT(MOLE)	2.9969	2.9859	2.9901	2.9936	2.9995	11.0188
V GAS (MOLES)	2.2664	2.3284	2.3045	2.2845	2.2604	5.7899
V GAS (CC/MOLE)	12.6090	14.8542	14.2722	13.5232	10.9256	11.3391
V SOL C(S) (CC/G)	0.29924	0.33478	0.32701	0.31541	0.25042	0.20829
H2O (MOL %)	49.6357	48.0380	48.6767	49.1956	49.7582	22.5809
CO2 (MOL %)	8.0861	7.4617	7.6752	7.8724	8.1042	15.4005
CO (MOL %)	0.9067	3.9877	2.8317	1.8414	0.5924	0.6732
N2 (MOL %)	16.6223	16.5158	16.5530	16.5872	16.5958	13.4581
H2 (MOL %)	0.2387	1.4690	0.9676	0.5656	0.1138	0.0286
O2 (MOL %)	0.0002	0.0001	0.0001	0.0001	0.0025	0.0214
NH3 (MOL %)	0.1137	0.4504	0.3287	0.2200	0.0762	0.0281
OH (MOL %)	0.0112	0.0226	0.0185	0.0161	0.0424	0.0726
H (MOL %)	0.0006	0.0047	0.0029	0.0017	0.0011	0.0008
CH4 (MOL %)	0.0005	0.0198	0.0087	0.0030	0.0001	0.0000
NO (MOL %)	0.0096	0.0091	0.0088	0.0097	0.0711	0.2817
C(S) (MOL %)	24.3748	22.0213	22.9282	23.6873	24.6421	47.4540

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



- ○ ACENINA
- △ ACENINA/NM 65/15 WT %
- □ ACENINA/NM 49.3/50.7
- ◇ ACENINA/NM 50/50
- ▽ SOLID TNT
- × LIQUID TNT 93 C
- + LIQUID TNT 114 C
- ⓞ NM 4 C
- ⓐ NM 15 C
- ⓑ NM 25 C
- ⓒ NM 35 C
- ⓜ NM 4 C, 1 KBAR
- △ NM 4 C, 2 KBAR
- △ NM 4 C, 3 KBAR
- △ NM 4 C, 4 KBAR
- △ NM 25 C, 1 KBAR
- △ NM 25 C, 2 KBAR
- □ NM 25 C, 3 KBAR
- ⊠ NM (66 KBAR) SHOCKED
- ◘ LIQUID TNT 93 C, 125 KAB

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

LIQUID TNT 93 C RHO = 1.4502 G/CC EO = -2.639000E+03 CAL/MOLE

LN P = -3.64661598 E+00 -2.40039635 E+00LN V 3.45406950 E-01LN V*2 -3.89896333 E-02LN V*3 1.54656242 E-03LN V*4

LN T = 7.80806446 E+00 -4.72492635 E-01LN V 1.45868957 E-01LN V*2 -2.40943730 E-02LN V*3 1.42811774 E-03LN V*4

LN E = -1.54464149 E+00 4.41748440 E-01LNP 7.10365176 E-02LN P*2 5.52020594 E-03LN P*3 1.57479357 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (429.603)	0.3661	4814.7 (4703.1)	-1291.7	0.15404 (0.15048)	3.2189	0.0
300.000 (308.455)	0.4065	4318.9 (4316.4)	-900.5	0.13768 (0.13768)	3.1216	477.0
200.000 (199.895)	0.4684	3818.8 (3871.1)	-513.2	0.12147 (0.12325)	2.9943	1270.5
* 157.468 (156.256)	0.5091	3582.6 (3645.5)	-339.6	0.11421 (0.11631)	2.9220	1686.1
100.000 (97.119)	0.6015	3263.0 (3259.2)	-115.2	0.10482 (0.10560)	2.7826	2421.6
80.000 (77.362)	0.6533	3108.8 (3094.9)	-21.4	0.10089 (0.10129)	2.7161	2741.4
60.000 (57.938)	0.7280	2917.2 (2903.2)	85.8	0.09641 (0.09650)	2.6317	3121.3
50.000 (48.333)	0.7804	2802.0 (2792.1)	146.3	0.09388 (0.09384)	2.5790	3345.6
40.000 (38.824)	0.8505	2667.5 (2666.4)	213.8	0.09105 (0.09092)	2.5153	3603.5
30.000 (28.727)	0.9607	2512.8 (2507.9)	287.6	0.08797 (0.08765)	2.4282	3936.4
20.000 (19.563)	1.1296	2315.3 (2327.6)	377.7	0.08420 (0.08381)	2.3179	4328.4
10.000 (10.098)	1.5211	2046.5 (2066.9)	496.0	0.07925 (0.07881)	2.1308	4930.2
8.000 (8.139)	1.6855	1975.7 (1993.9)	526.9	0.07795 (0.07752)	2.0708	5109.5
6.000 (6.153)	1.9343	1893.1 (1906.8)	563.2	0.07643 (0.07603)	1.9938	5331.3
5.000 (5.143)	2.1186	1845.2 (1855.3)	584.5	0.07555 (0.07517)	1.9451	5467.6
4.000 (4.124)	2.3775	1791.0 (1796.2)	608.8	0.07453 (0.07420)	1.8858	5629.8
3.000 (3.093)	2.7780	1727.0 (1725.8)	637.9	0.07331 (0.07306)	1.8101	5832.5
2.000 (2.055)	3.5062	1646.5 (1637.4)	675.4	0.07174 (0.07161)	1.7056	6106.1
1.000 (1.016)	5.4166	1529.0 (1512.6)	732.6	0.06935 (0.06943)	1.5373	6544.4
0.800 (0.810)	6.2953	1495.3 (1478.6)	749.6	0.06863 (0.06877)	1.4868	6678.9
0.600 (0.604)	7.7005	1453.7 (1438.3)	771.2	0.06773 (0.06794)	1.4250	6848.5
0.500 (0.501)	8.7935	1428.8 (1414.6)	784.2	0.06719 (0.06742)	1.3878	6954.3
0.400 (0.399)	10.3947	1399.0 (1387.3)	800.2	0.06652 (0.06679)	1.3448	7082.1
0.300 (0.297)	12.9956	1362.0 (1354.3)	820.4	0.06567 (0.06598)	1.2937	7244.2
0.200 (0.196)	18.0413	1312.2 (1311.2)	848.3	0.06451 (0.06483)	1.2311	7468.1
0.100 (0.098)	32.4590	1232.9 (1241.8)	894.5	0.06258 (0.06285)	1.1522	7838.2
0.080 (0.078)	39.4081	1209.0 (1219.8)	908.6	0.06198 (0.06221)	1.1344	7954.2
0.060 (0.059)	50.7070	1179.2 (1191.1)	926.6	0.06123 (0.06137)	1.1168	8101.5
0.050 (0.049)	59.5424	1160.9 (1172.8)	937.9	0.06076 (0.06085)	1.1085	8193.7
0.040 (0.040)	72.5446	1139.1 (1150.1)	951.3	0.06020 (0.06021)	1.1013	8305.6
0.030 (0.030)	93.6058	1111.5 (1120.7)	968.6	0.05947 (0.05940)	1.0961	8448.0
0.020 (0.020)	134.3594	1074.8 (1078.9)	991.8	0.05850 (0.05830)	1.0960	8646.6
0.010 (0.010)	249.8677	1015.9 (1010.1)	1029.2	0.05694 (0.05659)	1.1107	8980.5
0.008 (0.008)	305.2495	997.9 (989.7)	1040.7	0.05646 (0.05611)	1.1183	9086.4
0.006 (0.006)	395.2402	975.3 (965.6)	1055.2	0.05585 (0.05554)	1.1292	9221.9
0.005 (0.005)	465.6121	961.3 (951.8)	1064.2	0.05547 (0.05523)	1.1367	9307.0
0.004 (0.004)	569.0740	944.5 (937.0)	1075.0	0.05502 (0.05490)	1.1460	9410.4
0.003 (0.003)	737.1755	923.2 (921.8)	1088.5	0.05446 (0.05456)	1.1578	9542.0
0.002 (0.002)	1061.8599	894.1 (909.8)	1107.0	0.05368 (0.05430)	1.1731	9724.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

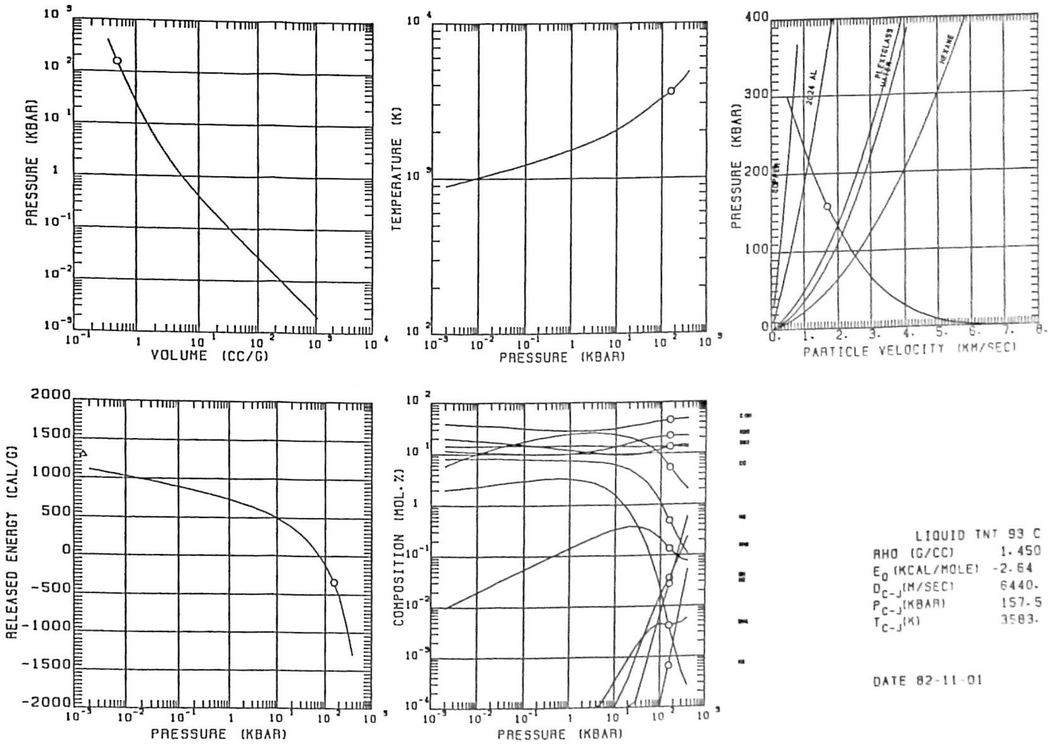
LIQUID TNT 93 C RHO = 1.4502 G/CC EO = -2.639000E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)
157.468	2.42184	1.49384	0.58347	1.49104	0.05272	0.00007	0.01492	0.00387	0.00045	0.00045	0.00299	4.92224
100.000	2.33967	1.33660	0.98454	1.48793	0.11941	0.00001	0.02337	0.00179	0.00048	0.00236	0.00077	4.67650
80.000	2.28280	1.26115	1.19337	1.48597	0.16541	0.00000	0.02769	0.00114	0.00045	0.00473	0.00038	4.54074
60.000	2.19284	1.17429	1.45782	1.48348	0.23635	0.00000	0.03289	0.00060	0.00038	0.01049	0.00015	4.35744
50.000	2.12712	1.12794	1.61653	1.48210	0.28619	0.00000	0.03572	0.00039	0.00032	0.01638	0.00008	4.23920
40.000	2.04040	1.08297	1.79340	1.48080	0.34866	0.00000	0.03836	0.00023	0.00025	0.02658	0.00004	4.09712
30.000	1.92356	1.04158	1.99316	1.47994	0.42763	0.00000	0.04010	0.00011	0.00018	0.04426	0.00001	3.92105
20.000	1.74525	1.00930	2.23611	1.47979	0.52935	0.00000	0.04042	0.00004	0.00010	0.08235	0.00000	3.67224
10.000	1.46614	1.01098	2.51189	1.48233	0.64898	0.00000	0.03533	0.00001	0.00003	0.16593	0.00000	3.31119
8.000	1.38999	1.02104	2.56794	1.48351	0.67407	0.00000	0.03298	0.00000	0.00002	0.19323	0.00000	3.21779
6.000	1.30503	1.03950	2.61599	1.48508	0.69848	0.00000	0.02984	0.00000	0.00002	0.22586	0.00000	3.11865
5.000	1.25833	1.05349	2.63472	1.48606	0.71060	0.00000	0.02788	0.00000	0.00001	0.24462	0.00000	3.06717
4.000	1.20865	1.07267	2.64603	1.48721	0.72268	0.00000	0.02557	0.00000	0.00001	0.26515	0.00000	3.01615
3.000	1.15533	1.10017	2.64435	1.48859	0.73509	0.00000	0.02282	0.00000	0.00001	0.28768	0.00000	2.96780
2.000	1.09807	1.14348	2.61501	1.49031	0.74851	0.00000	0.01939	0.00000	0.00000	0.31217	0.00000	2.92934
1.000	1.03753	1.22650	2.50951	1.49266	0.76621	0.00000	0.01469	0.00000	0.00000	0.33711	0.00000	2.92687
0.800	1.02621	1.25544	2.46295	1.49328	0.77133	0.00000	0.01344	0.00000	0.00000	0.34116	0.00000	2.94045
0.600	1.01694	1.29480	2.39351	1.49402	0.77755	0.00000	0.01198	0.00000	0.00000	0.34377	0.00000	2.96792
0.500	1.01308	1.31935	2.34828	1.49444	0.78226	0.00000	0.01113	0.00000	0.00000	0.34398	0.00000	2.98839
0.400	1.01139	1.35100	2.28666	1.49492	0.78767	0.00000	0.01017	0.00000	0.00000	0.34284	0.00000	3.01950
0.300	1.01292	1.39308	2.20097	1.49549	0.79482	0.00000	0.00903	0.00000	0.00000	0.33936	0.00000	3.06659
0.200	1.02070	1.45421	2.07094	1.49619	0.80528	0.00000	0.00763	0.00000	0.00000	0.33129	0.00000	3.14356
0.100	1.04372	1.56124	1.83386	1.49717	0.82313	0.00000	0.00567	0.00000	0.00000	0.31232	0.00000	3.29259
0.080	1.05216	1.59529	1.75732	1.49743	0.82905	0.00000	0.00515	0.00000	0.00000	0.30553	0.00000	3.34187
0.060	1.06372	1.63922	1.65791	1.49773	0.83614	0.00000	0.00454	0.00000	0.00000	0.29666	0.00000	3.40623
0.050	1.07133	1.66704	1.59467	1.49791	0.84024	0.00000	0.00420	0.00000	0.00000	0.29107	0.00000	3.44722
0.040	1.08048	1.70041	1.51877	1.49810	0.84530	0.00000	0.00381	0.00000	0.00000	0.28426	0.00000	3.49660
0.030	1.09332	1.74433	1.41811	1.49833	0.85001	0.00000	0.00336	0.00000	0.00000	0.27582	0.00000	3.56177
0.020	1.11031	1.80292	1.28392	1.49860	0.85704	0.00000	0.00281	0.00000	0.00000	0.26422	0.00000	3.64896
0.010	1.13949	1.89786	1.06488	1.49897	0.86556	0.00000	0.00207	0.00000	0.00000	0.24592	0.00000	3.79135
0.008	1.14911	1.92682	0.99733	1.49907	0.86711	0.00000	0.00188	0.00000	0.00000	0.24048	0.00000	3.83537
0.006	1.16164	1.96284	0.91277	1.49918	0.86820	0.00000	0.00166	0.00000	0.00000	0.23384	0.00000	3.89056
0.005	1.16985	1.98483	0.86058	1.49924	0.86823	0.00000	0.00153	0.00000	0.00000	0.22982	0.00000	3.92479
0.004	1.18010	2.01081	0.79837	1.49931	0.86755	0.00000	0.00139	0.00000	0.00000	0.22514	0.00000	3.96567
0.003	1.19386	2.04268	0.72089	1.49940	0.86537	0.00000	0.00123	0.00000	0.00000	0.21947	0.00000	4.01695
0.002	1.21451	2.08421	0.61717	1.49950	0.85951	0.00000	0.00103	0.00000	0.00000	0.21223	0.00000	4.08636
200.000	2.44303	1.54770	0.44830	1.49062	0.03496	0.00023	0.01217	0.00623	0.00047	0.00020	0.00658	5.00381
300.000	2.46125	1.60468	0.28745	1.48297	0.01774	0.00153	0.00912	0.01393	0.00052	0.00005	0.02495	5.10782
400.000	2.46203	1.60587	0.22513	1.46374	0.01213	0.00574	0.00845	0.02556	0.00063	0.00003	0.06406	5.16897

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



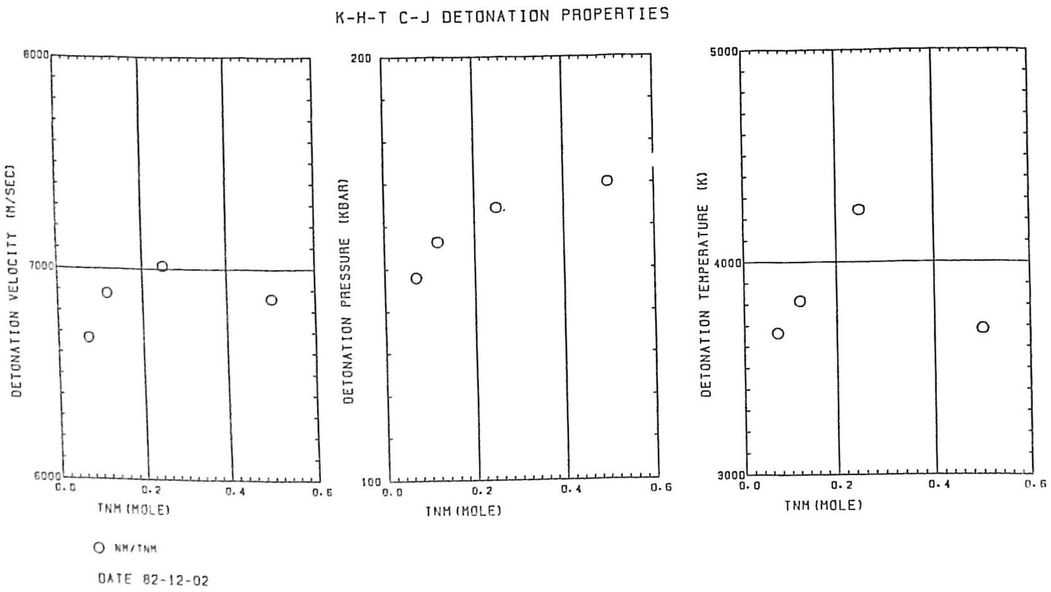
LIQUID TNT 93 C	
RHO (G/CC)	1.450
E_0 (KCAL/MOLE)	-2.64
D_{C-J} (M/SEC)	6440.
P_{C-J} (KBAR)	157.5
T_{C-J} (K)	3583.

DATE 82-11-01

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-12-02>> **********

EXPLOSIVES	NM/TNM 1/0.071	#NM/TNM 1/0.12 MOLE	#NM/TNM 1/0.25	#NM/TNM 1/0.5	#
RHO (G/CC)	1.197	1.235	1.309	1.396	
EO (KCAL/MOLE)	-26.40	-25.97	-24.83	-22.63	
MOL.WEIGHT (G)	74.959	84.565	110.049	159.057	
C	1.0710	1.1200	1.2500	1.5000	
H	3.0000	3.0000	3.0000	3.0000	
N	1.2840	1.4800	2.0000	3.0000	
O	2.5680	2.9600	4.0000	6.0000	
DETN.VEL (M/SEC)	6671.3	6884.1	7013.2	6861.6	
PARTICL.VEL(")	1852.9	1838.5	1789.8	1775.8	
C-J PRESS (KBAR)	148.0	156.3	164.3	170.1	
C-J VOLUME (CC/G)	0.60339	0.59347	0.56898	0.53095	
C-J TEMP (DEG K)	3665.9	3816.9	4243.3	3683.9	
C-J S(CAL/DEG MOL)	54.51	54.37	56.59	55.03	
C-J ENERGY (CAL/G)	410.29	403.94	382.83	376.84	
GAMMA	2.600	2.744	2.918	2.864	
C-J DETN.HEAT(CAL)	1385.7	1428.6	1542.3	1240.6	
LAMDA	8.4475	8.7887	9.5739	9.8194	
VOLUM(K LITTRE/KG)	0.9265	0.9189	0.8473	0.8093	
TOTAL PRODCT(MOLE)	3.1992	3.3482	3.8114	5.2613	
V GAS (MOLES)	2.8388	3.1762	3.8114	5.2613	
V GAS (CC/MOLE)	15.4293	15.5885	16.4286	16.0513	
V C(S) (CC/G)	0.33011	0.32635	0.32433	0.31830	
H2O (MOL %)	44.4933	42.5831	38.7726	28.2111	
CO2 (MOL %)	13.4753	17.3553	30.1362	28.3819	
CO (MOL %)	8.7144	10.9379	2.6604	0.1287	
N2 (MOL %)	19.8230	21.8639	25.4479	25.8028	
H2 (MOL %)	1.6302	1.5042	0.1966	0.0070	
O2 (MOL %)	0.0008	0.0016	0.4874	11.4694	
NH3 (MOL %)	0.4504	0.4097	0.0178	0.0002	
OH (MOL %)	0.0733	0.1050	0.7075	0.5837	
H (MOL %)	0.0132	0.0168	0.0125	0.0007	
CH4 (MOL %)	0.0222	0.0186	0.0000	0.0000	
NO (MOL %)	0.0387	0.0651	1.5610	5.4144	
C(S) (MOL %)	11.2653	5.1388	0.0	0.0	

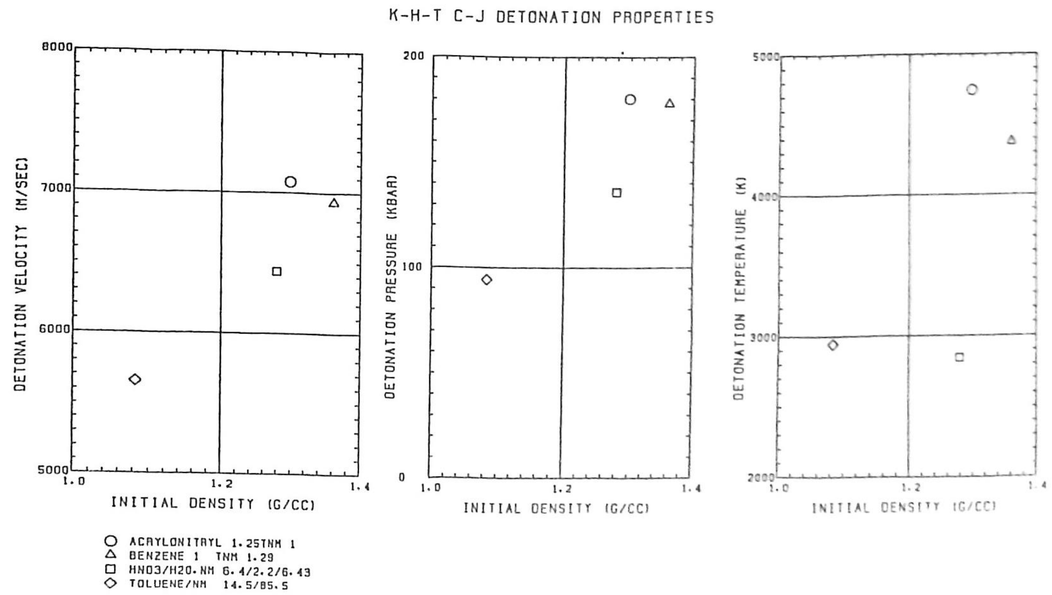
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	ACRYLONITRYL 1.25TNM 1	#BENZENE 1 NM 1.29	T#HNO3/H2O.NM 6.4/2.2/6.43	#TOLUENE/NM 14.5/85.5	#
RHO (G/CC)	1.299	1.361	1.280	1.084	
EO (KCAL/MOLE)	53.66	23.07	-593.78	-37.41	
MOL.WEIGHT (G)	262.363	330.997	838.351	100.000	
C	4.7500	7.2900	6.4340	2.5023	
H	3.7500	6.0000	30.1920	5.4611	
N	5.2500	5.1600	12.8690	1.4007	
O	8.0000	10.3200	34.4005	2.8014	
DETN.VEL (M/SEC)	7077.4	6932.8	6438.7	5655.2	
PARTICL.VEL(")	1959.9	1885.4	1648.2	1535.7	
C-J PRESS (KBAR)	180.2	177.9	135.8	94.1	
C-J VOLUME (CC/G)	0.55664	0.53493	0.58126	0.67200	
C-J TEMP (DEG K)	4744.1	4374.8	2842.9	2943.3	
C-J S(CAL/DEG MOL)	56.81	59.51	51.37	56.09	
C-J ENERGY (CAL/G)	459.03	424.81	324.64	281.82	
GAMMA	2.611	2.677	2.906	2.683	
C-J DETN.HEAT(CAL)	1526.4	1496.1	1036.8	1181.3	
LAMDA	9.9532	9.8067	8.8036	7.0711	
VOLUM(K LITTRE/KG)	0.8092	0.7601	0.9104	0.8875	
TOTAL PRODCT(MOLE)	9.2614	12.8679	31.1962	5.8561	
V GAS (MOLES)	8.6784	10.2839	31.1962	3.6275	
V GAS (CC/MOLE)	16.5713	16.2583	15.6206	15.8821	
V SOL C(S) (CC/G)	0.31859	0.31783	0.33234	0.35823	
H2O (MOL %)	18.5480	21.9765	48.3121	41.2863	
CO2 (MOL %)	22.1144	21.2587	20.6164	2.0203	
CO (MOL %)	22.8677	15.3051	0.0080	2.5043	
N2 (MOL %)	28.0298	19.8489	19.6947	11.4468	
H2 (MOL %)	1.1085	0.8882	0.0011	3.5024	
O2 (MOL %)	0.0157	0.0078	9.3507	0.0000	
NH3 (MOL %)	0.2503	0.2133	0.0000	1.0243	
OH (MOL %)	0.3273	0.1965	0.1548	0.0059	
H (MOL %)	0.0553	0.0269	0.0000	0.0037	
CH4 (MOL %)	0.0110	0.0088	0.0000	0.1486	
NO (MOL %)	0.3770	0.1887	1.8625	0.0010	
C(S) (MOL %)	6.2951	20.0807	0.0	38.0564	

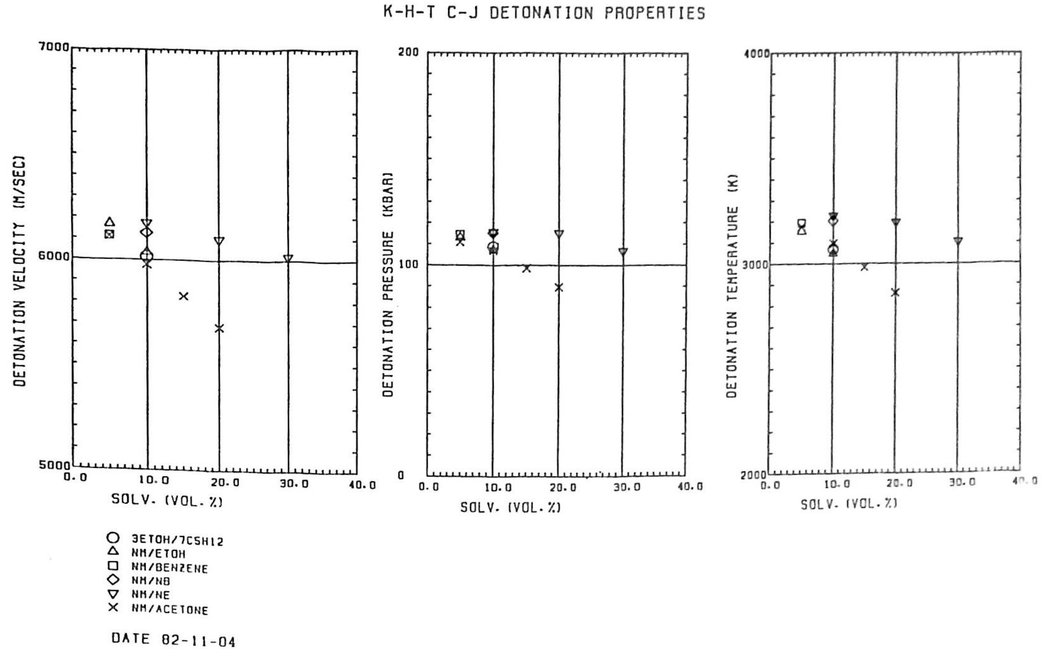
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-04>> **********

EXPLOSIVES		NM/C2H5OH/C5 H12 90/3/7	#NM/C2H5OH 95/5(VOL.%)	#NM/C2H5OH 90/10(VOL.%)	#NM/BENZENE 95/5(VOL.%)	#NM/C6H5NO2 90/10(VOL.%)	#NM/NE 90/10(VOL.%)	#NM/NE 80/20(VOL.%) #
RHO	(G/CC)	1.098	1.121	1.103	1.125	1.145	1.117	1.108
EO	(KCAL/MOLE)	-53.71	-53.09	-56.23	-47.45	-44.58	-49.44	-48.93
MOL.WEIGHT	(G)	108.871	111.108	109.416	111.559	113.500	112.050	111.300
C		2.0363	1.9269	2.0059	2.0935	2.2470	1.9437	2.0395
H		6.0222	5.7808	6.0178	5.6046	5.4760	5.6908	5.8378
N		1.6632	1.7556	1.6632	1.7556	1.7605	1.8034	1.7589
O		3.4406	3.5968	3.4977	3.5111	3.5209	3.6069	3.5178
DETN.VEL	(M/SEC)	6015.8	6167.5	6035.5	6114.7	6127.9	6175.0	6099.5
PARTICL.VEL	(")	1644.9	1635.5	1612.2	1663.8	1640.4	1674.8	1702.9
C-J PRESS	(KBAR)	108.6	113.1	107.3	114.5	115.1	115.5	115.1
C-J VOLUME	(CC/G)	0.66173	0.65551	0.66445	0.64702	0.63957	0.65245	0.65056
C-J TEMP	(DEG K)	3070.3	3154.2	3048.4	3193.8	3203.5	3227.6	3196.1
C-J S	(CAL/DEG MOL)	54.20	54.08	54.01	54.80	55.33	54.31	54.56
C-J ENERGY	(CAL/G)	323.31	319.56	310.59	330.84	321.56	335.23	346.49
GAMMA		2.657	2.771	2.744	2.675	2.736	2.687	2.582
C-J DETN.HEAT	(CAL)	1234.1	1261.6	1228.7	1261.3	1261.8	1278.0	1266.6
LAMDA		7.3322	7.5791	7.3723	7.6100	7.6830	7.6426	7.5006
VOLUM	(K LITTRE/KG)	0.9495	0.9485	0.9512	0.9261	0.9055	0.9451	0.9416
TOTAL PRODCT	(MOLE)	5.8266	5.6528	5.7971	5.7315	5.8262	5.6479	5.7904
V GAS	(MOLES)	4.2255	4.3076	4.2543	4.2231	4.2008	4.3288	4.2838
V GAS	(CC/MOLE)	15.4582	15.6046	15.5628	15.6040	15.6699	15.6204	15.4388
V C(S)	(CC/G)	0.34974	0.34751	0.35043	0.34690	0.34657	0.34646	0.34653
H2O	(MOL %)	47.7015	47.6606	48.0865	45.4914	43.8464	46.8287	46.6915
CO2	(MOL %)	3.9355	5.7111	4.3131	5.5904	5.9414	6.0035	4.8957
CO	(MOL %)	3.4637	4.5246	3.6102	4.5651	4.6807	5.0000	4.2475
N2	(MOL %)	13.8867	15.1988	13.9801	14.9910	14.8101	15.6291	14.8288
H2	(MOL %)	2.6755	2.3719	2.5856	2.3201	2.1560	2.4276	2.5158
O2	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
NH3	(MOL %)	0.7681	0.6537	0.7268	0.6425	0.5906	0.6665	0.7136
OH	(MOL %)	0.0117	0.0166	0.0112	0.0180	0.0183	0.0207	0.0179
H	(MOL %)	0.0046	0.0055	0.0043	0.0059	0.0057	0.0067	0.0062
CH4	(MOL %)	0.0708	0.0540	0.0671	0.0528	0.0473	0.0551	0.0598
NO	(MOL %)	0.0029	0.0048	0.0027	0.0053	0.0056	0.0062	0.0051
C(S)	(MOL %)	27.4791	23.7984	26.6124	26.3176	27.8980	23.3559	26.0182

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-04>> **********

EXPLOSIVES		NM/NE 70/30(VOL.%)	#NM/ACETONE 95/5 (VOL.%)	#NM/ACETONE 90/10(VOL.%)	#NM/ACETONE 85/15(VOL.%)	#NM/ACETONE 80/20(VOL.%) #
RHO	(G/CC)	1.100	1.109	1.094	1.077	1.060
EO	(KCAL/MOLE)	-48.42	-51.45	-52.96	-54.47	-55.97
MOL.WEIGHT	(G)	110.550	111.083	109.366	107.649	105.932
C		2.1352	1.9582	2.0684	2.1787	2.2889
H		5.9848	5.6719	5.8000	5.9281	6.0561
N		1.7144	1.7556	1.6632	1.5708	1.4784
O		3.4288	3.5787	3.4614	3.3441	3.2269
DETN.VEL	(M/SEC)	6019.1	6111.9	5976.3	5828.8	5683.5
PARTICL.VEL	(")	1613.2	1636.2	1634.2	1569.9	1489.5
C-J PRESS	(KBAR)	106.8	110.9	106.8	98.6	89.7
C-J VOLUME	(CC/G)	0.66544	0.66032	0.66413	0.67842	0.69616
C-J TEMP	(DEG K)	3104.4	3176.1	3095.2	2982.5	2860.9
C-J S	(CAL/DEG MOL)	54.53	54.24	54.42	54.43	54.35
C-J ENERGY	(CAL/G)	311.01	319.98	319.13	294.53	265.12
GAMMA		2.731	2.735	2.657	2.713	2.816
C-J DETN.HEAT	(CAL)	1250.5	1258.2	1227.1	1191.9	1154.2
LAMDA		7.3619	7.6217	7.4552	7.2875	7.1207
VOLUM	(K LITTRE/KG)	0.9414	0.9442	0.9389	0.9358	0.9334
TOTAL PRODCT	(MOLE)	5.9274	5.6282	5.7514	5.8701	5.9845
V GAS	(MOLES)	4.2537	4.2870	4.1972	4.1174	4.0414
V GAS	(CC/MOLE)	15.6350	15.7988	15.7442	15.9194	16.1651
V C(S)	(CC/G)	0.35110	0.34899	0.35102	0.35556	0.36062
H2O	(MOL %)	46.2124	46.7457	46.5679	46.1357	45.5347
CO2	(MOL %)	3.9153	5.9154	4.7292	3.6638	2.7406
CO	(MOL %)	3.7881	4.9866	4.1414	3.4966	2.8987
N2	(MOL %)	14.0532	15.2582	14.0992	12.9769	11.8893
H2	(MOL %)	2.8772	2.5037	2.6317	2.9563	3.3968
O2	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	(MOL %)	0.8134	0.6708	0.7159	0.8028	0.9235
OH	(MOL %)	0.0128	0.0177	0.0130	0.0084	0.0051
H	(MOL %)	0.0054	0.0061	0.0050	0.0040	0.0030
CH4	(MOL %)	0.0826	0.0607	0.0701	0.0954	0.1387
NO	(MOL %)	0.0031	0.0050	0.0033	0.0018	0.0009
C(S)	(MOL %)	28.2365	23.8300	27.0232	29.8583	32.4687

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-04>> **********

EXPLOSIVES		ACETONITRILE /HNO3 30/70	#ACETONITRILE /HNO3 40/60	#ACETONITRILE /HNO3 50/50	#ACETONITRILE /HNO3 60/40	#ACETONITRILE /HNO3 5/11 M HNO3	#ACETNITRILE+# H2O
RHO	(G/CC)	1.299	1.226	1.152	1.079	1.252	1.139
EO	(KCAL/MOLE)	-62.97	-50.51	-38.05	-25.60	-394.16	-101.30
MOL.WEIGHT	(G)	129.929	122.572	115.215	107.858	898.406	122.081
C		1.1463	1.5284	1.9105	2.2926	10.0000	2.0000
H		3.4080	3.7399	4.0718	4.4037	26.0000	6.0000
N		2.2617	2.2115	2.1613	2.1112	16.0000	2.0000
O		5.0656	4.3420	3.6183	2.8946	33.0000	4.0000
DETN.VEL	(M/SEC)	6420.6	6698.8	6238.5	5724.9	6642.7	5789.2
PARTICL.VEL	(")	1666.5	1756.2	1723.0	1541.9	1724.4	1466.3
C-J PRESS	(KBAR)	139.0	144.2	123.8	95.2	143.4	96.7
C-J VOLUME	(CC/G)	0.57001	0.60182	0.62832	0.67718	0.59138	0.65559
C-J TEMP	(DEG K)	3137.8	3686.5	3457.8	3149.8	3870.8	2509.8
C-J S	(CAL/DEG MOL)	53.08	53.90	54.78	55.57	55.65	51.69
C-J ENERGY	(CAL/G)	331.90	368.58	354.76	284.10	355.36	256.94
GAMMA		2.853	2.814	2.621	2.713	2.852	2.948
C-J DETN.HEAT	(CAL)	1076.4	1322.3	1243.8	1162.6	1387.5	949.5
LAMDA		9.3815	9.1803	8.5835	7.9328	9.5105	7.7983
VOLUM	(K LITTRE/KG)	0.8510	0.8970	0.8866	0.8705	0.8530	0.9186
TOTAL PRODCT	(MOLE)	4.5195	4.4942	5.0032	5.4985	31.3247	5.9821
V GAS	(MOLES)	4.5195	4.4942	4.1753	3.8378	31.3246	4.5838
V GAS	(CC/MOLE)	16.3868	16.4138	16.5216	17.1667	16.9610	16.1640
V C(S)	(CC/G)	0.33220	0.33231	0.34282	0.35886	0.33381	0.35386
H2O	(MOL %)	37.5624	39.9255	38.1952	35.8918	41.1223	48.8217
CO2	(MOL %)	25.3339	22.5379	12.4564	5.3390	30.2149	7.9982
CO	(MOL %)	0.0293	11.4601	9.1515	6.0576	1.7088	2.0463
N2	(MOL %)	23.5379	24.4324	21.3641	18.8160	25.0375	16.5793
H2	(MOL %)	0.0026	1.1894	1.7346	2.8144	0.1390	0.8902
O2	(MOL %)	10.2903	0.0016	0.0003	0.0000	0.3258	0.0000
NH3	(MOL %)	0.0000	0.2825	0.4515	0.7592	0.0101	0.2738
OH	(MOL %)	0.2766	0.0878	0.0406	0.0137	0.4428	0.0015
H	(MOL %)	0.0001	0.0122	0.0095	0.0064	0.0061	0.0004
CH4	(MOL %)	0.0000	0.0098	0.0299	0.0949	0.0000	0.0129
NO	(MOL %)	2.9668	0.0609	0.0194	0.0040	0.9929	0.0004
C(S)	(MOL %)	0.0	0.0	16.5471	30.2029	0.0	23.3755

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C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J), - EO
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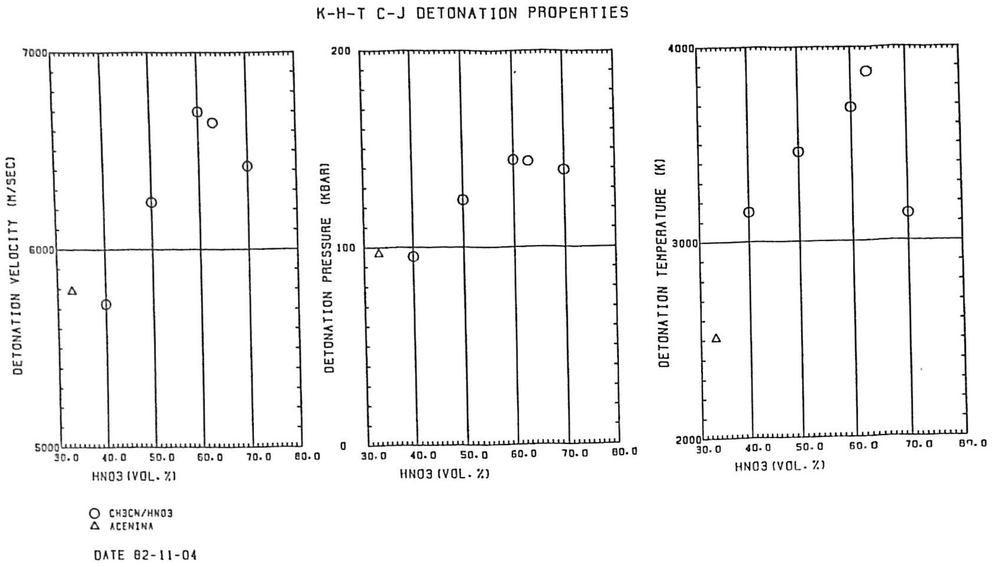
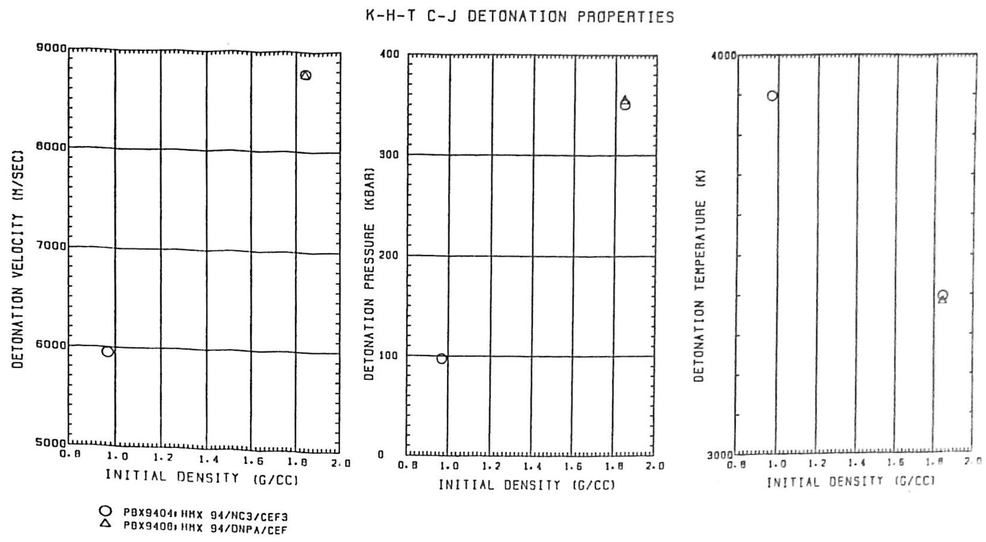


********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	PBX9404;HMX 94/NC3/CEF3	#PBX9404;HMX 94/NC3/CEF3	#PBX9408;HMX # 94/DNPA/CEF
RHO (G/CC)	1.844	0.969	1.842
EO (KCAL/MOLE)	3.75	3.75	4.26
MOL.WEIGHT (G)	100.000	100.000	100.300
C	1.4012	1.4012	1.4078
H	2.7452	2.7452	2.7318
N	2.5649	2.5649	2.6310
O	2.6897	2.6897	2.6646
CL	0.0315	0.0315	0.0252
P	0.0105	0.0105	0.0084
DETN.VEL (M/SEC)	8776.9	5948.5	8766.5
PARTICL.VEL(")	2167.0	1692.5	2195.7
C-J PRESS (KBAR)	350.7	97.6	354.6
C-J VOLUME (CC/G)	0.40841	0.73837	0.40691
C-J TEMP (DEG K)	3396.3	3897.2	3381.8
C-J S(CAL/DEG MOL)	53.61	52.72	53.45
C-J ENERGY (CAL/G)	561.16	342.31	576.13
GAMMA	3.050	2.515	2.993
C-J DETN.HEAT(CAL)	1451.7	1246.0	1438.5
LAMDA	9.2017	8.8566	9.1793
VOLUM(K LITTRE/KG)	0.8143	0.9438	0.8156
TOTAL PRODCT(MOLE)	4.0681	4.0144	4.0990
V GAS (MOLES)	3.3283	3.8579	3.3436
V GAS (CC/MOLE)	11.6406	18.9625	11.5702
V SOL C(S) (CC/G)	0.23610	0.36230	0.23447
H2O (MOL %)	33.6520	27.2706	33.2407
CO2 (MOL %)	15.8257	8.5847	15.5213
CO (MOL %)	0.4312	22.2363	0.3953
N2 (MOL %)	31.4602	31.4121	32.0302
H2 (MOL %)	0.0271	4.9314	0.0246
O2 (MOL %)	0.0031	0.0004	0.0030
NH3 (MOL %)	0.0319	1.0283	0.0298
OH (MOL %)	0.0222	0.0918	0.0210
H (MOL %)	0.0002	0.0550	0.0002
CH4 (MOL %)	0.0000	0.1860	0.0000
NO (MOL %)	0.0959	0.0395	0.0951
HCL (MOL %)	0.0053	0.0049	0.0052
CCL4 (MOL %)	0.0000	0.0000	0.0000
CL2 (MOL %)	0.0000	0.0000	0.0000
PCL3 (MOL %)	0.0000	0.0680	0.0000
POCL3 (MOL %)	0.2583	0.1938	0.2051
C(S) (MOL %)	18.1871	3.8972	18.4284

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PBX9404;HMX 94/NC3/CEF3 RHO = 1.8440 G/CC EO = 3.745841E+03 CAL/MOLE

LN P = -3.52783585 E+00 -2.46349049 E+00LN V 3.27751219 E-01LN V*2 -3.13643888 E-02LN V*3 7.54876062 E-04LN V*4

LN T = 7.65015411 E+00 -4.50183630 E-01LN V 1.20597601 E-01LN V*2 -1.85408629 E-02LN V*3 9.14095202 E-04LN V*4

LN E = -1.66271973 E+00 4.62405205 E-01LNP 4.99482560 E-02LN P*2 5.25928289 E-03LN P*3 1.47753759 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (635.463)	0.3405	4105.0 (4021.8)	-1332.4	0.15575 (0.15238)	3.2826	866.1
500.000 (515.771)	0.3631	3809.2 (3828.8)	-1022.1	0.14276 (0.14208)	3.2273	1344.3
400.000 (406.738)	0.3911	3535.7 (3623.3)	-716.6	0.12998 (0.13112)	3.1643	1874.7
* 350.715 (354.806)	0.4084	3396.3 (3511.7)	-560.7	0.12346 (0.12539)	3.1281	2167.0
300.000 (299.504)	0.4313	3318.9 (3379.4)	-428.0	0.11791 (0.11920)	3.0830	2522.6
200.000 (194.758)	0.4973	3103.2 (3071.9)	-128.3	0.10537 (0.10575)	2.9684	3350.5
100.000 (95.642)	0.6370	2717.6 (2642.5)	255.1	0.08933 (0.08922)	2.7786	4514.4
80.000 (76.487)	0.6909	2595.0 (2525.1)	351.2	0.08530 (0.08517)	2.7189	4835.6
60.000 (57.495)	0.7686	2441.4 (2386.0)	460.1	0.08075 (0.08063)	2.6426	5218.8
50.000 (48.060)	0.8230	2348.4 (2304.4)	520.9	0.07820 (0.07810)	2.5948	5445.3
40.000 (38.645)	0.8960	2240.2 (2210.7)	587.8	0.07541 (0.07533)	2.5366	5707.2
30.000 (29.073)	1.0041	2112.4 (2097.1)	662.7	0.07227 (0.07219)	2.4608	6028.3
20.000 (19.717)	1.1798	1949.0 (1956.6)	751.8	0.06854 (0.06846)	2.3577	6432.2
10.000 (10.146)	1.5811	1723.5 (1750.2)	868.3	0.06367 (0.06355)	2.1826	7045.1
8.000 (8.194)	1.7460	1661.7 (1691.9)	900.1	0.06234 (0.06226)	2.1269	7224.4
6.000 (6.185)	1.9975	1593.5 (1620.5)	934.3	0.06091 (0.06077)	2.0540	7448.6
5.000 (5.174)	2.1811	1553.0 (1578.1)	954.9	0.06005 (0.05991)	2.0081	7584.8
4.000 (4.150)	2.4378	1506.9 (1528.8)	978.4	0.05906 (0.05893)	1.9519	7746.6
3.000 (3.115)	2.8319	1452.2 (1469.1)	1006.6	0.05788 (0.05778)	1.8797	7948.2
2.000 (2.068)	3.5429	1383.0 (1392.0)	1042.6	0.05638 (0.05633)	1.7788	8219.6
1.000 (1.019)	5.3816	1280.7 (1278.0)	1096.6	0.05412 (0.05413)	1.6124	8652.1
0.800 (0.812)	6.2100	1250.1 (1245.7)	1113.3	0.05362 (0.05349)	1.5618	8782.8
0.600 (0.604)	7.5374	1214.4 (1206.3)	1132.1	0.05263 (0.05270)	1.4985	8948.6
0.500 (0.501)	8.5531	1191.9 (1182.7)	1144.1	0.05213 (0.05220)	1.4602	9050.7
0.400 (0.398)	10.0288	1164.8 (1155.0)	1158.6	0.05153 (0.05162)	1.4154	9173.4
0.300 (0.297)	12.4036	1130.5 (1121.0)	1176.8	0.05076 (0.05087)	1.3613	9328.4
0.200 (0.196)	16.9572	1083.0 (1075.2)	1201.8	0.04972 (0.04984)	1.2934	9541.1
0.100 (0.097)	29.7603	1002.8 (1000.2)	1242.9	0.04800 (0.04813)	1.2046	9890.1
0.080 (0.078)	35.8581	977.3 (976.2)	1255.4	0.04748 (0.04759)	1.1842	9998.6
0.060 (0.059)	45.6756	944.4 (945.0)	1271.2	0.04681 (0.04690)	1.1641	10135.6
0.050 (0.049)	53.2803	923.5 (925.0)	1280.9	0.04641 (0.04648)	1.1549	10220.9
0.040 (0.039)	64.3607	898.0 (900.3)	1292.5	0.04592 (0.04596)	1.1474	10323.7
0.030 (0.030)	82.1179	865.1 (867.9)	1306.9	0.04532 (0.04531)	1.1437	10453.9
0.020 (0.020)	115.6703	818.6 (821.3)	1326.1	0.04451 (0.04443)	1.1492	10633.1
0.010 (0.010)	206.7283	738.6 (740.1)	1356.3	0.04325 (0.04308)	1.1857	10928.7
0.008 (0.008)	248.6058	712.3 (713.9)	1365.4	0.04287 (0.04270)	1.2039	11020.7
0.006 (0.006)	315.4243	679.6 (680.3)	1376.3	0.04242 (0.04225)	1.2318	11137.9
0.005 (0.005)	366.6743	659.3 (659.1)	1382.8	0.04214 (0.04200)	1.2519	11211.1
0.004 (0.004)	440.2749	634.3 (633.6)	1390.6	0.04182 (0.04174)	1.2788	11299.1
0.003 (0.003)	556.7271	602.5 (601.5)	1400.1	0.04142 (0.04146)	1.3171	11410.0
0.002 (0.002)	773.2515	558.9 (558.1)	1412.6	0.04090 (0.04123)	1.3776	11561.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

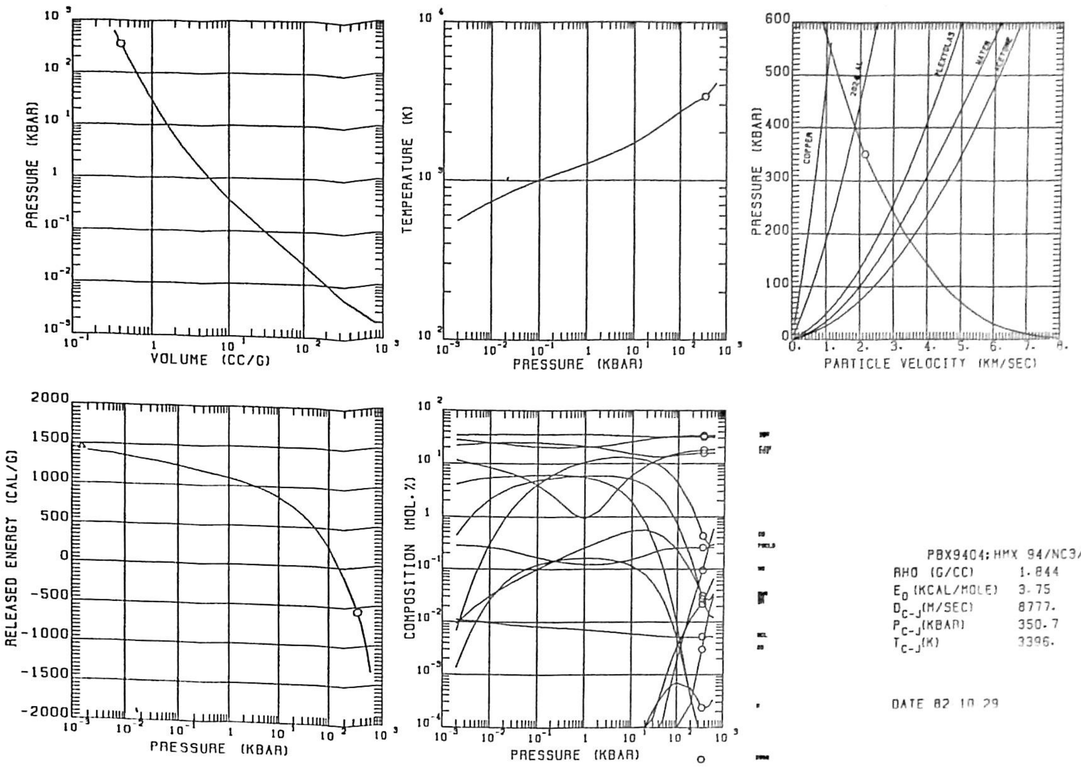
PBX9404;HMX 94/NC3/CEF3 RHO = 1.8440 G/CC EO = 3.745841E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O CL2	CO2 PCL3	CO POCL3	N2 C(S)	H2	O2	NH3	OH	H	CH4	NO	HCL	CCL4
350.715	1.36901	0.64380	0.01759	1.27985	0.00110	0.00012	0.00130	0.00090	0.00001	0.00000	0.00390	0.00021	0.00000
	0.00000	0.00000	0.01051	0.73984									
300.000	1.36761	0.64113	0.02591	1.28030	0.00187	0.00007	0.00176	0.00079	0.00001	0.00000	0.00254	0.00021	0.00000
	0.00000	0.00000	0.01051	0.73419									
200.000	1.36058	0.62749	0.06243	1.28026	0.00622	0.00001	0.00362	0.00049	0.00002	0.00001	0.00075	0.00021	0.00000
	0.00000	0.00002	0.01049	0.71130									
100.000	1.32910	0.58597	0.17817	1.27778	0.02872	0.00000	0.00925	0.00014	0.00003	0.00037	0.00008	0.00021	0.00000
	0.00000	0.00020	0.01031	0.63672									
80.000	1.31202	0.57164	0.22418	1.27667	0.04147	0.00000	0.01152	0.00008	0.00003	0.00085	0.00003	0.00021	0.00000
	0.00000	0.00037	0.01014	0.60456									
60.000	1.28433	0.55571	0.28415	1.27518	0.06195	0.00000	0.01453	0.00004	0.00002	0.00220	0.00001	0.00022	0.00000
	0.00000	0.00071	0.00980	0.55917									
50.000	1.26358	0.54810	0.32044	1.27427	0.07683	0.00000	0.01635	0.00003	0.00002	0.00378	0.00001	0.00022	0.00000
	0.00000	0.00101	0.00950	0.52891									
40.000	1.23487	0.54208	0.36164	1.27327	0.09637	0.00000	0.01836	0.00001	0.00001	0.00686	0.00000	0.00022	0.00000
	0.00000	0.00145	0.00906	0.49065									
30.000	1.19434	0.54043	0.40614	1.27234	0.12177	0.00000	0.02022	0.00001	0.00001	0.01304	0.00000	0.00022	0.00000
	0.00000	0.00210	0.00841	0.44162									
20.000	1.12604	0.54955	0.45721	1.27152	0.15605	0.00000	0.02185	0.00000	0.00000	0.02882	0.00000	0.00023	0.00000
	0.00000	0.00309	0.00742	0.36566									
10.000	0.99873	0.59133	0.50241	1.27203	0.19679	0.00000	0.02084	0.00000	0.00000	0.07287	0.00000	0.00023	0.00000
	0.00000	0.00453	0.00598	0.23464									
8.000	0.96036	0.61009	0.50358	1.27256	0.20363	0.00000	0.01978	0.00000	0.00000	0.08943	0.00000	0.00023	0.00000
	0.00000	0.00485	0.00566	0.19813									
6.000	0.91136	0.63350	0.50614	1.27332	0.21135	0.00000	0.01825	0.00000	0.00000	0.11121	0.00000	0.00024	0.00000
	0.00000	0.00524	0.00527	0.15038									
5.000	0.88391	0.64925	0.50228	1.27385	0.21414	0.00000	0.01720	0.00000	0.00000	0.12433	0.00000	0.00024	0.00000
	0.00000	0.00542	0.00509	0.12537									
4.000	0.85358	0.66851	0.49429	1.27450	0.21630	0.00000	0.01591	0.00000	0.00000	0.13938	0.00000	0.00024	0.00000
	0.00000	0.00560	0.00490	0.09908									
3.000	0.81997	0.69295	0.47919	1.27530	0.21750	0.00000	0.01430	0.00000	0.00000	0.15679	0.00000	0.00025	0.00000
	0.00000	0.00578	0.00473	0.07232									
2.000	0.78268	0.72593	0.45066	1.27634	0.21715	0.00000	0.01222	0.00000	0.00000	0.17716	0.00000	0.00025	0.00000
	0.00000	0.00592	0.00459	0.04749									
1.000	0.74183	0.77702	0.38938	1.27780	0.21337	0.00000	0.00931	0.00000	0.00000	0.20167	0.00000	0.00026	0.00000
	0.00000	0.00595	0.00455	0.03317									
0.800	0.73462	0.79267	0.36525	1.27819	0.21081	0.00000	0.00852	0.00000	0.00000	0.20714	0.00000	0.00027	0.00000
	0.00000	0.00590	0.00461	0.03619									
0.600	0.72679	0.81009	0.33817	1.27864	0.20881	0.00000	0.00762	0.00000	0.00000	0.21274	0.00000	0.00027	0.00000
	0.00000	0.00584	0.00467	0.04025									
0.500	0.72415	0.82093	0.31906	1.27891	0.20684	0.00000	0.00709	0.00000	0.00000	0.21544	0.00000	0.00027	0.00000
	0.00000	0.00577	0.00474	0.04582									
0.400	0.72286	0.83356	0.29498	1.27921	0.20405	0.00000	0.00648	0.00000	0.00000	0.21793	0.00000	0.00028	0.00000
	0.00000	0.00566	0.00485	0.05475									
0.300	0.72409	0.84865	0.26340	1.27957	0.19988	0.00000	0.00577	0.00000	0.00000	0.21993	0.00000	0.00028	0.00000
	0.00000	0.00548	0.00503	0.06926									
0.200	0.73096	0.86742	0.21867	1.28001	0.19268	0.00000	0.00489	0.00000	0.00000	0.22076	0.00000	0.00029	0.00000
	0.00000	0.00515	0.00536	0.09438									
0.100	0.75431	0.89177	0.14588	1.28064	0.17584	0.00000	0.00362	0.00000	0.00000	0.21845	0.00000	0.00030	0.00000
	0.00000	0.00439	0.00612	0.14513									
0.080	0.76410	0.89716	0.12502	1.28082	0.16928	0.00000	0.00328	0.00000	0.00000	0.21709	0.00000	0.00030	0.00000
	0.00000	0.00410	0.00641	0.16196									
0.060	0.77829	0.90236	0.10002	1.28102	0.15958	0.00000	0.00288	0.00000	0.00000	0.21515	0.00000	0.00031	0.00000
	0.00000	0.00369	0.00682	0.18371									
0.050	0.78808	0.90456	0.08556	1.28114	0.15277	0.00000	0.00264	0.00000	0.00000	0.21384	0.00000	0.00031	0.00000
	0.00000	0.00341	0.00710	0.19731									
0.040	0.80083	0.90600	0.06959	1.28127	0.14385	0.00000	0.00238	0.00000	0.00000	0.21212	0.00000	0.00032	0.00000
	0.00000	0.00306	0.00745	0.21357									
0.030	0.81840	0.90589	0.05176	1.28143	0.13138	0.00000	0.00206	0.00000	0.00000	0.20980	0.00000	0.00032	0.00000
	0.00000	0.00260	0.00792	0.23382									
0.020	0.84553	0.90190	0.03197	1.28162	0.11225	0.00000	0.00168	0.00000	0.00000	0.20609	0.00000	0.00033	0.00000
	0.00000	0.00194	0.00857	0.26129									
0.010	0.89811	0.88546	0.01132	1.28189	0.07750	0.00000	0.00114	0.00000	0.00000	0.19758	0.00000	0.00035	0.00000
	0.00000	0.00096	0.00955	0.30690									
0.008	0.91719	0.87772	0.00748	1.28197	0.06619	0.00000	0.00099	0.00000	0.00000	0.19380	0.00000	0.00036	0.00000
	0.00000	0.00071	0.00980	0.32225									
0.006	0.94197	0.86683	0.00425	1.28205	0.05314	0.00000	0.00082	0.00000	0.00000	0.18806	0.00000	0.00038	0.00000
	0.00000	0.00047	0.01004	0.34212									
0.005	0.95807	0.85940	0.00289	1.28210	0.04563	0.00000	0.00072	0.00000	0.00000	0.18383	0.00000	0.00039	0.00000
	0.00000	0.00035	0.01016	0.35514									
0.004	0.97872	0.84961	0.00172	1.28216	0.03702	0.00000	0.00062	0.00000	0.00000	0.17789	0.00000	0.00039	0.00000
	0.00000	0.00023	0.01028	0.37204									
0.003	1.00624	0.83625	0.00083	1.28222	0.02740	0.00000	0.00049	0.00000	0.00000	0.16904	0.00000	0.00040	0.00000
	0.00000	0.00013	0.01038	0.39514									
0.002	1.04682	0.81621	0.00026	1.28229	0.01678	0.00000	0.00035	0.00000	0.00000	0.15416	0.00000	0.00042	0.00000
	0.00000	0.00005	0.01046	0.43063									
400.000	1.36937	0.64361	0.01453	1.27866	0.00082	0.00025	0.00115	0.00119	0.00001	0.00000	0.00643	0.00021	0.00000
	0.00000	0.00000	0.01051	0.74309									
500.000	1.36945	0.64048	0.01140	1.27486	0.00054	0.00071	0.00105	0.00188	0.00001	0.00000	0.01413	0.00022	0.00000
	0.00000	0.00000	0.01051	0.74935									
600.000	1.36861	0.63495	0.01187	1.26992	0.00050	0.00124	0.00137	0.00269	0.00001	0.00000	0.02368	0.00022	0.00000
	0.00000	0.00000	0.01051	0.75441									

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

PBX9408;HMX 94/DNPA/CEF RHO = 1.8420 G/CC EO = 4.256953E+03 CAL/MOLE

LN P = -3.53005314 E+00 -2.46512699 E+00LN V 3.28528702 E-01LN V*2 -3.15367617 E-02LN V*3 7.62985554 E-04LN V*4

LN T = 7.64629459 E+00 -4.48232710 E-01LN V 1.19714916 E-01LN V*2 -1.84521005 E-02LN V*3 9.08913091 E-04LN V*4

LN E = -1.663B2122 E+00 4.59927559 E-01LNP 6.96820617 E-02LN P*2 5.24429604 E-03LN P*3 1.47500541 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (636.045)	0.3405	4078.1 (3993.6)	-1333.7	0.15580 (0.15240)	3.2866	918.9
500.000 (515.931)	0.3631	3782.8 (3802.6)	-1023.7	0.14283 (0.14215)	3.2311	1397.3
400.000 (406.754)	0.3911	3510.1 (3599.6)	-718.8	0.13007 (0.13125)	3.1679	1927.6
* 354.559 (358.834)	0.4070	3381.8 (3498.3)	-575.3	0.12407 (0.12600)	3.1345	2195.7
300.000 (299.272)	0.4314	3299.6 (3358.1)	-432.8	0.11811 (0.11939)	3.0862	2577.1
200.000 (194.595)	0.4973	3086.1 (3054.4)	-133.9	0.10560 (0.10599)	2.9713	3404.4
100.000 (95.587)	0.6368	2704.9 (2629.9)	248.1	0.08962 (0.08952)	2.7812	4566.8
80.000 (76.453)	0.6907	2583.6 (2513.8)	343.9	0.08561 (0.08548)	2.7214	4887.5
60.000 (57.479)	0.7681	2431.6 (2376.1)	452.3	0.08107 (0.08096)	2.6451	5270.2
50.000 (48.052)	0.8225	2339.5 (2295.3)	512.9	0.07854 (0.07844)	2.5972	5496.3
40.000 (38.644)	0.8953	2232.3 (2202.5)	579.6	0.07575 (0.07567)	2.5390	5757.8
30.000 (29.069)	1.0033	2105.5 (2089.8)	654.2	0.07263 (0.07254)	2.4630	6078.7
20.000 (19.719)	1.1785	1943.2 (1950.5)	743.0	0.06891 (0.06883)	2.3598	6482.0
10.000 (10.149)	1.5789	1719.0 (1745.6)	859.1	0.06405 (0.06393)	2.1845	7094.2
8.000 (8.197)	1.7433	1657.4 (1687.6)	890.8	0.06273 (0.06265)	2.1286	7273.2
6.000 (6.188)	1.9941	1589.5 (1616.6)	924.9	0.06130 (0.06117)	2.0557	7497.1
5.000 (5.176)	2.1772	1549.1 (1574.4)	945.4	0.06044 (0.06031)	2.0097	7633.2
4.000 (4.152)	2.4333	1503.2 (1525.3)	968.9	0.05946 (0.05933)	1.9535	7794.9
3.000 (3.116)	2.8267	1448.8 (1465.8)	996.9	0.05829 (0.05818)	1.8811	7996.3
2.000 (2.068)	3.5360	1379.7 (1388.9)	1032.9	0.05678 (0.05672)	1.7800	8267.6
1.000 (1.019)	5.3692	1277.4 (1275.1)	1086.8	0.05453 (0.05455)	1.6136	8699.3
0.800 (0.811)	6.2019	1247.9 (1242.6)	1102.4	0.05387 (0.05391)	1.5626	8830.9
0.600 (0.604)	7.5192	1211.1 (1203.3)	1122.0	0.05305 (0.05312)	1.4996	8995.5
0.500 (0.501)	8.5307	1188.5 (1179.7)	1134.1	0.05255 (0.05263)	1.4613	9097.4
0.400 (0.398)	10.0014	1161.4 (1151.9)	1148.5	0.05194 (0.05204)	1.4165	9219.9
0.300 (0.297)	12.3678	1127.1 (1117.7)	1166.7	0.05118 (0.05130)	1.3625	9374.6
0.200 (0.196)	16.9038	1079.4 (1071.7)	1191.6	0.05014 (0.05028)	1.2947	9587.0
0.100 (0.097)	29.6502	998.8 (996.1)	1232.6	0.04843 (0.04857)	1.2061	9935.2
0.080 (0.078)	35.7172	973.2 (971.8)	1245.0	0.04791 (0.04803)	1.1858	10043.4
0.060 (0.059)	45.4819	940.1 (940.4)	1260.7	0.04725 (0.04734)	1.1658	10180.1
0.050 (0.049)	53.0433	919.1 (920.3)	1270.4	0.04685 (0.04692)	1.1567	10265.1
0.040 (0.039)	64.0563	893.4 (895.4)	1281.9	0.04636 (0.04640)	1.1493	10367.6
0.030 (0.030)	81.6962	860.2 (862.8)	1296.2	0.04577 (0.04575)	1.1457	10497.3
0.020 (0.020)	115.0031	813.3 (815.9)	1315.3	0.04497 (0.04488)	1.1515	10675.9
0.010 (0.010)	205.0643	732.0 (734.4)	1345.5	0.04370 (0.04354)	1.1881	10969.7
0.008 (0.008)	246.8073	706.4 (708.0)	1354.3	0.04334 (0.04316)	1.2064	11061.8
0.006 (0.006)	312.9661	673.5 (674.2)	1365.0	0.04289 (0.04272)	1.2344	11178.5
0.005 (0.005)	363.6780	653.1 (652.9)	1371.5	0.04262 (0.04247)	1.2545	11251.3
0.004 (0.004)	436.5110	628.0 (627.4)	1379.2	0.04229 (0.04221)	1.2815	11338.8
0.003 (0.003)	551.6890	596.2 (595.2)	1388.6	0.04190 (0.04195)	1.3199	11449.1
0.002 (0.002)	765.7234	552.6 (551.6)	1401.0	0.04138 (0.04172)	1.3803	11599.4

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

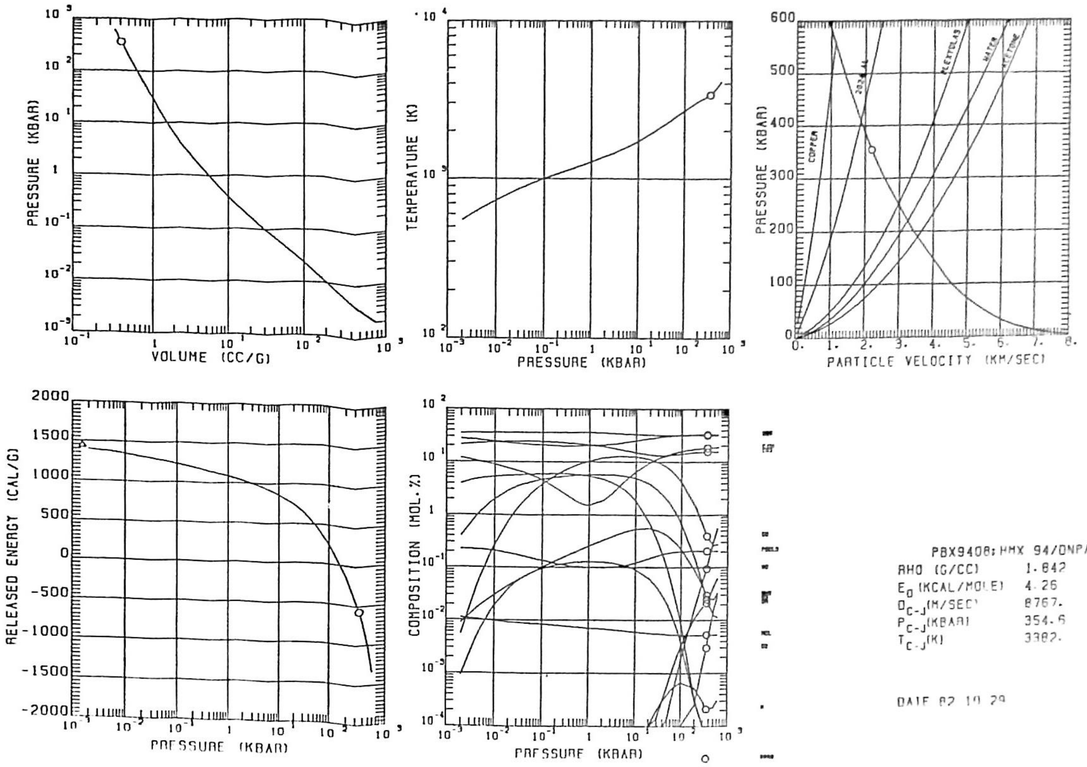
PBX9408;HMX 94/DNPA/CEF RHO = 1.8420 G/CC EO = 4.256953E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O CL2	CO2 PCL3	CO POCL3	N2 C(S)	H2	O2	NH3	OH	H	CH4	NO	HCL	CCL4
354.559	1.36252	0.63619	0.01630	1.31293	0.00102	0.00012	0.00123	0.00086	0.00001	0.00000	0.00389	0.00021	0.00000
	0.00000	0.00000	0.00841	0.75532									
300.000	1.36109	0.63351	0.02476	1.31341	0.00179	0.00006	0.00171	0.00075	0.00001	0.00000	0.00245	0.00021	0.00000
	0.00000	0.00000	0.00841	0.74953									
200.000	1.35423	0.62039	0.05998	1.31335	0.00601	0.00001	0.00354	0.00046	0.00002	0.00001	0.00072	0.00021	0.00000
	0.00000	0.00001	0.00839	0.72743									
100.000	1.32331	0.58008	0.17267	1.31088	0.02801	0.00000	0.00914	0.00013	0.00003	0.00035	0.00007	0.00021	0.00000
	0.00000	0.00016	0.00825	0.65471									
80.000	1.30645	0.56608	0.21775	1.30976	0.04055	0.00000	0.01142	0.00008	0.00002	0.00081	0.00003	0.00021	0.00000
	0.00000	0.00029	0.00812	0.62316									
60.000	1.27908	0.55047	0.27667	1.30825	0.06077	0.00000	0.01445	0.00004	0.00002	0.00213	0.00001	0.00022	0.00000
	0.00000	0.00056	0.00785	0.57853									
50.000	1.25853	0.54301	0.31240	1.30733	0.07548	0.00000	0.01629	0.00002	0.00002	0.00367	0.00001	0.00022	0.00000
	0.00000	0.00079	0.00762	0.54872									
40.000	1.23007	0.53709	0.35307	1.30632	0.09486	0.00000	0.01833	0.00001	0.00001	0.00669	0.00000	0.00022	0.00000
	0.00000	0.00114	0.00727	0.51095									
30.000	1.18983	0.53551	0.39701	1.30537	0.12007	0.00000	0.02023	0.00001	0.00001	0.01278	0.00000	0.00022	0.00000
	0.00000	0.00166	0.00675	0.46251									
20.000	1.12193	0.54456	0.44760	1.30452	0.15420	0.00000	0.02192	0.00000	0.00000	0.02840	0.00000	0.00022	0.00000
	0.00000	0.00245	0.00596	0.38725									
10.000	0.99513	0.58608	0.49252	1.30501	0.19482	0.00000	0.02095	0.00000	0.00000	0.07221	0.00000	0.00023	0.00000
	0.00000	0.00360	0.00481	0.25699									
8.000	0.95692	0.60475	0.49365	1.30554	0.20161	0.00000	0.01989	0.00000	0.00000	0.08871	0.00000	0.00024	0.00000
	0.00000	0.00386	0.00455	0.22069									
6.000	0.90811	0.62806	0.49616	1.30630	0.20928	0.00000	0.01837	0.00000	0.00000	0.11043	0.00000	0.00024	0.00000
	0.00000	0.00417	0.00424	0.17315									
5.000	0.88073	0.64375	0.49231	1.30683	0.21205	0.00000	0.01731	0.00000	0.00000	0.12353	0.00000	0.00024	0.00000
	0.00000	0.00431	0.00409	0.14822									
4.000	0.85045	0.66290	0.48443	1.30748	0.21419	0.00000	0.01601	0.00000	0.00000	0.13857	0.00000	0.00024	0.00000
	0.00000	0.00446	0.00394	0.12193									
3.000	0.81682	0.68714	0.46974	1.30829	0.21543	0.00000	0.01439	0.00000	0.00000	0.15598	0.00000	0.00025	0.00000
	0.00000	0.00460	0.00380	0.09499									
2.000	0.77965	0.71995	0.44141	1.30934	0.21499	0.00000	0.01230	0.00000	0.00000	0.17635	0.00000	0.00025	0.00000
	0.00000	0.00472	0.00369	0.07011									
1.000	0.73908	0.77078	0.38034	1.31080	0.21095	0.00000	0.00937	0.00000	0.00000	0.20086	0.00000	0.00026	0.00000
	0.00000	0.00474	0.00367	0.05583									
0.800	0.73096	0.78546	0.35908	1.31120	0.20921	0.00000	0.00858	0.00000	0.00000	0.20638	0.00000	0.00026	0.00000
	0.00000	0.00471	0.00370	0.05692									
0.600	0.72406	0.80352	0.32979	1.31166	0.20629	0.00000	0.00766	0.00000	0.00000	0.21198	0.00000	0.00027	0.00000
	0.00000	0.00464	0.00377	0.06253									
0.500	0.72156	0.81436	0.31055	1.31192	0.20413	0.00000	0.00713	0.00000	0.00000	0.21470	0.00000	0.00027	0.00000
	0.00000	0.00458	0.00383	0.06821									
0.400	0.72035	0.82685	0.28670	1.31223	0.20123	0.00000	0.00652	0.00000	0.00000	0.21721	0.00000	0.00028	0.00000
	0.00000	0.00449	0.00392	0.07706									
0.300	0.72165	0.84175	0.25546	1.31259	0.19692	0.00000	0.00581	0.00000	0.00000	0.21925	0.00000	0.00028	0.00000
	0.00000	0.00434	0.00406	0.09137									
0.200	0.72864	0.86022	0.21127	1.31304	0.18950	0.00000	0.00491	0.00000	0.00000	0.22014	0.00000	0.00029	0.00000
	0.00000	0.00408	0.00433	0.11617									
0.100	0.75222	0.88392	0.13969	1.31367	0.17221	0.00000	0.00364	0.00000	0.00000	0.21795	0.00000	0.00030	0.00000
	0.00000	0.00346	0.00495	0.16628									
0.080	0.76209	0.88908	0.11926	1.31385	0.16549	0.00000	0.00329	0.00000	0.00000	0.21663	0.00000	0.00031	0.00000
	0.00000	0.00322	0.00519	0.18286									
0.060	0.77644	0.89394	0.09486	1.31405	0.15558	0.00000	0.00289	0.00000	0.00000	0.21471	0.00000	0.00031	0.00000
	0.00000	0.00289	0.00552	0.20433									
0.050	0.78635	0.89590	0.08082	1.31417	0.14865	0.00000	0.00265	0.00000	0.00000	0.21340	0.00000	0.00032	0.00000
	0.00000	0.00266	0.00575	0.21772									
0.040	0.79920	0.89706	0.06536	1.31430	0.13960	0.00000	0.00238	0.00000	0.00000	0.21170	0.00000	0.00033	0.00000
	0.00000	0.00238	0.00603	0.23373									
0.030	0.81700	0.89655	0.04821	1.31446	0.12698	0.00000	0.00207	0.00000	0.00000	0.20935	0.00000	0.00033	0.00000
	0.00000	0.00200	0.00641	0.25376									
0.020	0.84436	0.89204	0.02936	1.31466	0.10775	0.00000	0.00168	0.00000	0.00000	0.20558	0.00000	0.00034	0.00000
	0.00000	0.00148	0.00693	0.28087									
0.010	0.89812	0.87450	0.00992	1.31494	0.07270	0.00000	0.00113	0.00000	0.00000	0.19663	0.00000	0.00036	0.00000
	0.00000	0.00070	0.00770	0.32677									
0.008	0.91655	0.86686	0.00660	1.31501	0.06227	0.00000	0.00098	0.00000	0.00000	0.19274	0.00000	0.00036	0.00000
	0.00000	0.00052	0.00789	0.34163									
0.006	0.94154	0.85574	0.00368	1.31510	0.04958	0.00000	0.00081	0.00000	0.00000	0.18671	0.00000	0.00037	0.00000
	0.00000	0.00034	0.00807	0.36169									
0.005	0.95776	0.84819	0.00247	1.31514	0.04232	0.00000	0.00071	0.00000	0.00000	0.18230	0.00000	0.00038	0.00000
	0.00000	0.00025	0.00816	0.37486									
0.004	0.97849	0.83830	0.00145	1.31520	0.03410	0.00000	0.00061	0.00000	0.00000	0.17613	0.00000	0.00039	0.00000
	0.00000	0.00016	0.00824	0.39195									
0.003	1.00616	0.82482	0.00069	1.31526	0.02499	0.00000	0.00048	0.00000	0.00000	0.16694	0.00000	0.00040	0.00000
	0.00000	0.00009	0.00832	0.41539									
0.002	1.04692	0.80466	0.00021	1.31534	0.01508	0.00000	0.00034	0.00000	0.00000	0.15162	0.00000	0.00042	0.00000
	0.00000	0.00003	0.00838	0.45135									
400.000	1.36283	0.63595	0.01370	1.31185	0.00077	0.00023	0.00110	0.00112	0.00001	0.00000	0.00618	0.00022	0.00000
	0.00000	0.00000	0.00841	0.75816									
500.000	1.36290	0.63286	0.01077	1.30813	0.00051	0.00067	0.00101	0.00177	0.00001	0.00000	0.01369	0.00022	0.00000
	0.00000	0.00000	0.00841	0.76418									
600.000	1.36209	0.62743	0.01127	1.30329	0.00047	0.00118	0.00132	0.00255	0.00001	0.00000	0.02307	0.00022	0.00000
	0.00000	0.00000	0.00841	0.76911									

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES		NM/CHBR3 1/0.02 278 K	#NM/CHBR3 1/0.02 288 K	#NM/CHBR3 1/0.02 298 K	#NM/CHBR3 1/0.02 313 K	#NM/CHBR3 1/0.05/278 K	#NM/CHBR3 1/0.05/288 K	#NM/CHBR3 1/0.05/298 K	#
RHO	(G/CC)	1.206	1.192	1.178	1.157	1.280	1.265	1.250	
EO	(KCAL/MOLE)	-27.65	-27.39	-27.13	-26.74	-27.81	-27.54	-27.27	
MOL.WEIGHT	(G)	66.095	66.095	66.095	66.095	73.678	73.678	73.678	
C		1.0200	1.0200	1.0200	1.0200	1.0500	1.0500	1.0500	
H		3.0200	3.0200	3.0200	3.0200	3.0500	3.0500	3.0500	
N		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
O		2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	
BR		0.0600	0.0600	0.0600	0.0600	0.1500	0.1500	0.1500	
DETN.VEL	(M/SEC)	6195.2	6156.4	6119.2	6061.6	5991.2	5954.7	5918.9	
PARTICL.VEL	(")	1628.1	1641.5	1661.9	1629.0	1615.2	1610.2	1564.8	
C-J PRESS	(KBAR)	121.6	120.5	119.8	114.2	123.9	121.3	115.8	
C-J VOLUME	(CC/G)	0.61128	0.61525	0.61836	0.63203	0.57063	0.57676	0.58850	
C-J TEMP	(DEG K)	3194.9	3215.5	3239.7	3241.6	3145.0	3157.1	3147.2	
C-J S	(CAL/DEG MOL)	54.23	54.26	54.29	54.21	54.44	54.44	54.34	
C-J ENERGY	(CAL/G)	316.75	321.99	330.04	317.12	311.78	309.82	292.60	
GAMMA		2.805	2.751	2.682	2.721	2.709	2.698	2.783	
C-J DETN.HEAT	(CAL)	1195.5	1196.3	1197.2	1196.0	1076.4	1077.1	1076.7	
LAMDA		8.0605	8.0600	8.0594	8.0592	8.4322	8.4333	8.4363	
VOLUM	(K LITTRE/KG)	0.8851	0.8873	0.8895	0.8945	0.8111	0.8136	0.8172	
TOTAL PRODCT	(MOLE)	3.0424	3.0414	3.0404	3.0380	3.1334	3.1322	3.1305	
V GAS	(MOLES)	2.3913	2.3972	2.4030	2.4167	2.4426	2.4501	2.4611	
V GAS	(CC/MOLE)	15.7758	15.8552	15.9125	16.2135	16.0541	16.1988	16.4885	
V SOL C(S)	(CC/G)	0.34257	0.34340	0.34394	0.34732	0.34095	0.34255	0.34582	
H2O	(MOL %)	46.2629	46.0976	45.9397	45.5352	45.0802	44.8573	44.5102	
CO2	(MOL %)	7.3382	7.3160	7.2720	7.2003	7.2918	7.2643	7.2438	
CO	(MOL %)	4.7339	5.0042	5.2686	5.8689	4.1444	4.4450	4.8687	
N2	(MOL %)	16.1685	16.1606	16.1530	16.1391	15.7122	15.7039	15.6948	
H2	(MOL %)	1.8219	1.9410	2.0560	2.3502	1.5687	1.7000	1.8989	
O2	(MOL %)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	
NH3	(MOL %)	0.5268	0.5524	0.5775	0.6318	0.4856	0.5130	0.5493	
OH	(MOL %)	0.0191	0.0203	0.0218	0.0220	0.0157	0.0163	0.0159	
H	(MOL %)	0.0049	0.0055	0.0061	0.0068	0.0038	0.0041	0.0045	
CH4	(MOL %)	0.0342	0.0384	0.0426	0.0556	0.0292	0.0340	0.0426	
NO	(MOL %)	0.0066	0.0069	0.0073	0.0069	0.0056	0.0056	0.0052	
HBR	(MOL %)	1.3535	1.3835	1.4073	1.4909	2.4487	2.5654	2.7703	
BR2	(MOL %)	0.3093	0.2947	0.2831	0.2420	1.1693	1.1118	1.0106	
C(S)	(MOL %)	21.4002	21.1789	20.9652	20.4503	22.0450	21.7793	21.3854	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	NM/CHBR3 1/0.05,313 K	#NM/CHBR3 1/0.1 ,278 K	#NM/CHBR3 1/0.1 ,288 K	#NM/CHBR3 1/0.1 ,298 K	#NM/CHBR3 1/0.1 ,313 K	#NM/CHBR3 1/0.15,278 K	#NM/CHBR3 # 1/0.15,288 K
RHO (G/CC)	1.227	1.393	1.379	1.365	1.344	1.494	1.478
EO (KCAL/MOLE)	-26.87	-28.08	-27.79	-27.51	-27.09	-28.34	-28.05
MOL.WEIGHT (G)	73.678	86.315	86.315	86.315	86.315	98.952	98.952
C	1.0500	1.1000	1.1000	1.1000	1.1000	1.1500	1.1500
H	3.0500	3.1000	3.1000	3.1000	3.1000	3.1500	3.1500
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
BR	0.1500	0.3000	0.3000	0.3000	0.3000	0.4500	0.4500
DETN.VEL (M/SEC)	5864.5	5707.8	5679.5	5652.0	5609.9	5479.5	5451.4
PARTICL.VEL(")	1599.9	1539.4	1534.4	1546.3	1517.6	1483.2	1487.0
C-J PRESS (KBAR)	115.2	122.4	120.2	119.3	114.4	121.4	119.8
C-J VOLUME (CC/G)	0.59241	0.52427	0.52925	0.53217	0.54276	0.48817	0.49204
C-J TEMP (DEG K)	3186.8	3030.0	3042.2	3063.6	3068.6	2923.4	2942.1
C-J S(CAL/DEG MOL)	54.40	54.60	54.61	54.65	54.59	54.71	54.75
C-J ENERGY (CAL/G)	305.89	283.18	281.35	285.73	275.24	262.87	264.23
GAMMA	2.665	2.708	2.701	2.655	2.696	2.695	2.666
C-J DETN.HEAT(CAL)	1078.1	921.3	922.8	924.2	925.7	804.8	806.4
LAMDA	8.4353	9.0006	9.0028	9.0033	9.0081	9.5208	9.5231
VOLUM(K LITTRE/KG)	0.8202	0.7167	0.7186	0.7202	0.7239	0.6459	0.6476
TOTAL PRODCT(MOLE)	3.1291	3.2840	3.2831	3.2823	3.2805	3.4347	3.4339
V GAS (MOLES)	2.4700	2.5287	2.5354	2.5411	2.5542	2.6126	2.6191
V GAS (CC/MOLE)	16.5607	16.6719	16.8044	16.8744	17.1597	17.2005	17.3112
V SOL C(S) (CC/G)	0.34642	0.34115	0.34254	0.34319	0.34617	0.34111	0.34217
H2O (MOL %)	44.2634	43.3477	43.1342	42.9681	42.5494	41.9107	41.7026
CO2 (MOL %)	7.1858	7.0713	7.0675	7.0513	7.0535	6.7867	6.7941
CO (MOL %)	5.2582	3.3970	3.6344	3.8475	4.2940	2.7362	2.9432
N2 (MOL %)	15.6842	15.0023	14.9961	14.9899	14.9797	14.3537	14.3478
H2 (MOL %)	2.0618	1.3036	1.4022	1.4876	1.6800	1.0790	1.1616
O2 (MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.5846	0.4425	0.4639	0.4834	0.5200	0.4046	0.4241
OH (MOL %)	0.0179	0.0101	0.0106	0.0113	0.0116	0.0065	0.0070
H (MOL %)	0.0053	0.0023	0.0025	0.0028	0.0032	0.0014	0.0016
CH4 (MOL %)	0.0490	0.0257	0.0294	0.0326	0.0411	0.0223	0.0254
NO (MOL %)	0.0057	0.0036	0.0036	0.0038	0.0037	0.0023	0.0024
HBR (MOL %)	2.8489	3.6502	3.8271	3.9400	4.2981	4.4195	4.6219
BR2 (MOL %)	0.9724	2.7425	2.6553	2.6000	2.4234	4.3410	4.2415
C(S) (MOL %)	21.0629	23.0013	22.7734	22.5818	22.1424	23.9362	23.7270

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	NM/CHBR3 1/0.15,298 K	#NM/CHBR3 1/0.15,313 K	#NM/CHBR3 1/0.2 ,278 K	#NM/CHBR3 1/0.2 ,288 K	#NM/CHBR3 1/0.2 ,298 K	#NM/CHBR3 1/0.2 ,313 K	#NM/CHBR3 # 1/0.3 ,278 K
RHO (G/CC)	1.462	1.438	1.582	1.565	1.548	1.523	1.736
EO (KCAL/MOLE)	-27.75	-27.30	-28.61	-28.30	-27.99	-27.52	-29.18
MOL.WEIGHT (G)	98.952	98.952	111.590	111.590	111.590	111.590	136.864
C	1.1500	1.1500	1.2000	1.2000	1.2000	1.2000	1.3000
H	3.1500	3.1500	3.2000	3.2000	3.2000	3.2000	3.3000
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
BR	0.4500	0.4500	0.6000	0.6000	0.6000	0.6000	0.9000
DETN.VEL (M/SEC)	5422.8	5380.8	5286.4	5259.0	5232.0	5191.8	4985.0
PARTICL.VEL(")	1463.4	1467.7	1434.5	1430.5	1425.0	1413.7	1332.4
C-J PRESS (KBAR)	116.0	113.6	120.0	117.7	115.4	111.7	115.3
C-J VOLUME (CC/G)	0.49941	0.50572	0.46058	0.46517	0.47005	0.47797	0.42207
C-J TEMP (DEG K)	2944.9	2971.4	2822.0	2837.3	2851.5	2870.4	2614.3
C-J S(CAL/DEG MOL)	54.71	54.74	54.76	54.79	54.81	54.82	54.66
C-J ENERGY (CAL/G)	255.93	257.45	245.92	244.53	242.68	238.83	212.15
GAMMA	2.706	2.666	2.685	2.676	2.671	2.673	2.741
C-J DETN.HEAT(CAL)	807.9	810.0	713.7	715.5	717.3	719.7	580.5
LAMDA	9.5286	9.5315	10.0028	10.0068	10.0109	10.0170	10.8716
VOLUM(K LITTRE/KG)	0.6499	0.6526	0.5914	0.5930	0.5947	0.5975	0.5127
TOTAL PRODCT(MOLE)	3.4328	3.4313	3.5853	3.5844	3.5835	3.5820	3.8865
V GAS (MOLES)	2.6285	2.6396	2.6973	2.7047	2.7125	2.7254	2.8684
V GAS (CC/MOLE)	17.5349	17.7116	17.7048	17.8530	18.0094	18.2617	18.6771
V SOL C(S) (CC/G)	0.34446	0.34611	0.34137	0.34279	0.34427	0.34661	0.34294
H2O (MOL %)	41.3838	41.0396	40.6184	40.3715	40.1083	39.6813	38.3759
CO2 (MOL %)	6.8275	6.8331	6.4754	6.5087	6.5420	6.5926	5.8436
CO (MOL %)	3.2142	3.5712	2.2084	2.4027	2.6133	2.9617	1.3953
N2 (MOL %)	14.3412	14.3319	13.7583	13.7526	13.7467	13.7379	12.7059
H2 (MOL %)	1.2745	1.4179	0.9048	0.9829	1.0675	1.2072	0.6339
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.4467	0.4774	0.3738	0.3922	0.4112	0.4404	0.3177
OH (MOL %)	0.0071	0.0078	0.0042	0.0045	0.0047	0.0051	0.0016
H (MOL %)	0.0017	0.0020	0.0009	0.0010	0.0011	0.0013	0.0003
CH4 (MOL %)	0.0303	0.0364	0.0198	0.0228	0.0264	0.0328	0.0155
NO (MOL %)	0.0023	0.0025	0.0015	0.0015	0.0016	0.0016	0.0005
HBR (MOL %)	4.9755	5.2977	5.0014	5.2925	5.6011	6.0987	5.8731
BR2 (MOL %)	4.0668	3.9084	5.8668	5.7233	5.5711	5.3258	8.6421
C(S) (MOL %)	23.4286	23.0739	24.7665	24.5439	24.3050	23.9134	26.1947

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	NM/CHBR3 1/0.3 ,288 K	#NM/CHBR3 1/0.3 ,298 K	#NM/CHBR3 1/0.3 ,313 K	#NM/CHBR3 1/0.35,278 K	#NM/CHBR3 1/0.35,288 K	#NM/CHBR3 1/0.35,298 K	#NM/CHBR3 # 1/0.35,313 K
RHO (G/CC)	1.718	1.700	1.673	1.789	1.775	1.761	1.740
EO (KCAL/MOLE)	-28.82	-28.47	-27.94	-29.47	-29.09	-28.71	-28.14
MOL.WEIGHT (G)	136.864	136.864	136.864	149.502	149.502	149.502	149.502
C	1.3000	1.3000	1.3000	1.3500	1.3500	1.3500	1.3500
H	3.3000	3.3000	3.3000	3.3500	3.3500	3.3500	3.3500
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
BR	0.9000	0.9000	0.9000	1.0500	1.0500	1.0500	1.0500
DETN.VEL (M/SEC)	4962.9	4940.2	4904.5	4843.4	4827.8	4812.2	4790.7
PARTICL.VEL(")	1323.9	1356.6	1340.8	1292.6	1295.0	1296.6	1304.5
C-J PRESS (KBAR)	112.9	113.9	110.0	112.0	111.0	109.9	108.7
C-J VOLUME (CC/G)	0.42681	0.42670	0.43432	0.40979	0.41227	0.41485	0.41823
C-J TEMP (DEG K)	2629.5	2669.1	2688.1	2528.1	2547.3	2566.0	2597.6
C-J S(CAL/DEG MOL)	54.70	54.85	54.88	54.59	54.66	54.73	54.83
C-J ENERGY (CAL/G)	209.45	219.93	214.85	199.68	200.40	200.91	203.35
GAMMA	2.749	2.642	2.658	2.747	2.728	2.711	2.673
C-J DETN.HEAT(CAL)	582.8	584.7	587.9	530.2	532.5	534.8	538.2
LAMDA	10.8781	10.8764	10.8855	11.2669	11.2704	11.2738	11.2777
VOLUM(K LITTRE/KG)	0.5142	0.5148	0.5172	0.4842	0.4851	0.4860	0.4874
TOTAL PRODCT(MOLE)	3.8857	3.8849	3.8836	4.0367	4.0361	4.0354	4.0344
V GAS (MOLES)	2.8766	2.8801	2.8934	2.9588	2.9642	2.9698	2.9782
V GAS (CC/MOLE)	18.8555	18.8354	19.1195	19.1990	19.2943	19.3935	19.5171
V SOL C(S) (CC/G)	0.34448	0.34408	0.34657	0.34441	0.34515	0.34592	0.34681
H2O (MOL %)	38.0818	37.9903	37.5241	37.2543	37.0672	36.8729	36.5907
CO2 (MOL %)	5.9184	5.9106	6.0193	5.5636	5.6114	5.6595	5.7207
CO (MOL %)	1.5508	1.6672	1.9325	1.1629	1.2623	1.3683	1.5404
N2 (MOL %)	12.7006	12.6952	12.6878	12.2357	12.2316	12.2276	12.2212
H2 (MOL %)	0.6979	0.7429	0.8498	0.5578	0.5991	0.6426	0.7121
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.3338	0.3494	0.3733	0.3012	0.3130	0.3250	0.3439
OH (MOL %)	0.0017	0.0020	0.0022	0.0010	0.0011	0.0012	0.0014
H (MOL %)	0.0003	0.0004	0.0005	0.0002	0.0002	0.0002	0.0003
CH4 (MOL %)	0.0183	0.0198	0.0249	0.0149	0.0166	0.0185	0.0217
NO (MOL %)	0.0005	0.0006	0.0007	0.0003	0.0003	0.0004	0.0004
HBR (MOL %)	6.2916	6.3470	7.0017	6.4008	6.6623	6.9332	7.3097
BR2 (MOL %)	8.4354	8.4097	8.0862	9.8054	9.6767	9.5432	9.3582
C(S) (MOL %)	25.9689	25.8649	25.4970	26.7021	26.5582	26.4074	26.1793

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

EXPLOSIVES	NM/CHBR3 1/0.4 ,278 K	#NM/CHBR3 1/0.4 ,288 K	#NM/CHBR3 1/0.4 ,298 K	#NM/CHBR3 1/0.4 ,313 K	#NM/C2H2BR4 90/10 VOL %	#NM/C2H2BR4 # 80/20
RHO (G/CC)	1.850	1.830	1.810	1.780	1.322	1.504
EO (KCAL/MOLE)	-29.75	-28.95	-28.95	-28.35	-48.39	-46.83
MOL.WEIGHT (G)	162.139	162.139	162.139	162.139	131.190	149.580
C	1.4000	1.4000	1.4000	1.4000	1.8348	1.8217
H	3.4000	3.4000	3.4000	3.4000	5.1611	4.7784
N	1.0000	1.0000	1.0000	1.0000	1.6632	1.4784
O	2.0000	2.0000	2.0000	2.0000	3.3263	2.9567
BR	1.2000	1.2000	1.2000	1.2000	0.3433	0.6867
DETN.VEL (M/SEC)	4737.5	4720.2	4692.0	4658.8	5836.1	5392.5
PARTICL.VEL(")	1264.9	1271.6	1266.2	1260.1	1563.4	1448.2
C-J PRESS (KBAR)	110.9	109.8	107.5	104.5	120.6	117.5
C-J VOLUME (CC/G)	0.39622	0.39924	0.40339	0.40984	0.55379	0.48633
C-J TEMP (DEG K)	2442.5	2478.0	2487.4	2516.2	3047.2	2787.1
C-J S(CAL/DEG MOL)	54.50	54.64	54.66	54.74	54.48	54.56
C-J ENERGY (CAL/G)	191.21	193.23	191.58	189.76	292.10	250.64
GAMMA	2.745	2.712	2.706	2.697	2.733	2.723
C-J DETN.HEAT(CAL)	487.5	492.2	492.3	495.9	996.1	762.7
LAMDA	11.6319	11.6366	11.6435	11.6530	8.6222	9.4974
VOLUM(K LITTRE/KG)	0.4593	0.4605	0.4616	0.4637	0.7695	0.6358
TOTAL PRODCT(MOLE)	4.1873	4.1863	4.1857	4.1845	5.3914	5.2724
V GAS (MOLES)	3.0442	3.0519	3.0593	3.0728	4.1261	3.8875
V GAS (CC/MOLE)	19.5489	19.6687	19.8454	20.1096	16.3472	17.2463
V SOL C(S) (CC/G)	0.34459	0.34542	0.34688	0.34893	0.34230	0.34266
H2O (MOL %)	36.4175	36.1516	35.8771	35.4031	44.1997	41.6352
CO2 (MOL %)	5.2222	5.2949	5.3851	5.5235	6.9474	6.1733
CO (MOL %)	0.9014	1.0320	1.1332	1.3447	3.5884	2.0937
N2 (MOL %)	11.8016	11.7953	11.7919	11.7850	15.1930	13.8370
H2 (MOL %)	0.4621	0.5181	0.5610	0.6480	1.4257	0.9228
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.2782	0.2963	0.3065	0.3277	0.4583	0.3643
OH (MOL %)	0.0006	0.0007	0.0008	0.0009	0.0110	0.0038
H (MOL %)	0.0001	0.0001	0.0002	0.0002	0.0026	0.0008
CH4 (MOL %)	0.0128	0.0152	0.0173	0.0218	0.0274	0.0186
NO (MOL %)	0.0002	0.0002	0.0002	0.0003	0.0038	0.0013
HBR (MOL %)	6.5521	6.9267	7.3623	8.0787	2.9794	4.3431
BR2 (MOL %)	11.0531	10.8690	10.6533	10.2994	1.6943	4.3403
C(S) (MOL %)	27.2982	27.1000	26.9112	26.5668	23.4689	26.2660

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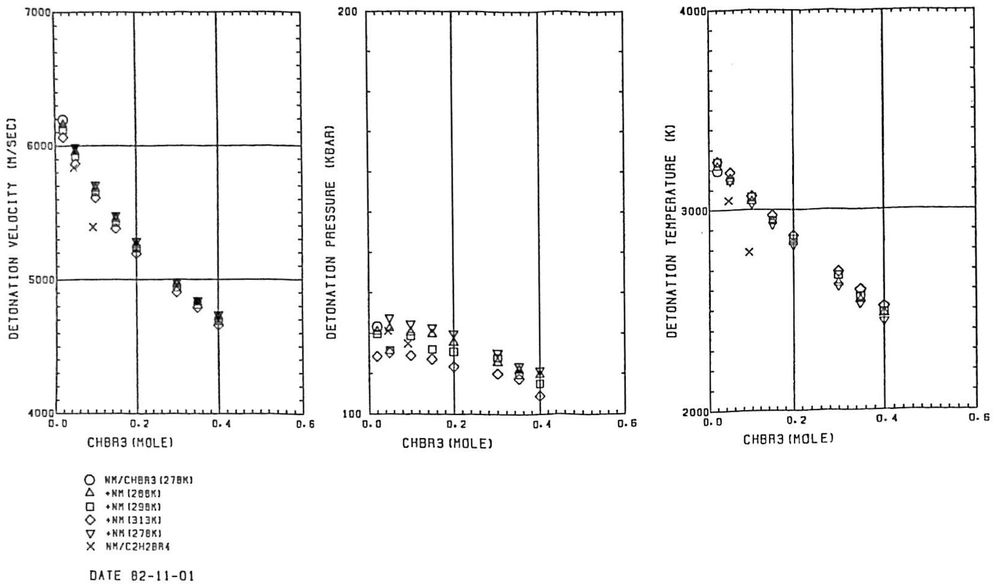
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	TFNA	# FEFO	# TFENA	# TFET	# PF	# DFTNB	#LX-04;HMX85/# VITON15
RHO (G/CC)	1.692	1.590	1.523	1.786	1.830	1.851	1.865
EO (KCAL/MOLE)	-158.00	-178.00	-152.00	-112.00	-36.00	-75.00	-2.88
MOL.WEIGHT (G)	276.130	320.121	144.054	355.145	231.098	249.088	100.000
C	5.0000	5.0000	2.0000	8.0000	6.0000	6.0000	1.5490
H	7.0000	6.0000	3.0000	4.0000	2.0000	1.0000	2.5767
N	4.0000	4.0000	2.0000	5.0000	3.0000	3.0000	2.2961
O	6.0000	10.0000	2.0000	8.0000	6.0000	6.0000	2.2961
F	3.0000	2.0000	3.0000	3.0000	1.0000	2.0000	0.5212
DETN.VEL (M/SEC)	7331.4	7362.6	6260.8	7397.2	7492.9	7389.5	8616.2
PARTICL.VEL(")	1853.6	1873.0	1579.1	1905.6	1943.0	1880.8	2158.3
C-J PRESS (KBAR)	229.9	219.3	150.6	251.8	266.4	257.2	346.8
C-J VOLUME (CC/G)	0.44159	0.46893	0.49099	0.41567	0.40475	0.40275	0.40188
C-J TEMP (DEG K)	3355.6	3809.7	3021.6	3797.8	3915.2	3892.0	3668.5
C-J S(CAL/DEG MOL)	53.39	54.92	47.38	57.64	62.13	63.29	54.04
C-J ENERGY (CAL/G)	410.58	419.25	297.98	433.93	451.15	422.70	556.75
GAMMA	2.955	2.931	2.965	2.882	2.856	2.929	2.992
C-J DETN.HEAT(CAL)	1218.7	1337.2	928.7	1279.3	1339.0	1286.9	1488.5
LAMDA	7.8856	9.4025	7.0170	9.2889	10.3150	11.7361	8.5003
VOLUM(K LITTRE/KG)	0.8064	0.7916	0.8641	0.6872	0.6244	0.5803	0.8191
TOTAL PRODCT(MOLE)	12.0016	11.0071	5.9995	14.0106	9.0084	8.5077	4.2494
V GAS (MOLES)	9.1019	10.3583	5.0878	9.9751	5.8977	5.9081	3.3480
V GAS (CC/MOLE)	12.2964	14.2705	13.2020	13.4401	14.1255	15.5126	11.2315
V SOL C(S) (CC/G)	0.28761	0.29466	0.32520	0.27972	0.27377	0.27770	0.23879
H2O (MOL %)	16.5608	17.9217	0.0140	3.5329	5.4962	0.0007	24.0892
CO2 (MOL %)	15.8735	33.2013	15.1805	25.1140	28.8334	33.3352	14.4956
CO (MOL %)	1.6262	6.3293	2.9522	3.1825	3.2368	3.7013	0.7435
N2 (MOL %)	16.6372	18.0941	16.6638	17.7822	16.5723	17.5626	26.9255
CF4 (MOL %)	0.0000	0.0000	0.0069	0.0000	0.0000	2.9311	0.0000
H2 (MOL %)	0.0684	0.1594	0.0001	0.0189	0.0263	0.0000	0.0378
O2 (MOL %)	0.0012	0.0057	0.0001	0.0058	0.0084	0.0071	0.0063
NH3 (MOL %)	0.0167	0.0349	0.0000	0.0028	0.0063	0.0000	0.0255
OH (MOL %)	0.0192	0.0683	0.0002	0.0246	0.0357	0.0004	0.0400
H (MOL %)	0.0007	0.0034	0.0000	0.0008	0.0010	0.0000	0.0006
CH4 (MOL %)	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
NO (MOL %)	0.0376	0.1169	0.0086	0.1199	0.1504	0.1369	0.1569
HF (MOL %)	24.9970	18.1703	49.9767	21.4123	11.1006	11.7529	12.2667
F2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0152	0.0000
C(S) (MOL %)	24.1613	5.8943	15.1968	28.8031	34.5326	30.5565	21.2125

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C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
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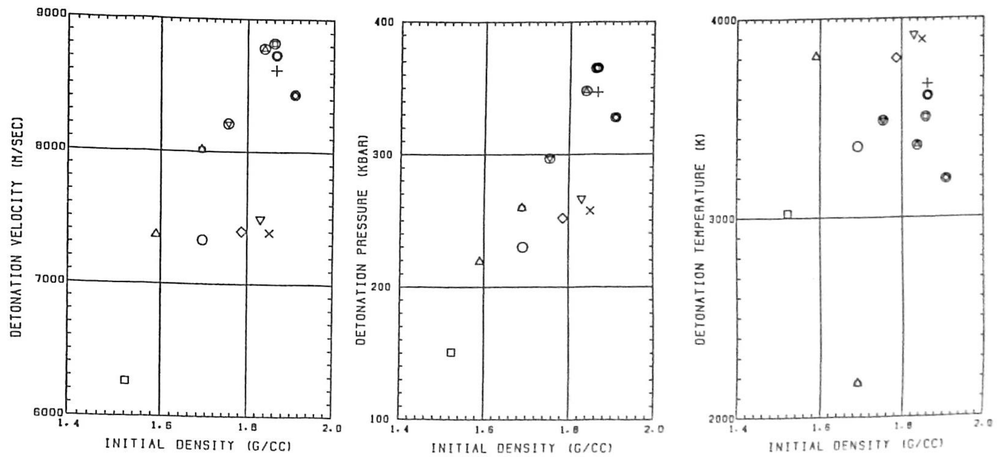
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	LX-07;HMX90/# VITON10	#HMX93.3/DNPA 4.4/FEFO2.3	#LX-10 HMX95/VITON5	#X0204 83/17 HMX/TEFLON	#RDX/TFNA 65/35	#NQ/VITON 95/5	#
RHO (G/CC)	1.865	1.838	1.860	1.909	1.754	1.690	
EO (KCAL/MOLE)	0.09	2.60	3.07	-28.98	-15.08	-21.19	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	
C	1.4828	1.3983	1.4167	1.4610	1.5117	1.0465	
H	2.6182	2.6657	2.6598	2.2421	2.6431	3.7450	
N	2.4311	2.6513	2.5662	2.2421	2.2628	3.6514	
O	2.4311	2.6944	2.5662	2.2421	2.5163	1.8257	
F	0.3475	0.0144	0.1737	0.6799	0.3803	0.1737	
DETN.VEL (M/SEC)	8728.7	8779.0	8819.1	8431.2	8210.8	8013.4	
PARTICL.VEL(")	2243.8	2155.8	2225.0	2036.3	2061.5	1915.3	
C-J PRESS (KBAR)	365.3	347.9	365.0	327.7	296.9	259.4	
C-J VOLUME (CC/G)	0.39836	0.41047	0.40200	0.39732	0.42699	0.45029	
C-J TEMP (DEG K)	3610.2	3360.3	3502.9	3190.5	3485.9	2171.4	
C-J S(CAL/DEG MOL)	53.85	53.14	53.48	51.66	53.86	45.49	
C-J ENERGY (CAL/G)	601.59	555.39	591.60	495.42	507.76	438.39	
GAMMA	2.890	3.072	2.964	3.140	2.983	3.184	
C-J DETN.HEAT(CAL)	1482.0	1438.4	1475.7	1286.5	1390.2	952.0	
LAMDA	8.7186	9.1573	8.9352	8.6136	8.7129	7.8148	
VOLUM(K LITTRE/KG)	0.8218	0.8218	0.8249	0.8123	0.8212	0.9310	
TOTAL PRODCT(MOLE)	4.1846	4.0654	4.1191	4.0442	4.1560	4.8301	
V GAS (MOLES)	3.3590	3.3591	3.3717	3.3203	3.3565	3.8052	
V GAS (CC/MOLE)	11.1775	11.6206	11.3085	11.3257	11.9809	10.9620	
V SOL C(S) (CC/G)	0.23100	0.23713	0.23069	0.24473	0.25882	0.26938	
H2O (MOL %)	27.0461	32.5302	30.0965	19.2843	27.1018	36.9070	
CO2 (MOL %)	15.1378	16.6035	15.7830	17.8568	16.1856	0.4435	
CO (MOL %)	0.5709	0.4222	0.4690	0.3690	0.9512	0.0045	
N2 (MOL %)	28.9575	32.5485	31.0713	27.6868	27.1627	37.7822	
CF4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
H2 (MOL %)	0.0296	0.0244	0.0256	0.0117	0.0548	0.0111	
O2 (MOL %)	0.0062	0.0029	0.0048	0.0018	0.0029	0.0000	
NH3 (MOL %)	0.0255	0.0279	0.0264	0.0077	0.0342	0.0324	
OH (MOL %)	0.0354	0.0202	0.0281	0.0106	0.0295	0.0001	
H (MOL %)	0.0004	0.0002	0.0003	0.0001	0.0006	0.0000	
CH4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NO (MOL %)	0.1574	0.0918	0.1318	0.0578	0.0883	0.0002	
HF (MOL %)	8.3053	0.3570	4.2200	16.8134	9.1515	3.6003	
F2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
C(S) (MOL %)	19.7278	17.3713	18.1434	17.8999	19.2371	21.2187	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

FEFO RHO = 1.5900 G/CC EO = -1.780000E+05 CAL/MOLE

LN P = -3.51756287 E+00 -2.37533092 E+00LN V 3.24283123 E-01LN V**2 -3.71174701 E-02LN V**3 1.53595977 E-03LN V**4

LN T = 7.89132404 E+00 -4.02678668 E-01LN V 9.28109288 E-02LN V**2 -1.65724307 E-02LN V**3 1.11875730 E-03LN V**4

LN E = -1.57168102 E+00 4.66598034 E-01LNP 7.38968253 E-02LN P**2 5.79262152 E-03LN P**3 1.68122177 E-04LN P**4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (513.744)	0.3549	4949.1 (4572.2)	-1399.3	0.15855 (0.15544)	3.1735	84.0
400.000 (407.375)	0.3821	4572.7 (4360.3)	-1061.6	0.14442 (0.14349)	3.1078	620.5
300.000 (302.903)	0.4209	4176.9 (4107.8)	-717.3	0.13001 (0.13054)	3.0239	1250.4
* 219.268 (219.408)	0.4690	3809.7 (3854.2)	-418.8	0.11752 (0.11897)	2.9328	1873.0
200.000 (199.088)	0.4849	3729.2 (3781.9)	-351.6	0.11471 (0.11599)	2.9054	2052.6
100.000 (96.939)	0.6269	3129.1 (3299.0)	67.2	0.09719 (0.09825)	2.7031	3243.1
80.000 (77.417)	0.6819	2953.4 (3165.4)	171.4	0.09283 (0.09392)	2.6403	3570.6
60.000 (58.367)	0.7602	2849.8 (3008.1)	273.5	0.08856 (0.08910)	2.5617	3955.9
50.000 (48.863)	0.8153	2787.0 (2914.8)	330.7	0.08617 (0.08642)	2.5124	4184.7
40.000 (39.348)	0.8896	2712.9 (2806.5)	393.8	0.08352 (0.08349)	2.4527	4450.3
30.000 (29.792)	0.9983	2621.1 (2675.8)	465.8	0.08051 (0.08018)	2.3764	4772.0
20.000 (20.133)	1.1818	2496.4 (2506.4)	552.7	0.07688 (0.07627)	2.2701	5191.3
10.000 (10.230)	1.6125	2292.0 (2249.3)	672.0	0.07188 (0.07112)	2.0902	5836.7
8.000 (8.203)	1.7948	2225.2 (2174.1)	705.4	0.07049 (0.06977)	2.0328	6028.7
6.000 (6.150)	2.0735	2141.5 (2081.6)	744.7	0.06884 (0.06821)	1.9592	6267.4
5.000 (5.112)	2.2813	2090.6 (2025.5)	767.5	0.06789 (0.06731)	1.9127	6414.1
4.000 (4.079)	2.5717	2025.1 (1960.0)	795.0	0.06674 (0.06628)	1.8569	6587.1
3.000 (3.042)	3.0214	1944.2 (1879.6)	827.7	0.06537 (0.06505)	1.7860	6802.5
2.000 (2.010)	3.8346	1833.3 (1774.3)	870.0	0.06360 (0.06348)	1.6899	7090.6
1.000 (0.994)	5.9365	1652.2 (1613.5)	934.2	0.06091 (0.06110)	1.5387	7545.5
0.800 (0.793)	6.8883	1595.9 (1566.0)	953.1	0.06012 (0.06038)	1.4943	7683.5
0.600 (0.594)	8.3925	1524.8 (1507.3)	976.6	0.05914 (0.05948)	1.4404	7856.2
0.500 (0.494)	9.5439	1480.5 (1471.4)	990.9	0.05854 (0.05892)	1.4084	7963.0
0.400 (0.395)	11.2098	1427.5 (1428.6)	1007.9	0.05783 (0.05824)	1.3716	8091.3
0.300 (0.297)	13.8688	1361.2 (1375.2)	1029.0	0.05695 (0.05738)	1.3281	8252.8
0.200 (0.198)	18.9121	1273.9 (1302.6)	1057.5	0.05575 (0.05617)	1.2749	8474.3
0.100 (0.100)	32.9319	1146.5 (1184.6)	1103.6	0.05383 (0.05412)	1.2065	8839.4
0.080 (0.080)	39.6259	1112.6 (1147.9)	1117.2	0.05325 (0.05347)	1.1904	8954.4
0.060 (0.060)	50.4253	1071.6 (1101.9)	1134.6	0.05253 (0.05264)	1.1739	9100.2
0.050 (0.050)	58.8309	1047.3 (1073.5)	1145.3	0.05208 (0.05212)	1.1658	9191.4
0.040 (0.040)	71.1289	1019.1 (1039.7)	1158.1	0.05154 (0.05150)	1.1581	9301.7
0.030 (0.030)	91.3489	989.6 (997.1)	1174.4	0.05086 (0.05072)	1.1515	9444.2
0.020 (0.020)	130.1338	949.6 (940.9)	1196.4	0.04994 (0.04967)	1.1481	9640.7
0.010 (0.010)	238.1479	882.3 (857.9)	1231.3	0.04848 (0.04809)	1.1539	9964.6
0.008 (0.008)	288.9578	860.2 (835.3)	1242.1	0.04803 (0.04766)	1.1578	10065.4
0.006 (0.006)	370.6074	831.8 (809.6)	1255.3	0.04748 (0.04717)	1.1635	10193.1
0.005 (0.005)	433.8462	813.9 (795.3)	1263.2	0.04715 (0.04691)	1.1673	10272.8
0.004 (0.004)	525.3872	791.4 (780.4)	1272.8	0.04675 (0.04664)	1.1719	10368.4
0.003 (0.003)	671.4390	761.7 (765.4)	1284.7	0.04625 (0.04638)	1.1772	10488.9
0.002 (0.002)	945.5557	718.8 (753.2)	1300.5	0.04559 (0.04624)	1.1829	10653.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

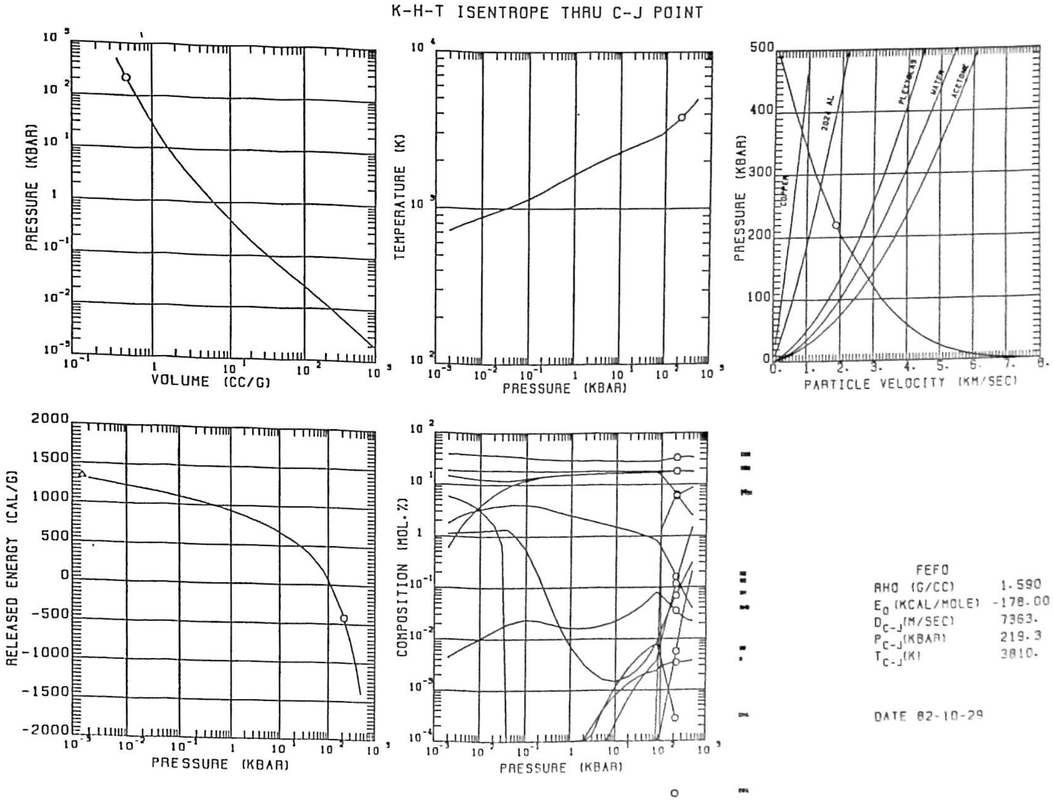
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-29>> **********

FEFO RHO = 1.5900 G/CC EO = -1.780000E+05 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O / F2	CO2 / C(S)	CO	N2	CF4	H2	O2	NH3	OH	H	CH4	NO	HF
219.268	1.97255 / 0.00000	3.65315 / 0.64729	0.69954	1.99165	0.00000	0.01763	0.00063	0.00386	0.00752	0.00038	0.00003	0.01284	2.00003
200.000	1.96887 / 0.00000	3.61036 / 0.59627	0.79333	1.99300	0.00000	0.02122	0.00042	0.00425	0.00649	0.00039	0.00004	0.00975	2.00003
100.000	1.91900 / 0.00000	3.22485 / 0.14594	1.62881	1.99566	0.00000	0.06747	0.00001	0.00775	0.00153	0.00032	0.00048	0.00093	2.00004
80.000	1.89459 / 0.00000	3.10497 / 0.0	1.89418	1.99533	0.00000	0.08963	0.00000	0.00892	0.00088	0.00026	0.00091	0.00041	2.00004
60.000	1.88750 / 0.00000	3.11193 / 0.0	1.88756	1.99640	0.00000	0.10047	0.00000	0.00689	0.00076	0.00025	0.00058	0.00031	2.00004
50.000	1.88245 / 0.00000	3.11703 / 0.0	1.88255	1.99690	0.00000	0.10724	0.00000	0.00595	0.00067	0.00024	0.00046	0.00026	2.00004
40.000	1.87592 / 0.00000	3.12363 / 0.0	1.87605	1.99738	0.00000	0.11540	0.00000	0.00504	0.00058	0.00022	0.00035	0.00020	2.00004
30.000	1.86714 / 0.00000	3.13250 / 0.0	1.86726	1.99785	0.00000	0.12574	0.00000	0.00417	0.00045	0.00019	0.00027	0.00014	2.00004
20.000	1.85432 / 0.00000	3.14544 / 0.0	1.85442	1.99831	0.00000	0.14006	0.00000	0.00331	0.00031	0.00015	0.00020	0.00008	2.00004
10.000	1.83135 / 0.00000	3.16857 / 0.0	1.83136	1.99877	0.00000	0.16453	0.00000	0.00244	0.00013	0.00009	0.00016	0.00002	2.00005
8.000	1.82333 / 0.00000	3.17668 / 0.0	1.82320	1.99886	0.00000	0.17283	0.00000	0.00227	0.00009	0.00007	0.00016	0.00002	2.00005
6.000	1.81257 / 0.00000	3.18746 / 0.0	1.81245	1.99895	0.00000	0.18386	0.00000	0.00209	0.00006	0.00005	0.00017	0.00001	2.00006
5.000	1.80556 / 0.00000	3.19450 / 0.0	1.80540	1.99900	0.00000	0.19102	0.00000	0.00199	0.00004	0.00004	0.00018	0.00001	2.00006
4.000	1.79611 / 0.00000	3.20405 / 0.0	1.79578	1.99904	0.00000	0.20056	0.00000	0.00191	0.00003	0.00003	0.00020	0.00000	2.00006
3.000	1.78321 / 0.00000	3.21693 / 0.0	1.78291	1.99908	0.00000	0.21350	0.00000	0.00183	0.00001	0.00002	0.00024	0.00000	2.00007
2.000	1.76297 / 0.00000	3.23732 / 0.0	1.76239	1.99912	0.00000	0.23365	0.00000	0.00177	0.00001	0.00001	0.00034	0.00000	2.00007
1.000	1.72071 / 0.00000	3.28002 / 0.0	1.71927	1.99911	0.00000	0.27500	0.00000	0.00179	0.00000	0.00000	0.00078	0.00000	2.00009
0.800	1.70433 / 0.00000	3.29669 / 0.0	1.70232	1.99909	0.00000	0.29069	0.00000	0.00183	0.00000	0.00000	0.00109	0.00000	2.00009
0.600	1.68062 / 0.00000	3.32114 / 0.0	1.67712	1.99904	0.00000	0.31290	0.00000	0.00191	0.00000	0.00000	0.00178	0.00000	2.00010
0.500	1.66380 / 0.00000	3.33867 / 0.0	1.65889	1.99901	0.00000	0.32818	0.00000	0.00198	0.00000	0.00000	0.00250	0.00000	2.00010
0.400	1.64100 / 0.00000	3.36288 / 0.0	1.63329	1.99896	0.00000	0.34803	0.00000	0.00209	0.00000	0.00000	0.00390	0.00000	2.00011
0.300	1.60750 / 0.00000	3.39965 / 0.0	1.59325	1.99888	0.00000	0.37478	0.00000	0.00224	0.00000	0.00000	0.00715	0.00000	2.00012
0.200	1.55141 / 0.00000	3.46562 / 0.0	1.51741	1.99878	0.00000	0.41081	0.00000	0.00245	0.00000	0.00000	0.01702	0.00000	2.00013
0.100	1.43404 / 0.00000	3.62406 / 0.0	1.31790	1.99873	0.00000	0.44579	0.00000	0.00256	0.00000	0.00000	0.05813	0.00000	2.00015
0.080	1.39500 / 0.00000	3.68163 / 0.0	1.24182	1.99877	0.00000	0.44798	0.00000	0.00248	0.00000	0.00000	0.07662	0.00000	2.00015
0.050	1.31194 / 0.00000	3.81034 / 0.0	1.06747	1.99890	0.00000	0.44014	0.00000	0.00222	0.00000	0.00000	0.12226	0.00000	2.00016
0.040	1.27369 / 0.00000	3.87184 / 0.0	0.98271	1.99897	0.00000	0.43198	0.00000	0.00207	0.00000	0.00000	0.14558	0.00000	2.00017
0.030	1.28586 / 0.00000	3.93154 / 0.07188	0.85115	1.99910	0.00000	0.42037	0.00000	0.00182	0.00000	0.00000	0.14548	0.00000	2.00018
0.020	1.31433 / 0.00000	4.00467 / 0.17789	0.67644	1.99925	0.00000	0.40112	0.00000	0.00152	0.00000	0.00000	0.14110	0.00000	2.00019
0.010	1.37140 / 0.00000	4.10442 / 0.34116	0.41986	1.99946	0.00000	0.35767	0.00000	0.00110	0.00000	0.00000	0.13460	0.00000	2.00020
0.008	1.39339 / 0.00000	4.12944 / 0.38997	0.34785	1.99952	0.00000	0.33952	0.00000	0.00099	0.00000	0.00000	0.13276	0.00000	2.00021
0.006	1.42341 / 0.00000	4.15504 / 0.44788	0.26664	1.99958	0.00000	0.31425	0.00000	0.00086	0.00000	0.00000	0.13048	0.00000	2.00022
0.005	1.44327 / 0.00000	4.16729 / 0.48145	0.22228	1.99962	0.00000	0.29742	0.00000	0.00078	0.00000	0.00000	0.12902	0.00000	2.00023
0.004	1.47015 / 0.00000	4.17859 / 0.52142	0.17280	1.99966	0.00000	0.27424	0.00000	0.00070	0.00000	0.00000	0.12723	0.00000	2.00023
0.003	1.50751 / 0.00000	4.18649 / 0.56917	0.11966	1.99971	0.00000	0.24200	0.00000	0.00060	0.00000	0.00000	0.12475	0.00000	2.00024
0.002	1.56474 / 0.00000	4.18534 / 0.62950	0.06474	1.99978	0.00000	0.19348	0.00000	0.00047	0.00000	0.00000	0.12048	0.00000	2.00026
300.000	1.97848 / 0.00000	3.74437 / 0.77801	0.47762	1.98053	0.00000	0.00994	0.00275	0.00299	0.01372	0.00039	0.00001	0.03594	2.00003
400.000	1.97865 / 0.00000	3.77632 / 0.88319	0.34050	1.95549	0.00000	0.00601	0.00951	0.00252	0.02268	0.00040	0.00000	0.08651	2.00003
500.000	1.97533 / 0.00000	3.75433 / 0.96870	0.27698	1.91792	0.00000	0.00436	0.02225	0.00245	0.03281	0.00042	0.00000	0.16171	2.00002

PRESS ;KBAR, PRODUCTS ;MOLES

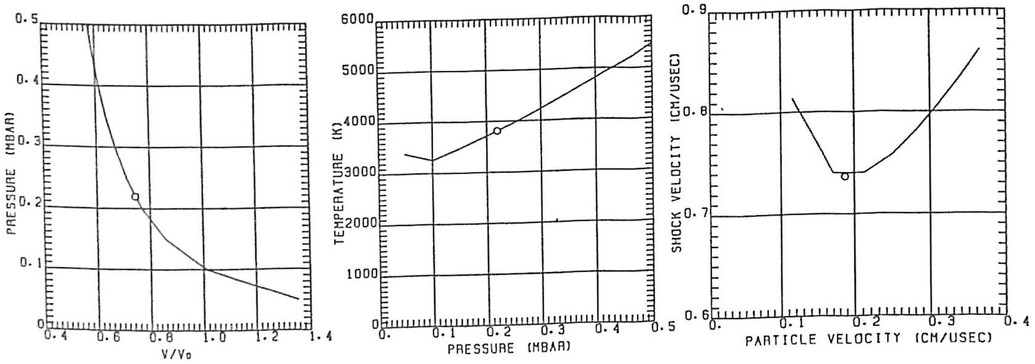


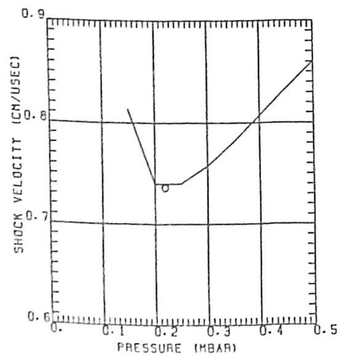
********** A K-H-T H U G O N I O T <<DATE 82-10-29>>**********

FEFO RHO = 1.5900 G/CC, EO = -1.780000E+05 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3617	0.3728	0.3860	0.4021	0.4222	0.4483	0.4845	0.5392	0.6362	0.8524
TEMP (DEG K)	5469.1	5117.0	4804.3	4513.9	4233.8	3966.3	3714.9	3479.3	3254.8	3388.8
US (M/SEC)	8603.1	8336.3	8071.1	7812.7	7576.5	7399.2	7400.2	8132.0	0.0	0.0
UP (M/SEC)	3655.2	3395.0	3116.9	2817.5	2490.3	2125.0	1699.7	1160.1	0.0	0.0
H2O (MOLE)	1.9686	1.9674	1.9705	1.9746	1.9765	1.9755	1.9695	1.9526	1.9030	1.8886
CO2 (MOLE)	3.7036	3.6904	3.7078	3.7274	3.7245	3.6939	3.6174	3.4531	3.0939	3.0993
CO (MOLE)	0.4168	0.4329	0.4459	0.4666	0.5143	0.6041	0.7791	1.1331	1.9055	1.9007
N2 (MOLE)	1.9291	1.9263	1.9432	1.9643	1.9789	1.9881	1.9932	1.9952	1.9949	1.9962
CF4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2 (MOLE)	0.0075	0.0078	0.0083	0.0092	0.0108	0.0141	0.0208	0.0365	0.0813	0.1021
O2 (MOLE)	0.0168	0.0184	0.0129	0.0067	0.0030	0.0012	0.0004	0.0001	0.0000	0.0002
NH3 (MOLE)	0.0038	0.0035	0.0033	0.0031	0.0032	0.0035	0.0042	0.0056	0.0088	0.0032
OH (MOLE)	0.0358	0.0383	0.0318	0.0224	0.0152	0.0099	0.0063	0.0038	0.0023	0.0074
H (MOLE)	0.0007	0.0008	0.0007	0.0005	0.0005	0.0004	0.0004	0.0004	0.0005	0.0014
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0006	0.0001
NO (MOLE)	0.1380	0.1439	0.1103	0.0683	0.0389	0.0202	0.0095	0.0039	0.0014	0.0044
HF (MOLE)	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
F2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	0.8796	0.8767	0.8463	0.8061	0.7612	0.7019	0.6035	0.4136	0.0	0.0

K-H-T HUGONIOT





FEFO
RHO (G/CC) 1.590
E_0 (KCAL/MOLE) -178.00

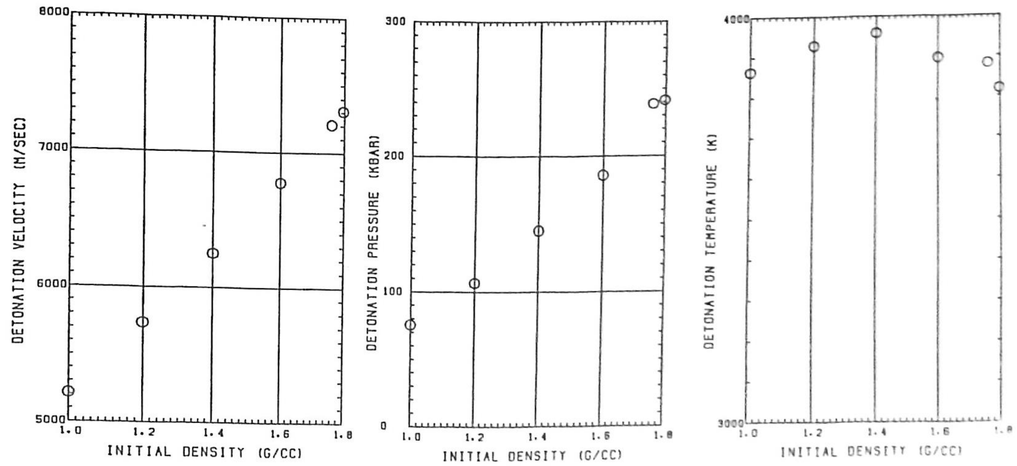
DATE 82-10-29

********** K-H-T C-J DETONATION PROPERTIES <<DATE 82-11-02>> **********

EXPLOSIVES	TRICHLENE #	TRICHLENE #	TRICHLENE #	TRICHLENE #	TRICHLENE #	TRICHLENE #
RHO (G/CC)	1.797	1.760	1.600	1.400	1.200	1.000
EO (KCAL/MOLE)	6.41	6.41	6.41	6.41	6.41	6.41
MOL.WEIGHT (G)	247.552	247.552	247.552	247.552	247.552	247.552
C	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
H	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
N	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000
O	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
CL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
DETN.VEL (M/SEC)	7309.6	7208.9	6776.2	6250.1	5736.0	5211.4
PARTICL.VEL(")	1835.3	1880.0	1712.1	1657.9	1549.3	1446.0
C-J PRESS (KBAR)	241.1	238.5	185.6	145.1	106.6	75.4
C-J VOLUME (CC/G)	0.41676	0.42001	0.46708	0.52482	0.60825	0.72253
C-J TEMP (DEG K)	3818.3	3880.7	3895.5	3958.2	3927.0	3863.4
C-J S(CAL/DEG MOL)	62.49	62.62	61.91	60.49	58.06	55.27
C-J ENERGY (CAL/G)	402.51	422.38	350.30	328.45	286.84	249.88
GAMMA	2.983	2.834	2.958	2.770	2.702	2.604
C-J DETN.HEAT(CAL)	1245.4	1241.5	1211.7	1159.3	1083.1	990.7
LAMDA	11.5233	11.5017	11.3264	11.0455	10.6828	10.3054
VOLUM(K LITTRE/KG)	0.5845	0.5866	0.6048	0.6364	0.6825	0.7388
TOTAL PRODCT(MOLE)	9.0055	9.0061	9.0044	9.0033	9.0006	8.9967
V GAS (MOLES)	5.9148	5.9361	6.1201	6.4391	6.9063	7.4758
V GAS (CC/MOLE)	15.6565	15.7388	17.1305	18.5825	20.5044	23.0023
V SOL C(S) (CC/G)	0.28464	0.28604	0.31141	0.33337	0.35642	0.37793
H2O (MOL %)	5.5192	5.5118	5.4425	5.2963	4.9964	4.4006
CO2 (MOL %)	28.6619	28.4224	26.4626	23.0662	18.1855	12.4529
CO (MOL %)	3.6447	4.1105	8.1391	15.0953	25.2046	37.3229
N2 (MOL %)	16.6014	16.5945	16.6087	16.6135	16.6238	16.6309
H2 (MOL %)	0.0327	0.0376	0.0913	0.2134	0.4811	1.0268
O2 (MOL %)	0.0046	0.0052	0.0032	0.0022	0.0010	0.0004
NH3 (MOL %)	0.0090	0.0098	0.0157	0.0252	0.0391	0.0590
OH (MOL %)	0.0279	0.0321	0.0369	0.0450	0.0437	0.0365
H (MOL %)	0.0009	0.0012	0.0028	0.0068	0.0138	0.0253
CH4 (MOL %)	0.0000	0.0000	0.0002	0.0008	0.0031	0.0111
NO (MOL %)	0.1012	0.1117	0.0838	0.0691	0.0443	0.0248
HCL (MOL %)	11.0493	11.0455	11.0563	11.0646	11.0788	11.0929
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOL %)	0.0277	0.0292	0.0248	0.0214	0.0159	0.0112
C(S) (MOL %)	34.3195	34.0885	32.0320	28.4803	23.2689	16.9045

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



O TRICHLENE

DATE 82-11-02

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

TRICHLENE RHO = 1.7970 G/CC EO = 6.413000E+03 CAL/MOLE

LN P = -3.81046009 E+00 -2.41194534 E+00LN V 3.34355652 E-01LN V*2 -3.42987515 E-02LN V*3 1.10062957 E-03LN V*4

LN T = 7.73221684 E+00 -4.60071266 E-01LN V 1.48584783 E-01LN V*2 -2.55647711 E-02LN V*3 1.56591274 E-03LN V*4

LN E = -1.64214134 E+00 4.33418095 E-01LNP 7.08594322 E-02LN P*2 5.52234054 E-03LN P*3 1.57877192 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (543.223)	0.3234	4925.7 (4818.9)	-1229.5	0.15144 (0.14803)	3.3044	280.2
400.000 (418.108)	0.3503	4502.5 (4490.0)	-911.3	0.13813 (0.13753)	3.2316	807.8
300.000 (304.924)	0.3868	4083.3 (4131.6)	-596.1	0.12494 (0.12612)	3.1437	1415.2
* 241.068 (241.730)	0.4168	3818.3 (3892.1)	-402.3	0.11683 (0.11877)	3.0789	1835.3
200.000 (196.905)	0.4458	3677.3 (3696.1)	-284.9	0.11192 (0.11325)	3.0217	2195.4
100.000 (94.912)	0.5724	3138.1 (3101.7)	67.6	0.09717 (0.09755)	2.8178	3319.0
80.000 (75.624)	0.6211	2976.0 (2945.1)	155.5	0.09350 (0.09373)	2.7543	3625.0
60.000 (56.729)	0.6905	2781.0 (2763.7)	253.7	0.08938 (0.08948)	2.6740	3986.4
50.000 (47.408)	0.7389	2666.7 (2659.2)	308.3	0.08710 (0.08713)	2.6239	4198.7
40.000 (38.134)	0.8036	2537.8 (2540.7)	367.5	0.08463 (0.08456)	2.5632	4443.3
30.000 (28.576)	0.9009	2388.8 (2396.7)	433.6	0.08186 (0.08168)	2.4828	4747.8
20.000 (19.508)	1.0542	2205.6 (2226.8)	511.0	0.07862 (0.07832)	2.3769	5119.3
10.000 (10.159)	1.4025	1959.6 (1983.5)	611.6	0.07441 (0.07400)	2.1973	5683.9
8.000 (8.214)	1.5469	1894.7 (1915.5)	637.8	0.07332 (0.07290)	2.1394	5851.3
6.000 (6.231)	1.7642	1819.0 (1834.3)	668.4	0.07204 (0.07163)	2.0647	6058.4
5.000 (5.218)	1.9245	1775.0 (1786.2)	686.2	0.07129 (0.07091)	2.0170	6185.7
4.000 (4.190)	2.1491	1724.9 (1730.7)	706.7	0.07043 (0.07010)	1.9586	6337.5
3.000 (3.146)	2.4950	1665.5 (1664.6)	731.3	0.06940 (0.06915)	1.8832	6527.1
2.000 (2.087)	3.1226	1590.4 (1581.1)	762.9	0.06808 (0.06795)	1.7774	6783.6
1.000 (1.025)	4.7588	1480.2 (1463.1)	811.0	0.06607 (0.06616)	1.6025	7193.9
0.800 (0.814)	5.5064	1448.5 (1431.0)	825.2	0.06547 (0.06562)	1.5488	7319.1
0.600 (0.605)	6.6977	1409.7 (1393.1)	843.0	0.06473 (0.06495)	1.4821	7476.5
0.500 (0.502)	7.6182	1386.2 (1370.9)	854.0	0.06427 (0.06452)	1.4415	7574.1
0.400 (0.398)	8.9634	1358.2 (1345.4)	867.2	0.06372 (0.06400)	1.3938	7691.8
0.300 (0.296)	11.1425	1323.5 (1314.7)	883.9	0.06302 (0.06333)	1.3362	7840.6
0.200 (0.195)	15.3603	1276.5 (1274.5)	907.0	0.06205 (0.06238)	1.2633	8045.5
0.100 (0.097)	27.4086	1201.1 (1209.6)	945.3	0.06045 (0.06071)	1.1661	8383.2
0.080 (0.077)	33.2208	1178.2 (1188.8)	957.0	0.05996 (0.06017)	1.1428	8488.8
0.060 (0.058)	42.6739	1149.6 (1161.7)	972.0	0.05933 (0.05946)	1.1188	8622.7
0.050 (0.049)	50.0654	1131.9 (1144.2)	981.4	0.05894 (0.05902)	1.1070	8706.4
0.040 (0.039)	60.9025	1110.4 (1122.4)	993.0	0.05845 (0.05847)	1.0961	8807.6
0.030 (0.030)	78.5545	1084.0 (1093.9)	1007.2	0.05786 (0.05778)	1.0874	8937.1
0.020 (0.020)	112.6349	1048.2 (1053.0)	1026.4	0.05705 (0.05684)	1.0851	9117.5
0.010 (0.010)	209.1192	990.5 (984.9)	1057.7	0.05575 (0.05540)	1.1049	9421.6
0.008 (0.008)	255.3316	972.7 (964.6)	1067.3	0.05535 (0.05499)	1.1169	9518.5
0.006 (0.006)	330.3606	950.2 (940.3)	1079.3	0.05484 (0.05454)	1.1359	9642.8
0.005 (0.005)	388.9841	936.2 (926.5)	1086.8	0.05453 (0.05429)	1.1497	9721.1
0.004 (0.004)	475.1035	919.3 (911.5)	1095.8	0.05415 (0.05403)	1.1684	9816.3
0.003 (0.003)	614.8669	897.8 (896.1)	1107.1	0.05368 (0.05379)	1.1950	9937.8
0.002 (0.002)	884.2773	868.0 (883.9)	1122.4	0.05304 (0.05367)	1.2365	10106.2

	0.00000	2.39769												
0.050	0.29436	2.15140	1.40292	1.49977	0.17189	0.00000	0.00048	0.00000	0.00000	0.01650	0.00000	1.00009	0.00000	
	0.00000	2.42923												
0.040	0.29561	2.18954	1.32539	1.49979	0.17170	0.00000	0.00043	0.00000	0.00000	0.01600	0.00000	1.00008	0.00000	
	0.00000	2.46912												
0.030	0.29699	2.23580	1.23148	1.49982	0.17164	0.00000	0.00038	0.00000	0.00000	0.01538	0.00000	1.00011	0.00000	
	0.00000	2.51740												
0.020	0.29908	2.29907	1.10287	1.49985	0.17129	0.00000	0.00031	0.00000	0.00000	0.01456	0.00000	1.00011	0.00000	
	0.00000	2.58354												
0.010	0.30322	2.40150	0.89388	1.49990	0.16979	0.00000	0.00023	0.00000	0.00000	0.01330	0.00000	1.00012	0.00000	
	0.00000	2.69137												
0.008	0.30475	2.43276	0.82983	1.49991	0.16902	0.00000	0.00021	0.00000	0.00000	0.01293	0.00000	1.00014	0.00000	
	0.00000	2.72452												
0.006	0.30693	2.47173	0.74971	1.49992	0.16776	0.00000	0.00018	0.00000	0.00000	0.01250	0.00000	1.00012	0.00000	
	0.00000	2.76611												
0.005	0.30844	2.49564	0.70039	1.49993	0.16677	0.00000	0.00017	0.00000	0.00000	0.01224	0.00000	1.00015	0.00000	
	0.00000	2.79177												
0.004	0.31047	2.52397	0.64169	1.49994	0.16537	0.00000	0.00015	0.00000	0.00000	0.01194	0.00000	1.00014	0.00000	
	0.00000	2.82243												
0.003	0.31340	2.55894	0.56885	1.49994	0.16318	0.00000	0.00013	0.00000	0.00000	0.01158	0.00000	1.00017	0.00000	
	0.00000	2.86068												
0.002	0.31825	2.60507	0.47173	1.49996	0.15925	0.00000	0.00011	0.00000	0.00000	0.01114	0.00000	1.00017	0.00000	
	0.00000	2.91210												
300.000	0.49858	2.61271	0.25098	1.49022	0.00199	0.00116	0.00072	0.00384	0.00009	0.00000	0.01884	0.99282	0.00000	
	0.00360	3.13631												
400.000	0.49996	2.62724	0.18354	1.47613	0.00125	0.00417	0.00067	0.00661	0.00009	0.00000	0.04707	0.98888	0.00000	
	0.00557	3.18923												
500.000	0.50022	2.60982	0.15723	1.45353	0.00097	0.01026	0.00072	0.01017	0.00011	0.00000	0.09221	0.98517	0.00000	
	0.00743	3.23295												

PRESS ;KBAR, PRODUCTS ;MOLES

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

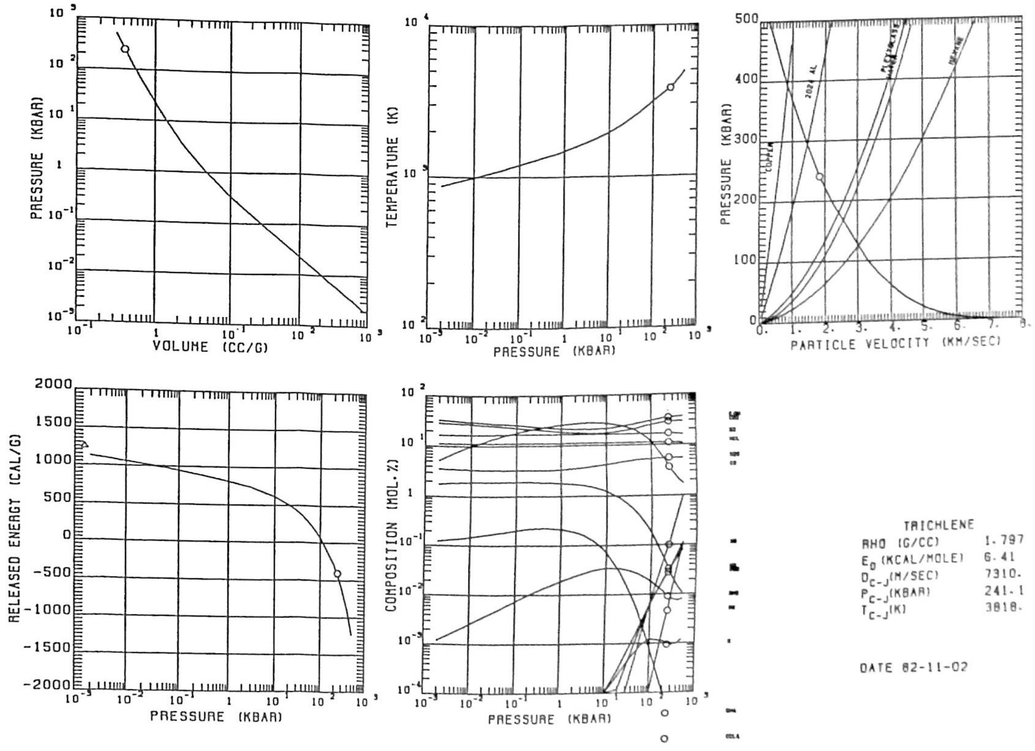
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

TRICHLENE RHO = 1.7970 G/CC EO = 6.413000E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O / CL2	CO2 / C(S)	CO	N2	H2	O2	NH3	OH	H	CH4	NO	HCL	CCL4
241.068	0.49703	2.58083	0.32886	1.49504	0.00295	0.00041	0.00081	0.00251	0.00008	0.00000	0.00910	0.99504	0.00000
	0.00249	3.09031											
200.000	0.49487	2.52434	0.44859	1.49677	0.00453	0.00020	0.00097	0.00199	0.00010	0.00001	0.00548	0.99621	0.00000
	0.00191	3.02707											
100.000	0.48163	2.24312	1.03090	1.49885	0.01597	0.00001	0.00166	0.00057	0.00011	0.00007	0.00063	0.99888	0.00000
	0.00058	2.72591											
80.000	0.47509	2.14259	1.23909	1.49890	0.02194	0.00000	0.00190	0.00035	0.00010	0.00013	0.00029	0.99928	0.00000
	0.00038	2.61820											
60.000	0.46489	2.01882	1.49718	1.49884	0.03133	0.00000	0.00221	0.00018	0.00008	0.00028	0.00011	0.99960	0.00000
	0.00022	2.48373											
50.000	0.45741	1.94642	1.64958	1.49878	0.03819	0.00000	0.00239	0.00011	0.00006	0.00044	0.00006	0.99976	0.00000
	0.00015	2.40358											
40.000	0.44719	1.86465	1.82343	1.49869	0.04750	0.00000	0.00259	0.00006	0.00005	0.00073	0.00002	0.99986	0.00000
	0.00010	2.31121											
30.000	0.43325	1.77953	2.00766	1.49860	0.06007	0.00000	0.00278	0.00003	0.00004	0.00125	0.00001	0.99994	0.00000
	0.00006	2.21156											
20.000	0.41090	1.67923	2.23065	1.49849	0.07942	0.00000	0.00301	0.00001	0.00002	0.00258	0.00000	1.00000	0.00000
	0.00003	2.08755											
10.000	0.37254	1.58393	2.45963	1.49847	0.11008	0.00000	0.00306	0.00000	0.00001	0.00640	0.00000	0.99998	0.00000
	0.00001	1.95006											
8.000	0.36109	1.56988	2.49916	1.49851	0.11853	0.00000	0.00299	0.00000	0.00001	0.00795	0.00000	1.00002	0.00000
	0.00001	1.92302											
6.000	0.34769	1.56289	2.52654	1.49857	0.12800	0.00000	0.00285	0.00000	0.00000	0.01001	0.00000	1.00003	0.00000
	0.00000	1.90056											
5.000	0.33998	1.56354	2.53296	1.49863	0.13326	0.00000	0.00275	0.00000	0.00000	0.01132	0.00000	1.00003	0.00000
	0.00000	1.89219											
4.000	0.33148	1.56946	2.52962	1.49870	0.13892	0.00000	0.00261	0.00000	0.00000	0.01285	0.00000	1.00005	0.00000
	0.00000	1.88808											
3.000	0.32203	1.58418	2.50964	1.49880	0.14505	0.00000	0.00241	0.00000	0.00000	0.01465	0.00000	1.00005	0.00000
	0.00000	1.89154											
2.000	0.31131	1.61528	2.45818	1.49894	0.15194	0.00000	0.00213	0.00000	0.00000	0.01678	0.00000	1.00005	0.00000
	0.00000	1.90978											
1.000	0.29885	1.68873	2.32374	1.49916	0.16019	0.00000	0.00169	0.00000	0.00000	0.01921	0.00000	1.00009	0.00000
	0.00000	1.96834											
0.800	0.29616	1.71644	2.27101	1.49923	0.16215	0.00000	0.00156	0.00000	0.00000	0.01967	0.00000	1.00006	0.00000
	0.00000	1.99290											
0.600	0.29348	1.75449	2.19759	1.49930	0.16431	0.00000	0.00140	0.00000	0.00000	0.02005	0.00000	1.00006	0.00000
	0.00000	2.02790											
0.500	0.29221	1.77991	2.14803	1.49935	0.16548	0.00000	0.00130	0.00000	0.00000	0.02016	0.00000	1.00006	0.00000
	0.00000	2.05193											
0.400	0.29111	1.81225	2.08444	1.49941	0.16674	0.00000	0.00119	0.00000	0.00000	0.02017	0.00000	1.00006	0.00000
	0.00000	2.08316											
0.300	0.29029	1.85604	1.99768	1.49947	0.16809	0.00000	0.00106	0.00000	0.00000	0.02001	0.00000	1.00008	0.00000
	0.00000	2.12630											
0.200	0.29013	1.92074	1.86845	1.49956	0.16955	0.00000	0.00090	0.00000	0.00000	0.01948	0.00000	1.00009	0.00000
	0.00000	2.19136											
0.100	0.29172	2.03645	1.63544	1.49968	0.17109	0.00000	0.00066	0.00000	0.00000	0.01809	0.00000	1.00008	0.00000
	0.00000	2.31007											
0.080	0.29244	2.07333	1.56097	1.49971	0.17148	0.00000	0.00060	0.00000	0.00000	0.01757	0.00000	1.00006	0.00000
	0.00000	2.34814											
0.060	0.29355	2.12106	1.46440	1.49975	0.17181	0.00000	0.00052	0.00000	0.00000	0.01691	0.00000	1.00008	0.00000

K-H-T ISENTROPE THRU C-J POINT



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	NM/CCL4 90/10 VOL %	#NM/CCL4 80/20	#NM/CCL4 70/30	#NM/CCL4 60/40	#NM/CCL4 50/50	#NM/CCL4 40/60	#NM/CHCL3 95/5	#
RHO (G/CC)	1.170	1.212	1.258	1.294	1.350	1.397	1.145	
EO (KCAL/MOLE)	-48.29	-46.62	-44.96	-43.30	-41.64	-39.98	-49.41	
MOL.WEIGHT (G)	117.364	121.928	126.492	131.056	135.620	140.184	114.550	
C	1.7662	1.6844	1.6026	1.5208	1.4390	1.3572	1.8175	
H	4.9895	4.4351	3.8807	3.3263	2.7719	2.2175	5.3286	
N	1.6632	1.4784	1.2936	1.1088	0.9240	0.7392	1.7556	
O	3.3263	2.9567	2.5871	2.2175	1.8480	1.4784	3.5111	
CL	0.4120	0.8240	1.2360	1.6480	2.0600	2.4720	0.1857	
DETN.VEL (M/SEC)	6109.4	5955.7	5811.4	5630.6	5498.7	5252.8	6179.5	
PARTICL.VEL(")	1605.7	1535.7	1509.7	1464.4	1333.4	1279.0	1635.6	
C-J PRESS (KBAR)	114.8	110.9	110.4	106.7	99.0	93.9	115.7	
C-J VOLUME (CC/G)	0.63007	0.61234	0.58842	0.57182	0.56111	0.54152	0.64221	
C-J TEMP (DEG K)	3176.1	3067.7	2966.9	2846.4	2643.8	2365.5	3213.8	
C-J S(CAL/DEG MOL)	53.79	53.12	52.30	51.23	49.69	48.42	54.03	
C-J ENERGY (CAL/G)	308.11	281.82	272.35	256.25	212.48	195.49	319.68	
GAMMA	2.805	2.878	2.849	2.845	3.124	3.107	2.778	
C-J DETN.HEAT(CAL)	1146.2	1012.8	891.2	776.2	670.8	546.1	1220.8	
LAMDA	8.3112	8.8770	9.4899	10.1460	10.8617	11.9082	7.9858	
VOLUM(K LITTRE/KG)	0.8841	0.8250	0.7689	0.7180	0.6694	0.6104	0.9192	
TOTAL PRODCT(MOLE)	5.2720	5.0363	4.7989	4.5586	4.3162	4.0716	5.4189	
V GAS (MOLES)	4.2410	4.1118	3.9756	3.8462	3.7107	3.4979	4.3039	
V GAS (CC/MOLE)	16.4244	17.2171	17.8560	18.7066	19.8157	21.0039	16.0155	
V SOL C(S) (CC/G)	0.34660	0.34836	0.34804	0.34958	0.35318	0.35474	0.34625	
H2O (MOL %)	40.8872	34.0621	26.4791	17.8437	8.0853	0.0381	44.4486	
CO2 (MOL %)	8.2731	9.5646	11.1920	13.0659	15.4171	17.0285	7.4000	
CO (MOL %)	5.6390	5.5022	5.0377	4.6644	3.8931	2.2142	5.5196	
N2 (MOL %)	15.5460	14.5253	13.3917	12.1214	10.6941	9.0772	15.9207	
H2 (MOL %)	1.7715	1.2877	0.7991	0.4437	0.1527	0.0004	2.0806	
O2 (MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	
NH3 (MOL %)	0.4492	0.2996	0.1691	0.0781	0.0184	0.0000	0.5489	
OH (MOL %)	0.0175	0.0115	0.0072	0.0038	0.0011	0.0000	0.0201	
H (MOL %)	0.0048	0.0030	0.0016	0.0008	0.0002	0.0000	0.0059	
CH4 (MOL %)	0.0345	0.0222	0.0106	0.0042	0.0007	0.0000	0.0432	
NO (MOL %)	0.0060	0.0041	0.0029	0.0018	0.0007	0.0002	0.0066	
HCL (MOL %)	7.8160	16.3609	25.7514	36.1380	47.6874	54.3877	3.4289	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	
CL2 (MOL %)	0.0002	0.0010	0.0029	0.0075	0.0206	3.1628	0.0000	
C(S) (MOL %)	19.5549	18.3559	17.1546	15.6266	14.0285	14.0906	20.5769	

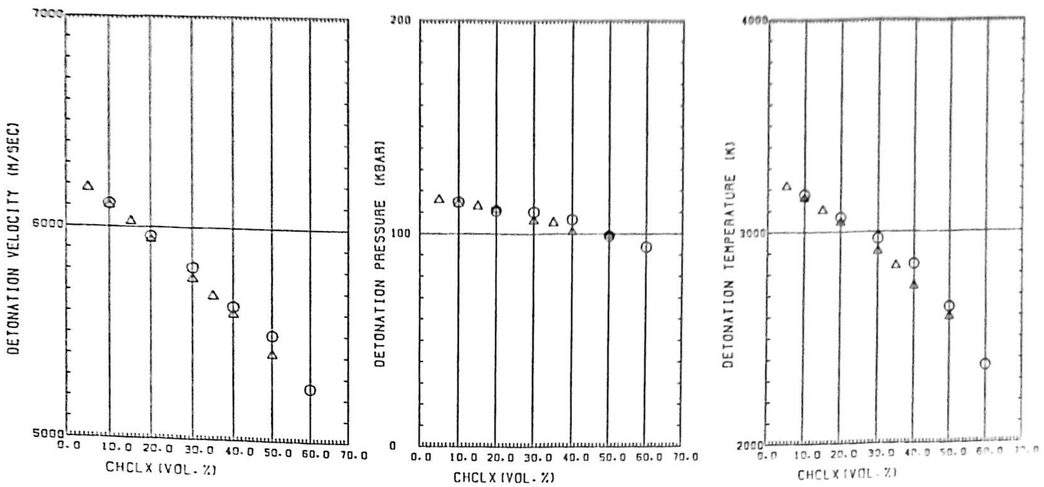
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	NM/CHCL3 90/10	#NM/CHCL3 85/15	#NM/CHCL3 80/20	#NM/CHCL3 70/30	#NM/CHCL3 65/35	#NM/CHCL3 60/40	#NM/CHCL3 50/50	#
RHO (G/CC)	1.163	1.182	1.199	1.230	1.250	1.269	1.301	
EO (KCAL/MOLE)	-48.86	-48.32	-47.78	-46.70	-46.15	-45.61	-44.53	
MOL.WEIGHT (G)	116.301	118.051	119.802	123.303	125.053	126.804	130.305	
C	1.7870	1.7565	1.7260	1.6650	1.6345	1.6040	1.5431	
H	5.1133	4.8980	4.6827	4.2521	4.0369	3.8216	3.3910	
N	1.6632	1.5708	1.4784	1.2936	1.2012	1.1088	0.9240	
O	3.3263	3.1415	2.9567	2.5871	2.4023	2.2175	1.8480	
CL	0.3714	0.5572	0.7429	1.1143	1.3001	1.4858	1.8572	
DETN.VEL (M/SEC)	6100.5	6023.8	5940.5	5759.8	5680.0	5595.8	5408.4	
PARTICL.VEL(")	1607.6	1585.7	1563.5	1497.3	1480.3	1420.2	1412.0	
C-J PRESS (KBAR)	114.1	112.9	111.4	106.1	105.1	100.9	99.4	
C-J VOLUME (CC/G)	0.63326	0.62332	0.61452	0.60166	0.59151	0.58802	0.56797	
C-J TEMP (DEG K)	3158.1	3101.9	3043.5	2906.3	2836.7	2741.1	2596.5	
C-J S(CAL/DEG MOL)	53.83	53.58	53.27	52.48	52.03	51.46	50.32	
C-J ENERGY (CAL/G)	308.86	300.47	292.12	267.93	261.86	241.03	238.26	
GAMMA	2.795	2.799	2.800	2.847	2.837	2.940	2.830	
C-J DETN.HEAT(CAL)	1153.8	1089.1	1025.8	903.7	846.4	789.6	681.3	
LAMDA	8.1953	8.4128	8.6378	9.1114	9.3643	9.6244	10.1786	
VOLUM(K LITTRE/KG)	0.8911	0.8636	0.8372	0.7873	0.7626	0.7394	0.6942	
TOTAL PRODCT(MOLE)	5.3323	5.2457	5.1584	4.9824	4.8943	4.8053	4.6264	
V GAS (MOLES)	4.2361	4.1670	4.0996	3.9680	3.8981	3.8322	3.6975	
V GAS (CC/MOLE)	16.3076	16.5791	16.8790	17.6203	17.9001	18.3816	18.9521	
V SOL C(S) (CC/G)	0.34693	0.34730	0.34789	0.35033	0.35052	0.35260	0.35265	
H2O (MOL %)	41.8171	39.0999	36.2436	30.1132	26.8926	23.4697	16.1735	
CO2 (MOL %)	7.6242	7.8797	8.1522	8.7623	9.1551	9.5528	10.4976	
CO (MOL %)	5.2932	5.0118	4.7573	4.2809	3.8770	3.5699	2.7744	
N2 (MOL %)	15.3541	14.7677	14.1584	12.8672	12.1847	11.4725	9.9575	
H2 (MOL %)	1.8460	1.5994	1.3796	1.0007	0.7856	0.6264	0.3164	
O2 (MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.4765	0.4042	0.3390	0.2263	0.1714	0.1278	0.0564	
OH (MOL %)	0.0165	0.0133	0.0105	0.0059	0.0043	0.0028	0.0012	
H (MOL %)	0.0047	0.0037	0.0028	0.0016	0.0011	0.0007	0.0003	
CH4 (MOL %)	0.0371	0.0305	0.0250	0.0163	0.0114	0.0084	0.0029	
NO (MOL %)	0.0054	0.0044	0.0036	0.0020	0.0015	0.0010	0.0005	
HCL (MOL %)	6.9671	10.6222	14.4017	22.3637	26.5599	30.9153	40.1348	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0001	0.0003	0.0006	0.0015	0.0021	0.0027	0.0053	
C(S) (MOL %)	20.5580	20.5628	20.5258	20.3585	20.3535	20.2501	20.0793	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



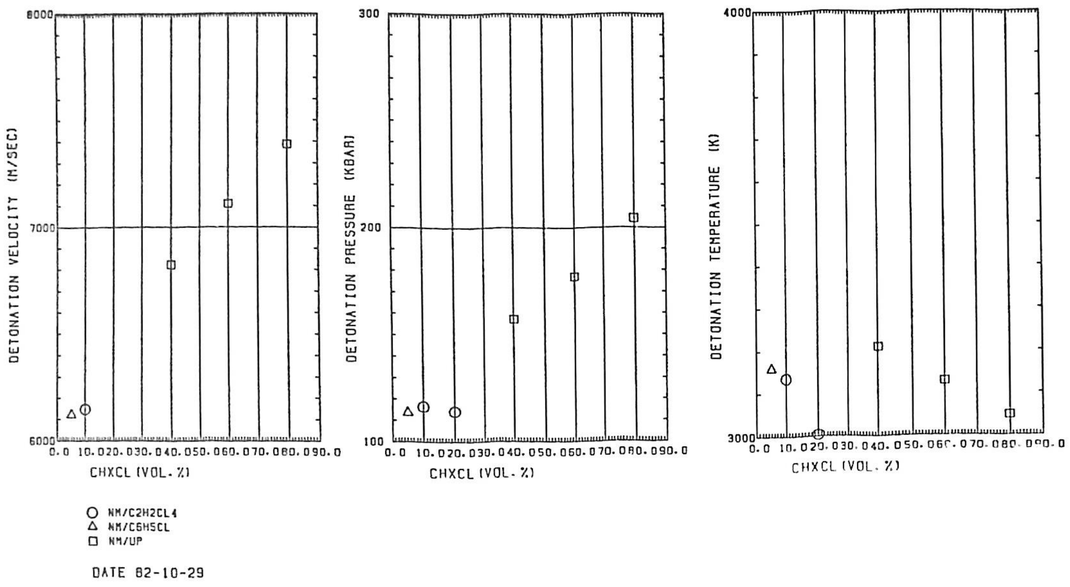
DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	NM/C2H2CL4 90/10	#NM/C2H2CL4 80/20	#NM/C6H5CL 95/5	#NM/UP 60/40	#NM/UP VOL.% 40/60	#NM/UP VOL.% 20/80	# VOL.%
RHO (G/CC)	1.184	1.229	1.137	1.300	1.390	1.480	
EO (KCAL/MOLE)	-48.50	-47.05	-49.48	-53.16	-54.76	-56.37	
MOL.WEIGHT (G)	117.400	122.000	112.665	114.880	115.920	116.960	
C	1.8524	1.8568	2.0490	1.3379	1.0829	0.8279	
H	5.1787	4.8135	5.5112	4.9161	4.6022	4.2883	
N	1.6632	1.4784	1.7556	2.0253	2.1140	2.2027	
O	3.3263	2.9567	3.5111	3.5853	3.5300	3.4747	
CL	0.3784	0.7569	0.0489	0.2291	0.3437	0.4583	
DETN.VEL (M/SEC)	6147.4	5997.4	6121.3	6821.6	7108.7	7386.0	
PARTICL.VEL(")	1599.0	1547.8	1632.5	1771.2	1791.2	1869.2	
C-J PRESS (KBAR)	116.4	114.1	113.6	157.1	177.0	204.3	
C-J VOLUME (CC/G)	0.62491	0.60368	0.64496	0.56950	0.53815	0.50468	
C-J TEMP (DEG K)	3135.4	3003.4	3158.9	3209.3	3127.6	3047.3	
C-J S(CAL/DEG MOL)	53.97	53.52	54.61	52.69	51.58	50.36	
C-J ENERGY (CAL/G)	305.53	286.29	318.47	374.91	383.40	417.54	
GAMMA	2.845	2.875	2.750	2.851	2.969	2.951	
C-J DETN.HEAT(CAL)	1155.2	1027.3	1235.0	1233.7	1200.4	1165.0	
LAMDA	8.1711	8.5832	7.7210	8.3880	8.7002	9.0127	
VOLUM(K LITTRE/KG)	0.8840	0.8268	0.9189	0.9167	0.9060	0.8973	
TOTAL PRODCT(MOLE)	5.4354	5.3626	5.6691	4.9110	4.6063	4.2995	
V GAS (MOLES)	4.2421	4.1230	4.2319	4.3048	4.2929	4.2897	
V GAS (CC/MOLE)	16.1277	16.6138	15.7544	14.6524	14.2580	13.7521	
V SOL C(S) (CC/G)	0.34538	0.34598	0.34721	0.32270	0.31194	0.29815	
H2O (MOL %)	41.7236	36.0926	45.0485	46.5759	45.5976	44.2335	
CO2 (MOL %)	7.3602	7.5433	6.1191	11.5001	14.3008	17.5268	
CO (MOL %)	4.7340	3.9455	4.6263	3.3949	2.4029	1.5001	
N2 (MOL %)	15.0724	13.6257	15.1877	20.4847	22.8617	25.5650	
H2 (MOL %)	1.6871	1.2145	2.1423	0.7319	0.3791	0.1695	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0002	0.0002	0.0003	
NH3 (MOL %)	0.4489	0.3136	0.5867	0.2588	0.1568	0.0868	
OH (MOL %)	0.0151	0.0089	0.0164	0.0213	0.0166	0.0125	
H (MOL %)	0.0041	0.0023	0.0051	0.0026	0.0012	0.0005	
CH4 (MOL %)	0.0316	0.0202	0.0467	0.0053	0.0016	0.0004	
NO (MOL %)	0.0050	0.0031	0.0050	0.0132	0.0142	0.0159	
HCL (MOL %)	6.9635	14.1139	0.8646	4.6675	7.4631	10.6599	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0001	0.0005	0.0000	0.0001	0.0002	0.0005	
C(S) (MOL %)	21.9544	23.1161	25.3516	12.3436	6.8040	0.2285	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM/CHCL3 1/0.02 278 K	#NM/CHCL3 1/0.02 288 K	#NM/CHCL3 1/0.02 298 K	#NM/CHCL3 1/0.02 313 K	#NM/CHCL3 1/0.05 278 K	#NM/CHCL3 1/0.05 288 K	#NM/CHCL3 1/0.05 298 K	#
RHO (G/CC)	1.162	1.148	1.134	1.113	1.178	1.164	1.150	
EO (KCAL/MOLE)	-28.18	-27.92	-27.66	-27.40	-29.15	-28.85	-28.61	
MOL.WEIGHT (G)	63.428	63.428	63.428	63.428	67.009	67.009	67.009	
C	1.0200	1.0200	1.0200	1.0200	1.0500	1.0500	1.0500	
H	3.0200	3.0200	3.0200	3.0200	3.0500	3.0500	3.0500	
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	
CL	0.0600	0.0600	0.0600	0.0600	0.1500	0.1500	0.1500	
DETN.VEL (M/SEC)	6284.9	6243.3	6201.3	6137.2	6224.6	6184.3	6142.5	
PARTICL.VEL(")	1672.6	1681.3	1646.3	1655.6	1643.0	1617.6	1624.6	
C-J PRESS (KBAR)	122.1	120.5	115.8	113.1	120.5	116.4	114.8	
C-J VOLUME (CC/G)	0.63156	0.63651	0.64773	0.65610	0.62483	0.63440	0.63958	
C-J TEMP (DEG K)	3224.1	3242.1	3237.3	3257.6	3174.9	3177.0	3193.4	
C-J S(CAL/DEG MOL)	54.14	54.15	54.08	54.07	53.99	53.95	53.96	
C-J ENERGY (CAL/G)	334.31	337.79	323.87	327.56	322.58	312.71	315.43	
GAMMA	2.758	2.713	2.767	2.707	2.789	2.823	2.781	
C-J DETN.HEAT(CAL)	1249.8	1250.2	1248.7	1246.7	1194.5	1194.2	1194.0	
LAMDA	7.9024	7.9011	7.8996	7.8978	8.0705	8.0682	8.0662	
VOLUM(K LITTRE/KG)	0.9257	0.9282	0.9319	0.9359	0.9029	0.9061	0.9085	
TOTAL PRODCT(MOLE)	3.0428	3.0417	3.0399	3.0380	3.1341	3.1326	3.1315	
V GAS (MOLES)	2.4001	2.4064	2.4161	2.4265	2.4730	2.4817	2.4884	
V GAS (CC/MOLE)	15.5894	15.6880	15.9306	16.0964	15.8290	16.0409	16.1466	
V SOL C(S) (CC/G)	0.34243	0.34353	0.34636	0.34813	0.34315	0.34559	0.34671	
H2O (MOL %)	45.9166	45.7477	45.4770	45.1906	43.8063	43.5816	43.4126	
CO2 (MOL %)	7.4190	7.3654	7.3002	7.2209	7.6068	7.5366	7.4776	
CO (MOL %)	4.9476	5.2454	5.6857	6.1698	4.7719	5.1670	5.4762	
N2 (MOL %)	16.1697	16.1617	16.1512	16.1395	15.7187	15.7096	15.7018	
H2 (MOL %)	1.8631	1.9974	2.2177	2.4477	1.6914	1.8728	2.0082	
O2 (MOL %)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
NH3 (MOL %)	0.5189	0.5467	0.5871	0.6308	0.4636	0.4977	0.5240	
OH (MOL %)	0.0210	0.0221	0.0219	0.0232	0.0177	0.0178	0.0187	
H (MOL %)	0.0055	0.0061	0.0066	0.0075	0.0045	0.0050	0.0055	
CH4 (MOL %)	0.0336	0.0383	0.0474	0.0572	0.0298	0.0365	0.0416	
NO (MOL %)	0.0073	0.0076	0.0071	0.0072	0.0062	0.0059	0.0061	
HCL (MOL %)	1.9750	1.9757	1.9769	1.9780	4.7886	4.7908	4.7925	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	
C(S) (MOL %)	21.1228	20.8858	20.5213	20.1274	21.0945	20.7784	20.5352	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM/CHCL3 1/0.05 313 K	#NM/CHCL3 1/0.1 278 K	#NM/CHCL3 1/0.1 288 K	#NM/CHCL3 1/0.1 298 K	#NM/CHCL3 1/0.1 313 K	#NM/CHCL3 1/0.15 278 K	#NM/CHCL3 1/0.15 288 K	#
RHO (G/CC)	1.129	1.200	1.185	1.170	1.148	1.218	1.204	
EO (KCAL/MOLE)	-28.24	-30.76	-30.48	-30.19	-29.76	-31.77	-32.07	
MOL.WEIGHT (G)	67.009	72.978	72.978	72.978	72.978	78.947	78.947	
C	1.0500	1.1000	1.1000	1.1000	1.1000	1.1500	1.1500	
H	3.0500	3.1000	3.1000	3.1000	3.1000	3.1500	3.1500	
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	
CL	0.1500	0.3000	0.3000	0.3000	0.3000	0.4500	0.4500	
DETN.VEL (M/SEC)	6080.8	6128.4	6084.1	6040.8	5976.5	6048.8	5999.1	
PARTICL.VEL(")	1626.4	1581.6	1590.0	1595.8	1585.5	1589.7	1553.4	
C-J PRESS (KBAR)	111.7	116.3	114.6	112.8	108.7	117.1	112.2	
C-J VOLUME (CC/G)	0.64884	0.61827	0.62335	0.62891	0.64028	0.60525	0.61551	
C-J TEMP (DEG K)	3212.9	3090.4	3109.7	3127.7	3143.8	3059.4	3041.5	
C-J S(CAL/DEG MOL)	53.95	53.64	53.67	53.69	53.66	53.42	53.33	
C-J ENERGY (CAL/G)	316.09	298.94	302.10	304.34	300.39	302.01	288.36	
GAMMA	2.739	2.875	2.827	2.785	2.770	2.805	2.862	
C-J DETN.HEAT(CAL)	1193.3	1113.4	1113.7	1114.0	1113.2	1052.8	1045.6	
LAMDA	8.0632	8.3298	8.3268	8.3236	8.3182	8.5665	8.5627	
VOLUM(K LITTRE/KG)	0.9126	0.8705	0.8727	0.8752	0.8796	0.8425	0.8447	
TOTAL PRODCT(MOLE)	3.1296	3.2859	3.2849	3.2838	3.2818	3.4377	3.4367	
V GAS (MOLES)	2.4997	2.5965	2.6033	2.6107	2.6238	2.7187	2.7258	
V GAS (CC/MOLE)	16.3379	16.2767	16.3856	16.5043	16.7542	16.4816	16.7387	
V SOL C(S) (CC/G)	0.34875	0.34515	0.34629	0.34753	0.35014	0.34448	0.34737	
H2O (MOL %)	43.1232	40.4790	40.3291	40.1650	39.8618	37.4722	37.3184	
CO2 (MOL %)	7.3846	7.8992	7.8290	7.7567	7.6368	8.1774	8.1107	
CO (MOL %)	5.9890	4.5735	4.8804	5.2097	5.7891	4.3380	4.6426	
N2 (MOL %)	15.6901	15.0193	15.0120	15.0047	14.9926	14.3794	14.3735	
H2 (MOL %)	2.2408	1.4804	1.6001	1.7314	1.9761	1.2593	1.3854	
O2 (MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.5671	0.3911	0.4143	0.4389	0.4818	0.3269	0.3476	
OH (MOL %)	0.0198	0.0130	0.0138	0.0146	0.0154	0.0112	0.0106	
H (MOL %)	0.0063	0.0033	0.0037	0.0042	0.0049	0.0027	0.0028	
CH4 (MOL %)	0.0513	0.0258	0.0297	0.0344	0.0443	0.0203	0.0248	
NO (MOL %)	0.0062	0.0045	0.0047	0.0048	0.0048	0.0040	0.0036	
HCL (MOL %)	4.7954	9.1318	9.1345	9.1376	9.1432	13.0910	13.0949	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0001	0.0002	0.0002	0.0002	0.0003	0.0005	0.0005	
C(S) (MOL %)	20.1262	20.9788	20.7484	20.4977	20.0491	20.9171	20.6847	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM/CHCL3 1/0.15 298 K	#NM/CHCL3 1/0.15 313 K	#NM/CHCL3 1/0.2 278 K	#NM/CHCL3 1/0.2 288 K	#NM/CHCL3 1/0.2 298 K	#NM/CHCL3 1/0.2 313 K	#NM/CHCL3 1/0.3 278 K	#
RHO (G/CC)	1.190	1.169	1.236	1.222	1.208	1.187	1.272	
EO (KCAL/MOLE)	-31.77	-31.32	-33.97	-33.66	-33.35	-32.88	-37.17	
MOL.WEIGHT (G)	78.947	78.947	84.916	84.916	84.916	84.916	96.854	
C	1.1500	1.1500	1.2000	1.2000	1.2000	1.2000	1.3000	
H	3.1500	3.1500	3.2000	3.2000	3.2000	3.2000	3.3000	
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	
CL	0.4500	0.4500	0.6000	0.6000	0.6000	0.6000	0.9000	
DETN.VEL (M/SEC)	5958.5	5899.4	5964.4	5924.4	5885.4	5826.5	5852.9	
PARTICL.VEL(")	1568.6	1556.2	1528.7	1546.1	1498.2	1518.5	1504.2	
C-J PRESS (KBAR)	111.2	107.3	112.7	111.9	106.5	105.0	112.0	
C-J VOLUME (CC/G)	0.61912	0.62978	0.60170	0.60477	0.61709	0.62290	0.58412	
C-J TEMP (DEG K)	3064.2	3079.4	2964.8	2989.6	2980.6	3013.4	2858.3	
C-J S(CAL/DEG MOL)	53.38	53.37	52.98	53.03	52.97	53.03	52.32	
C-J ENERGY (CAL/G)	294.01	289.42	279.26	285.68	268.23	275.54	270.39	
GAMMA	2.799	2.791	2.902	2.832	2.928	2.837	2.891	
C-J DETN.HEAT(CAL)	1046.6	1046.4	987.0	988.1	987.4	988.4	893.3	
LAMDA	8.5593	8.5528	8.7843	8.7805	8.7743	8.7677	9.1723	
VOLUM(K LITTRE/KG)	0.8466	0.8504	0.8183	0.8199	0.8228	0.8258	0.7781	
TOTAL PRODCT(MOLE)	3.4359	3.4342	3.5893	3.5887	3.5874	3.5862	3.8924	
V GAS (MOLES)	2.7319	2.7442	2.8402	2.8459	2.8560	2.8661	3.0802	
V GAS (CC/MOLE)	16.8141	17.0589	16.8915	16.9567	17.2695	17.3939	17.2700	
V SOL C(S) (CC/G)	0.34811	0.35062	0.34660	0.34721	0.35052	0.35167	0.34639	
H2O (MOL %)	37.2010	36.9475	34.6874	34.5926	34.4016	34.2233	29.7830	
CO2 (MOL %)	8.0421	7.9166	8.4782	8.4071	8.3022	8.1828	9.0708	
CO (MOL %)	4.9110	5.4430	4.0681	4.3145	4.7366	5.1712	3.4534	
N2 (MOL %)	14.3678	14.3577	13.7934	13.7886	13.7814	13.7738	12.7542	
H2 (MOL %)	1.4789	1.6837	1.0848	1.1602	1.3162	1.4593	0.7518	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.3651	0.3998	0.2716	0.2858	0.3104	0.3351	0.1818	
OH (MOL %)	0.0114	0.0121	0.0078	0.0085	0.0083	0.0093	0.0049	
H (MOL %)	0.0032	0.0037	0.0019	0.0021	0.0023	0.0028	0.0011	
CH4 (MOL %)	0.0277	0.0355	0.0170	0.0190	0.0245	0.0294	0.0098	
NO (MOL %)	0.0038	0.0038	0.0028	0.0030	0.0027	0.0030	0.0018	
HCL (MOL %)	13.0979	13.1044	16.7165	16.7194	16.7254	16.7309	23.1210	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0005	0.0005	0.0008	0.0008	0.0008	0.0008	0.0015	
C(S) (MOL %)	20.4896	20.0918	20.8696	20.6983	20.3874	20.0785	20.8649	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM/CHCL3 1/0.3 288 K	#NM/CHCL3 1/0.3 298 K	#NM/CHCL3 1/0.3 313 K	#NM/CHCL3 1/0.35 278 K	#NM/CHCL3 1/0.35 288 K	#NM/CHCL3 1/0.35 298 K	#NM/CHCL3 1/0.35 313 K #
RHO (G/CC)	1.256	1.240	1.216	1.282	1.267	1.252	1.229
EO (KCAL/MOLE)	-36.83	-36.50	-36.00	-38.77	-38.42	-38.08	-37.57
MOL.WEIGHT (G)	96.854	96.854	96.854	102.823	102.823	102.823	102.823
C	1.3000	1.3000	1.3000	1.3500	1.3500	1.3500	1.3500
H	3.3000	3.3000	3.3000	3.3500	3.3500	3.3500	3.3500
N	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
CL	0.9000	0.9000	0.9000	1.0500	1.0500	1.0500	1.0500
DETN.VEL (M/SEC)	5808.0	5763.2	5697.0	5789.2	5746.1	5704.9	5644.8
PARTICL.VEL(")	1465.6	1471.9	1461.8	1424.0	1453.2	1453.3	1464.3
C-J PRESS (KBAR)	106.9	105.2	101.3	105.7	105.8	103.8	.101.6
C-J VOLUME (CC/G)	0.59528	0.60050	0.61136	0.58816	0.58965	0.59525	0.60235
C-J TEMP (DEG K)	2857.1	2878.0	2898.7	2778.4	2810.8	2828.3	2859.8
C-J S(CAL/DEG MOL)	52.31	52.36	52.39	51.90	52.00	52.04	52.12
C-J ENERGY (CAL/G)	256.67	258.88	255.35	242.33	252.38	252.40	256.25
GAMMA	2.963	2.916	2.897	3.065	2.954	2.925	2.855
C-J DETN.HEAT(CAL)	893.1	893.6	893.6	852.4	853.8	854.3	855.2
LAMDA	9.1649	9.1589	9.1486	9.3404	9.3356	9.3294	9.3198
VOLUM(K LITTRE/KG)	0.7804	0.7823	0.7856	0.7629	0.7642	0.7659	0.7685
TOTAL PRODCT(MOLE)	3.8914	3.8908	3.8895	4.0430	4.0426	4.0420	4.0411
V GAS (MOLES)	3.0896	3.0970	3.1102	3.2062	3.2116	3.2189	3.2301
V GAS (CC/MOLE)	17.5718	17.7000	17.9750	17.7657	17.7908	17.9355	18.1105
V SOL C(S) (CC/G)	0.34951	0.35072	0.35333	0.34979	0.34992	0.35128	0.35285
H2O (MOL %)	29.6481	29.5455	29.3541	27.4930	27.4329	27.3428	27.2043
CO2 (MOL %)	8.9546	8.8573	8.6921	9.2867	9.2074	9.1094	8.9587
CO (MOL %)	3.8327	4.1391	4.6764	3.3990	3.6217	3.9155	4.3655
N2 (MOL %)	12.7484	12.7439	12.7363	12.2874	12.2842	12.2804	12.2746
H2 (MOL %)	0.8623	0.9451	1.1008	0.6943	0.7425	0.8158	0.9285
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.1991	0.2126	0.2363	0.1582	0.1666	0.1780	0.1953
OH (MOL %)	0.0049	0.0053	0.0057	0.0035	0.0039	0.0042	0.0048
H (MOL %)	0.0012	0.0014	0.0017	0.0008	0.0009	0.0011	0.0013
CH4 (MOL %)	0.0128	0.0151	0.0199	0.0093	0.0103	0.0122	0.0153
NO (MOL %)	0.0017	0.0018	0.0019	0.0013	0.0014	0.0015	0.0016
HCL (MOL %)	23.1260	23.1301	23.1379	25.9685	25.9709	25.9747	25.9804
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOL %)	0.0015	0.0015	0.0015	0.0018	0.0019	0.0019	0.0020
C(S) (MOL %)	20.6067	20.4013	20.0353	20.6964	20.5553	20.3626	20.0679

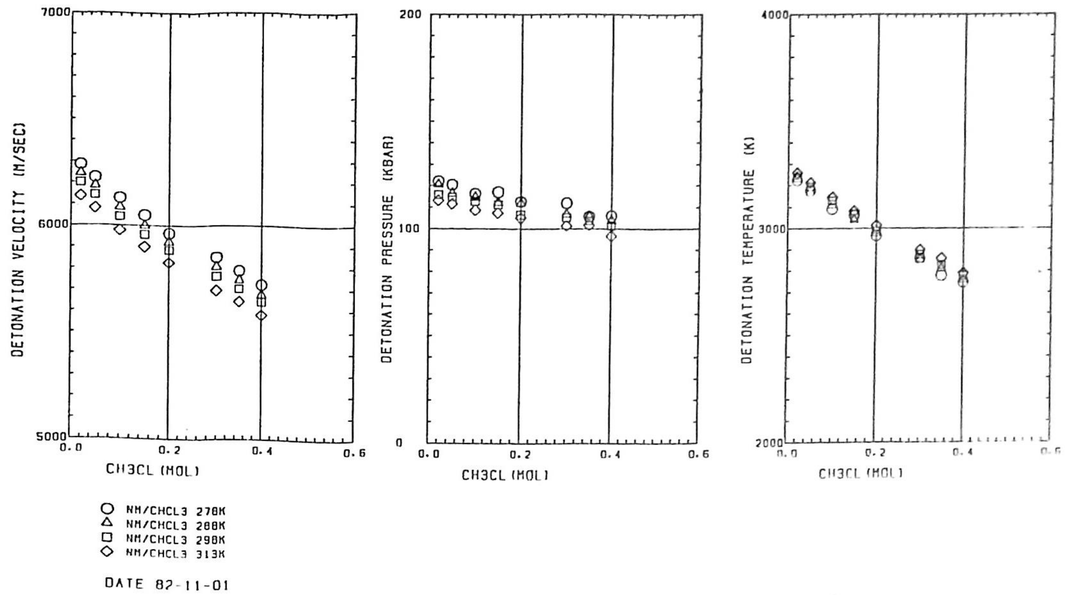
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	NM/CHCL3 1/0.4 278 K	#NM/CHCL3 1/0.4 288 K	#NM/CHCL3 1/0.4 298 K	#NM/CHCL3 1/0.4 313 K #
RHO (G/CC)	1.290	1.275	1.260	1.238
EO (KCAL/MOLE)	-40.35	-40.41	-39.66	-39.15
MOL.WEIGHT (G)	108.792	108.792	108.792	108.792
C	1.4000	1.4000	1.4000	1.4000
H	3.4000	3.4000	3.4000	3.4000
N	1.0000	1.0000	1.0000	1.0000
O	2.0000	2.0000	2.0000	2.0000
CL	1.2000	1.2000	1.2000	1.2000
DETN.VEL (M/SEC)	5724.2	5677.2	5642.7	5582.4
PARTICL.VEL(")	1435.3	1436.5	1426.3	1398.6
C-J PRESS (KBAR)	106.0	104.0	101.4	96.6
C-J VOLUME (CC/G)	0.58082	0.58586	0.59304	0.60562
C-J TEMP (DEG K)	2746.9	2756.8	2778.0	2789.3
C-J S(CAL/DEG MOL)	51.64	51.67	51.73	51.74
C-J ENERGY (CAL/G)	246.17	246.60	243.11	233.77
GAMMA	2.988	2.952	2.956	2.991
C-J DETN.HEAT(CAL)	817.7	815.1	818.8	818.8
LAMDA	9.4994	9.4945	9.4862	9.4744
VOLUM(K LITTRE/KG)	0.7484	0.7496	0.7517	0.7547
TOTAL PRODCT(MOLE)	4.1940	4.1936	4.1929	4.1919
V GAS (MOLES)	3.3280	3.3335	3.3427	3.3561
V GAS (CC/MOLE)	17.8949	18.0332	18.2245	18.5683
V SOL C(S) (CC/G)	0.34941	0.35072	0.35248	0.35561
H2O (MOL %)	25.4256	25.3650	25.2639	25.1062
CO2 (MOL %)	9.5331	9.4572	9.3308	9.1549
CO (MOL %)	3.1928	3.4092	3.7707	4.2916
N2 (MOL %)	11.8554	11.8528	11.8485	11.8427
H2 (MOL %)	0.5903	0.6398	0.7225	0.8525
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000
NH3 (MOL %)	0.1316	0.1391	0.1514	0.1691
OH (MOL %)	0.0029	0.0030	0.0033	0.0035
H (MOL %)	0.0006	0.0007	0.0008	0.0010
CH4 (MOL %)	0.0072	0.0084	0.0104	0.0141
NO (MOL %)	0.0011	0.0011	0.0012	0.0011
HCL (MOL %)	28.6090	28.6117	28.6161	28.6233
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000
CL2 (MOL %)	0.0022	0.0022	0.0023	0.0023
C(S) (MOL %)	20.6481	20.5097	20.2780	19.9376

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	MN/CCL4 90/10	#MN/CCL4 80/20	#MN/CCL4 70/30	#MN/CCL4 60/40	#MN/CCL4 50/50	#MN/CHCL3 95/5	#MN/CHCL3 90/10	#
RHO (G/CC)	1.254	1.290	1.327	1.364	1.401	1.230	1.243	
EO (KCAL/MOLE)	-56.22	-53.68	-51.13	-48.59	-46.05	-57.78	-56.80	
MOL.WEIGHT (G)	125.374	129.048	132.722	136.396	140.070	123.005	124.311	
C	1.5247	1.4698	1.4148	1.3598	1.3049	1.5626	1.5455	
H	4.2652	3.7913	3.3174	2.8435	2.3695	4.5641	4.3890	
N	1.4217	1.2638	1.1058	0.9478	0.7898	1.5007	1.4217	
O	4.2652	3.7913	3.3174	2.8435	2.3695	4.5021	4.2652	
CL	0.4120	0.8240	1.2360	1.6480	2.0600	0.1857	0.3714	
DETN.VEL (M/SEC)	6672.9	6477.8	6278.4	6070.2	5849.3	6755.2	6653.5	
PARTICL.VEL(")	1769.2	1684.6	1680.9	1545.1	1462.1	1837.1	1742.0	
C-J PRESS (KBAR)	148.0	140.8	140.0	127.9	119.8	152.6	144.1	
C-J VOLUME (CC/G)	0.58601	0.57360	0.55183	0.54653	0.53537	0.59191	0.59387	
C-J TEMP (DEG K)	3679.8	3539.1	3431.6	3222.2	3019.2	3750.5	3644.6	
C-J S(CAL/DEG MOL)	53.94	53.28	52.57	51.39	50.00	54.26	53.95	
C-J ENERGY (CAL/G)	374.07	339.14	337.63	285.29	255.45	403.32	362.64	
GAMMA	2.772	2.845	2.735	2.929	3.001	2.677	2.819	
C-J DETN.HEAT(CAL)	1293.5	1147.6	1013.2	882.4	759.9	1375.1	1299.8	
LAMDA	9.1773	9.6506	10.1740	10.7298	11.3529	8.9010	9.0632	
VOLUM(K LITTRE/KG)	0.8804	0.8255	0.7712	0.7221	0.6736	0.9118	0.8883	
TOTAL PRODCT(MOLE)	4.5631	4.4019	4.2407	4.0780	3.9145	4.6745	4.6240	
V GAS (MOLES)	4.5116	4.3541	4.1836	4.0256	3.8568	4.5845	4.5137	
V GAS (CC/MOLE)	16.2396	16.9563	17.4520	18.4645	19.3817	15.8041	16.2582	
V SOL C(S) (CC/G)	0.33014	0.33344	0.33325	0.33901	0.34262	0.32799	0.33217	
H2O (MOL %)	40.4118	32.3859	23.7533	14.2727	4.0102	44.7647	41.5028	
CO2 (MOL %)	20.6649	21.3695	22.4112	23.3715	24.6543	19.9128	19.6034	
CO (MOL %)	11.6079	10.9246	9.5987	8.6869	7.2050	11.5718	11.4193	
N2 (MOL %)	15.4175	14.2458	12.9747	11.5937	10.0835	15.8603	15.2050	
H2 (MOL %)	1.3114	0.9862	0.6122	0.3374	0.0782	1.4744	1.4101	
O2 (MOL %)	0.0012	0.0007	0.0005	0.0002	0.0001	0.0015	0.0010	
NH3 (MOL %)	0.2811	0.1907	0.1064	0.0449	0.0056	0.3333	0.3006	
OH (MOL %)	0.0790	0.0502	0.0320	0.0138	0.0038	0.0972	0.0735	
H (MOL %)	0.0122	0.0078	0.0045	0.0020	0.0005	0.0149	0.0121	
CH4 (MOL %)	0.0157	0.0106	0.0049	0.0019	0.0001	0.0181	0.0180	
NO (MOL %)	0.0413	0.0271	0.0198	0.0096	0.0045	0.0503	0.0362	
HCL (MOL %)	9.0286	18.7117	29.1206	40.3480	52.3336	3.9744	8.0332	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0009	0.0044	0.0134	0.0324	0.1460	0.0002	0.0007	
C(S) (MOL %)	1.1265	1.0849	1.3478	1.2851	1.4744	1.9263	2.3843	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	MN/CHCL3 85/15	#MN/CHCL3 80/20	#MN/CHCL3 75/25	#MN/CHCL3 70/30	#ANNA/CCL4 90/10	#ANNA/CCL4 80/20	#ANNA/CCL4 70/30	#
RHO (G/CC)	1.256	1.269	1.282	1.295	1.285	1.318	1.352	
EO (KCAL/MOLE)	-55.81	-54.83	-53.85	-52.87	-52.77	-50.61	-48.45	
MOL.WEIGHT (G)	125.616	126.922	128.227	129.533	128.524	131.848	135.172	
C	1.5285	1.5114	1.4943	1.4772	1.3572	1.3209	1.2845	
H	4.2140	4.0389	3.8639	3.6888	3.2610	2.8986	2.5363	
N	1.3427	1.2638	1.1848	1.1058	2.0068	1.7838	1.5608	
O	4.0282	3.7913	3.5543	3.3174	4.1389	3.6790	3.2192	
CL	0.5572	0.7429	0.9286	1.1143	0.4120	0.8240	1.2360	
DETN.VEL (M/SEC)	6545.9	6438.0	6329.2	6219.0	6482.6	6315.5	6147.3	
PARTICL.VEL(")	1735.4	1700.7	1653.7	1636.4	1647.7	1632.4	1577.5	
C-J PRESS (KBAR)	142.7	138.9	134.2	131.8	137.3	135.9	131.1	
C-J VOLUME (CC/G)	0.58511	0.57985	0.57623	0.56901	0.58041	0.56262	0.54985	
C-J TEMP (DEG K)	3587.2	3509.7	3420.8	3345.3	3749.7	3638.7	3487.5	
C-J S(CAL/DEG MOL)	53.77	53.49	53.14	52.80	55.24	54.50	53.50	
C-J ENERGY (CAL/G)	359.89	345.67	326.81	320.00	324.45	318.44	297.36	
GAMMA	2.772	2.785	2.827	2.800	2.934	2.869	2.897	
C-J DETN.HEAT(CAL)	1230.1	1160.7	1092.4	1026.5	1250.1	1117.9	991.1	
LAMDA	9.2397	9.4210	9.6085	9.8069	9.9425	10.4045	10.9059	
VOLUM(K LITTRE/KG)	0.8625	0.8379	0.8139	0.7898	0.8057	0.7608	0.7179	
TOTAL PRODCT(MOLE)	4.5747	4.5250	4.4752	4.4256	4.2326	4.1000	3.9665	
V GAS (MOLES)	4.4284	4.3467	4.2661	4.1815	4.2326	4.1000	3.9665	
V GAS (CC/MOLE)	16.4652	16.7667	17.1218	17.3901	17.6244	18.0925	18.7381	
V SOL C(S) (CC/G)	0.33263	0.33430	0.33653	0.33748	0.33664	0.33680	0.33869	
H2O (MOL %)	38.2810	34.9495	31.5255	28.0407	33.4080	25.2439	16.6651	
CO2 (MOL %)	19.4809	19.3151	19.1359	19.0201	30.6306	31.0030	31.3338	
CO (MOL %)	10.7196	10.1327	9.5708	8.8364	1.4359	1.2133	1.0508	
N2 (MOL %)	14.5321	13.8432	13.1374	12.4136	23.3012	21.4407	19.4737	
H2 (MOL %)	1.2367	1.0924	0.9581	0.8014	0.0959	0.0611	0.0353	
O2 (MOL %)	0.0008	0.0006	0.0004	0.0003	0.2762	0.2129	0.1259	
NH3 (MOL %)	0.2572	0.2182	0.1817	0.1453	0.0059	0.0033	0.0016	
OH (MOL %)	0.0609	0.0476	0.0357	0.0271	0.3259	0.2212	0.1231	
H (MOL %)	0.0098	0.0077	0.0059	0.0044	0.0040	0.0024	0.0013	
CH4 (MOL %)	0.0149	0.0127	0.0107	0.0083	0.0000	0.0000	0.0000	
NO (MOL %)	0.0304	0.0237	0.0176	0.0136	0.8039	0.6217	0.4011	
HCL (MOL %)	12.1777	16.4131	20.7423	25.1673	9.6895	19.8548	30.4143	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.0016	0.0028	0.0044	0.0066	0.0229	0.1219	0.3740	
C(S) (MOL %)	3.1965	3.9406	4.6737	5.5149	0.0	0.0	0.0	

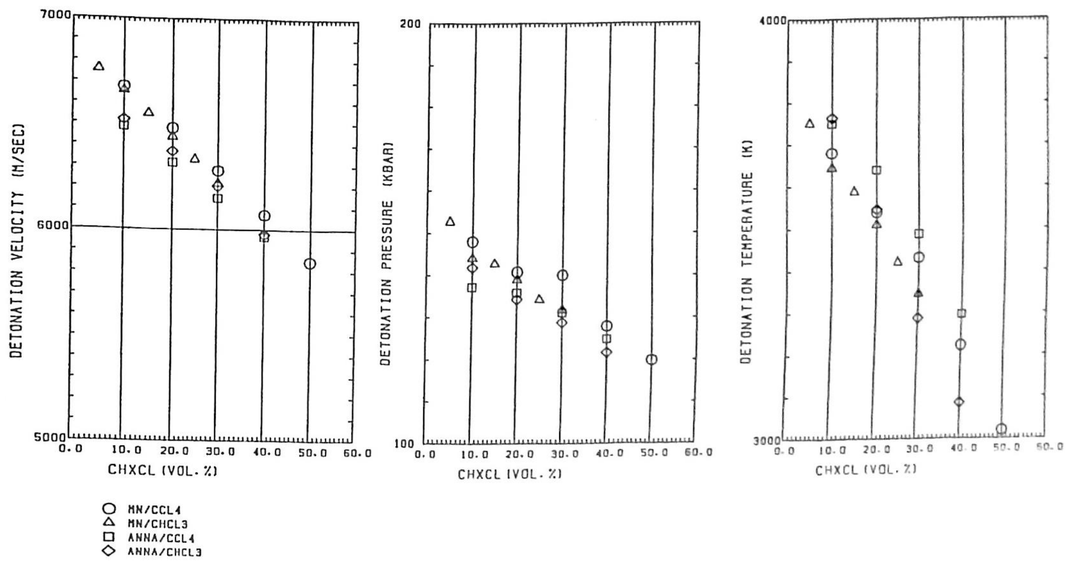
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	ANNA/CCL4 60/40	#ANNA/CHCL3 90/10	#ANNA/CHCL3 80/20	#ANNA/CHCL3 70/30	#ANNA/CHCL3 60/40	#
RHO (G/CC)	1.385	1.275	1.297	1.320	1.342	
EO (KCAL/MOLE)	-46.29	-53.35	-51.77	-50.18	-48.60	
MOL.WEIGHT (G)	138.496	127.461	129.722	131.983	134.244	
C	1.2482	1.3780	1.3625	1.3470	1.3314	
H	2.1740	3.3848	3.1463	2.9078	2.6692	
N	1.3378	2.0068	1.7838	1.5608	1.3378	
O	2.7593	4.1389	3.6790	3.2192	2.7593	
CL	1.6480	0.3714	0.7429	1.1143	1.4858	
DETN.VEL (M/SEC)	5965.9	6516.2	6367.7	6204.8	5979.0	
PARTICL.VEL(")	1511.8	1706.7	1625.8	1572.7	1516.6	
C-J PRESS (KBAR)	124.9	141.8	134.3	128.8	121.7	
C-J VOLUME (CC/G)	0.53906	0.57889	0.57416	0.56556	0.55615	
C-J TEMP (DEG K)	3296.3	3763.0	3545.8	3288.4	3084.6	
C-J S(CAL/DEG MOL)	52.22	55.04	53.79	52.20	51.17	
C-J ENERGY (CAL/G)	273.13	348.09	315.87	295.58	274.86	
GAMMA	2.946	2.818	2.917	2.945	2.942	
C-J DETN.HEAT(CAL)	866.0	1262.8	1118.1	969.0	846.9	
LAMDA	11.4504	9.8065	10.0697	10.3243	10.6767	
VOLUM(K LITTRE/KG)	0.6772	0.8202	0.7922	0.7666	0.7273	
TOTAL PRODCT(MOLE)	3.8334	4.2729	4.2007	4.1358	4.0761	
V GAS (MOLES)	3.8334	4.2729	4.2007	4.1358	3.9910	
V GAS (CC/MOLE)	19.4754	17.2682	17.7305	18.0481	18.6194	
V SOL C(S) (CC/G)	0.34122	0.33412	0.33719	0.33888	0.34189	
H2O (MOL %)	7.7154	34.8903	28.1428	21.0920	14.1494	
CO2 (MOL %)	31.4267	29.0572	26.8301	24.1369	22.9548	
CO (MOL %)	1.1334	3.1934	5.6047	8.4290	7.6187	
N2 (MOL %)	17.3665	23.2967	21.1650	18.8201	16.3828	
H2 (MOL %)	0.0182	0.2307	0.3620	0.4629	0.3064	
O2 (MOL %)	0.0345	0.0501	0.0047	0.0004	0.0001	
NH3 (MOL %)	0.0006	0.0230	0.0479	0.0807	0.0485	
OH (MOL %)	0.0431	0.2175	0.0785	0.0227	0.0090	
H (MOL %)	0.0006	0.0062	0.0049	0.0029	0.0013	
CH4 (MOL %)	0.0000	0.0000	0.0003	0.0023	0.0017	
NO (MOL %)	0.1659	0.3478	0.0858	0.0179	0.0071	
HCL (MOL %)	41.1991	8.6799	17.6608	26.9202	36.4109	
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	
CL2 (MOL %)	0.8963	0.0072	0.0126	0.0122	0.0206	
C(S) (MOL %)	0.0	0.0	0.0	0.0	2.0889	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-12-01>> **********

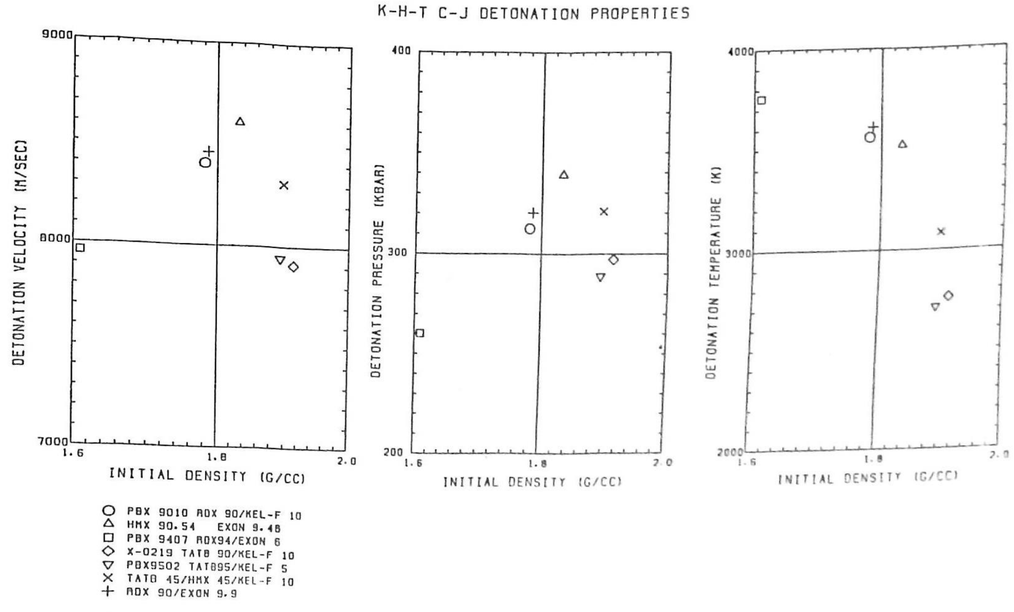
EXPLOSIVES		PBXC-9/HMX75# AL20/VITON 5
RHO	(G/CC)	1.975
EO	(KCAL/MOLE)	-4.36
MOL.WEIGHT	(G)	100.000
C		1.1466
H		2.1195
N		2.0260
O		2.0260
AL		0.7412
F		0.1737
DETN.VEL	(M/SEC)	7967.6
PARTICL.VEL(")		2026.8
C-J PRESS	(KBAR)	318.9
C-J VOLUME	(CC/G)	0.37753
C-J TEMP	(DEG K)	5664.4
C-J S(CAL/DEG MOL)		77.91
C-J ENERGY	(CAL/G)	490.89
GAMMA		2.931
C-J DETN.HEAT	(CAL)	2054.8
LAMDA		7.7638
VOLUM(K LITTRE/KG)		0.5341
TOTAL PRODCT	(MOLE)	3.6114
V GAS	(MOLES)	2.1833
V GAS	(CC/MOLE)	11.7845
V C(S)	(CC/G)	0.25867
V AL2O3(S)	(CC/G)	0.23126
V AL(S)	(CC/G)	0.39013
H2O	(MOL %)	21.7532
CO2	(MOL %)	0.7847
CO	(MOL %)	1.6400
N2	(MOL %)	27.0045
CF4	(MOL %)	0.0000
H2	(MOL %)	2.0791
O2	(MOL %)	0.0020
NH3	(MOL %)	1.9293
OH	(MOL %)	0.1835
H	(MOL %)	0.0615
CH4	(MOL %)	0.0449
NO	(MOL %)	0.1611
HF	(MOL %)	4.8126
F2	(MOL %)	0.0000
C(S)	(MOL %)	29.2810
AL2O3(S)	(MOL %)	10.2628
AL(S)	(MOL %)	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES		PBX 9010 RDX/HMX 90/KEL-F 10	RDX/HMX 90.54 EXON 9.46	PBX 9407 RDX/X-0219 94/EXON 6	TATB 90/KEL-F 10	PBX9502 TATB 95/KEL-F 5	TATB 45/HMX 45/KEL-F 10	RDX 90/EXON 9.9
RHO	(G/CC)	1.781	1.833	1.610	1.914	1.894	1.898	1.786
EO	(KCAL/MOLE)	-1.46	2.59	5.33	-19.95	-16.45	-11.41	3.84
MOL.WEIGHT	(G)	100.000	100.000	100.000	100.000	100.000	100.000	100.000
C		1.4372	1.4150	1.3914	2.3134	2.3188	1.8753	1.4180
H		2.5419	2.5418	2.6001	2.2026	2.2634	2.3723	2.5344
N		2.4311	2.4457	2.5392	2.0918	2.2080	2.2615	2.4338
O		2.4311	2.4457	2.5392	2.0918	2.2080	2.2615	2.4338
F		0.2770	0.1921	0.1219	0.2770	0.1385	0.2770	0.2011
CL		0.0554	0.0961	0.0609	0.0554	0.0277	0.0554	0.1005
DETN.VEL	(M/SEC)	8403.5	8607.3	7958.7	7909.6	7943.0	8309.9	8457.7
PARTICL.VEL(")		2088.4	2148.9	2029.9	1962.6	1920.0	2035.0	2120.2
C-J PRESS	(KBAR)	312.6	339.0	260.1	297.1	288.8	321.0	320.3
C-J VOLUME	(CC/G)	0.42195	0.40935	0.46270	0.39283	0.40036	0.39785	0.41955
C-J TEMP	(DEG K)	3562.0	3520.7	3757.8	2760.0	2710.7	3082.1	3611.4
C-J S(CAL/DEG MOL)		53.93	53.77	54.74	55.06	55.05	54.17	54.16
C-J ENERGY	(CAL/G)	521.20	551.86	492.43	460.31	440.47	494.88	537.18
GAMMA		3.024	3.005	2.921	3.030	3.137	3.084	2.989
C-J DETN.HEAT	(CAL)	1428.1	1434.0	1445.0	1076.0	1081.8	1248.3	1443.6
LAMDA		8.9053	9.0447	9.0508	8.8889	9.0236	8.9038	9.0341
VOLUM(K LITTRE/KG)		0.8161	0.8101	0.8260	0.7082	0.7098	0.7608	0.8107
TOTAL PRODCT	(MOLE)	4.0917	4.0549	4.0524	4.6270	4.6377	4.3590	4.0549
V GAS	(MOLES)	3.3358	3.3111	3.3764	2.8947	2.9014	3.1097	3.3136
V GAS	(CC/MOLE)	11.9617	11.7116	13.0406	11.7324	11.9372	11.6016	11.9911
V SOL C(S)	(CC/G)	0.25254	0.24140	0.27585	0.25573	0.25902	0.24710	0.24953
H2O	(MOL %)	26.8721	27.6914	29.4585	20.1919	22.5897	23.3628	27.3953
CO2	(MOL %)	15.7383	15.9149	15.3534	12.4429	12.4484	14.1116	15.7636
CO	(MOL %)	0.9145	0.6401	2.3031	0.1184	0.1132	0.2509	0.9270
N2	(MOL %)	29.6334	30.0840	31.2166	22.5963	23.7973	25.9173	29.9272
CF4	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	(MOL %)	0.0525	0.0347	0.1795	0.0058	0.0064	0.0124	0.0538
O2	(MOL %)	0.0037	0.0040	0.0036	0.0002	0.0001	0.0009	0.0043
NH3	(MOL %)	0.0377	0.0306	0.1027	0.0058	0.0072	0.0116	0.0413
OH	(MOL %)	0.0339	0.0292	0.0603	0.0020	0.0017	0.0073	0.0376
H	(MOL %)	0.0007	0.0004	0.0025	0.0000	0.0000	0.0001	0.0007
CH4	(MOL %)	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000
NO	(MOL %)	0.1125	0.1174	0.1238	0.0101	0.0081	0.0348	0.1273
HCL	(MOL %)	1.3563	2.3711	1.5056	1.1999	0.6002	1.2735	2.4811
CCL4	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF	(MOL %)	6.7718	4.7402	3.0091	5.9889	2.9890	6.3569	4.9605
F2	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2	(MOL %)	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
CLF	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S)	(MOL %)	18.4726	18.3420	16.6810	37.4377	37.4386	28.6599	18.2902

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

PBX 9010 RDX 90/KEL-F 10 RHO = 1.7810 G/CC EO = -1.461469E+03 CAL/MOLE

LN P = -3.52878380 E+00 -2.44284058 E+00LN V 3.25861812 E-01LN V*2 -3.15916538 E-02LN V*3 7.99122499 E-04LN V*4

LN T = 7.69369888 E+00 -4.67674077 E-01LN V 1.30983531 E-01LN V*2 -2.06170082 E-02LN V*3 1.06369518 E-03LN V*4

LN E = -1.63180923 E+00 4.69664752 E-01LNP 7.24001527 E-02LN P*2 5.52829355 E-03LN P*3 1.57053510 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (638.190)*	0.3375	4484.8 (4377.2)*	-1442.4	0.16035 (0.15668)*	3.2667	530.2
500.000 (516.659)*	0.3602	4151.6 (4150.0)*	-1120.5	0.14688 (0.14597)*	3.2105	1012.8
400.000 (406.202)*	0.3885	3842.7 (3909.4)*	-805.6	0.13371 (0.13459)*	3.1463	1548.0
312.563 (314.184)*	0.4220	3562.0 (3672.2)*	-520.8	0.12179 (0.12387)*	3.0778	2088.4
300.000 (300.432)*	0.4282	3539.2 (3632.8)*	-487.1	0.12038 (0.12226)*	3.0658	2180.7
200.000 (194.789)*	0.4945	3295.6 (3279.4)*	-185.1	0.10775 (0.10837)*	2.9499	3014.6
100.000 (95.559)*	0.6347	2858.8 (2794.3)*	204.4	0.09145 (0.09140)*	2.7590	4181.2
80.000 (76.380)*	0.6890	2724.2 (2662.9)*	301.4	0.08739 (0.08726)*	2.6989	4503.6
60.000 (57.408)*	0.7671	2556.1 (2508.1)*	411.7	0.08277 (0.08263)*	2.6224	4887.7
50.000 (47.992)*	0.8218	2455.2 (2417.9)*	473.3	0.08020 (0.08006)*	2.5744	5114.6
40.000 (38.599)*	0.8953	2338.7 (2314.8)*	540.9	0.07737 (0.07723)*	2.5161	5377.0
30.000 (29.056)*	1.0040	2202.4 (2190.4)*	616.5	0.07420 (0.07404)*	2.4402	5698.4
20.000 (19.718)*	1.1810	2029.1 (2037.4)*	706.3	0.07045 (0.07028)*	2.3370	6103.5
10.000 (10.160)*	1.5860	1790.9 (1815.1)*	824.3	0.06551 (0.06531)*	2.1621	6718.8
8.000 (8.202)*	1.7534	1726.7 (1752.5)*	855.9	0.06419 (0.06402)*	2.1062	6899.7
6.000 (6.202)*	2.0069	1652.8 (1677.0)*	892.1	0.06268 (0.06252)*	2.0338	7124.3
5.000 (5.187)*	2.1936	1610.1 (1632.0)*	913.1	0.06180 (0.06165)*	1.9878	7261.9
4.000 (4.161)*	2.4547	1561.3 (1579.9)*	937.3	0.06078 (0.06066)*	1.9317	7425.4
3.000 (3.116)*	2.8595	1505.3 (1516.7)*	964.9	0.05963 (0.05950)*	1.8590	7630.6
2.000 (2.067)*	3.5879	1432.6 (1436.3)*	1001.7	0.05809 (0.05802)*	1.7582	7905.5
1.000 (1.018)*	5.4779	1325.2 (1319.0)*	1057.5	0.05575 (0.05580)*	1.5928	8343.8
0.800 (0.810)*	6.3389	1294.3 (1286.0)*	1073.8	0.05507 (0.05514)*	1.5424	8477.5
0.600 (0.603)*	7.7053	1255.9 (1246.2)*	1094.2	0.05422 (0.05432)*	1.4800	8645.1
0.500 (0.500)*	8.7573	1232.3 (1222.4)*	1106.8	0.05369 (0.05381)*	1.4423	8749.0
0.400 (0.398)*	10.2902	1204.2 (1194.5)*	1121.9	0.05306 (0.05320)*	1.3981	8874.1
0.300 (0.296)*	12.7625	1168.7 (1160.3)*	1140.9	0.05227 (0.05242)*	1.3450	9032.2
0.200 (0.196)*	17.5131	1119.7 (1114.4)*	1167.0	0.05117 (0.05135)*	1.2788	9249.4
0.100 (0.097)*	30.8917	1037.9 (1038.8)*	1210.0	0.04937 (0.04954)*	1.1934	9605.6
0.080 (0.078)*	37.2698	1012.3 (1014.4)*	1223.0	0.04883 (0.04897)*	1.1741	9716.5
0.060 (0.059)*	47.5450	979.2 (982.7)*	1239.5	0.04814 (0.04824)*	1.1554	9856.6
0.050 (0.049)*	55.5103	958.3 (962.3)*	1249.7	0.04771 (0.04778)*	1.1470	9943.8
0.040 (0.039)*	67.1253	932.8 (936.9)*	1261.9	0.04720 (0.04723)*	1.1404	10049.1
0.030 (0.030)*	85.7635	900.0 (903.6)*	1277.0	0.04657 (0.04654)*	1.1378	10182.5
0.020 (0.020)*	121.0321	853.6 (855.7)*	1297.2	0.04572 (0.04560)*	1.1445	10366.5
0.010 (0.010)*	216.8820	773.1 (772.5)*	1329.1	0.04439 (0.04418)*	1.1820	10670.0
0.008 (0.008)*	261.0576	746.5 (745.9)*	1338.8	0.04399 (0.04378)*	1.2002	10764.5
0.006 (0.006)*	331.5715	713.3 (711.8)*	1350.2	0.04351 (0.04332)*	1.2279	10885.0
0.005 (0.005)*	385.7166	692.6 (690.5)*	1357.1	0.04322 (0.04306)*	1.2477	10960.3
0.004 (0.004)*	463.4180	666.9 (665.1)*	1365.3	0.04288 (0.04279)*	1.2741	11050.6
0.003 (0.003)*	586.3408	634.2 (633.4)*	1375.3	0.04246 (0.04252)*	1.3115	11164.5
0.002 (0.002)*	814.8437	588.8 (591.2)*	1388.5	0.04191 (0.04231)*	1.3699	11319.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

PBX 9010 RDX 90/KEL-F 10 RHO = 1.7810 G/CC EO = -1.461469E+03 CAL/MOLE

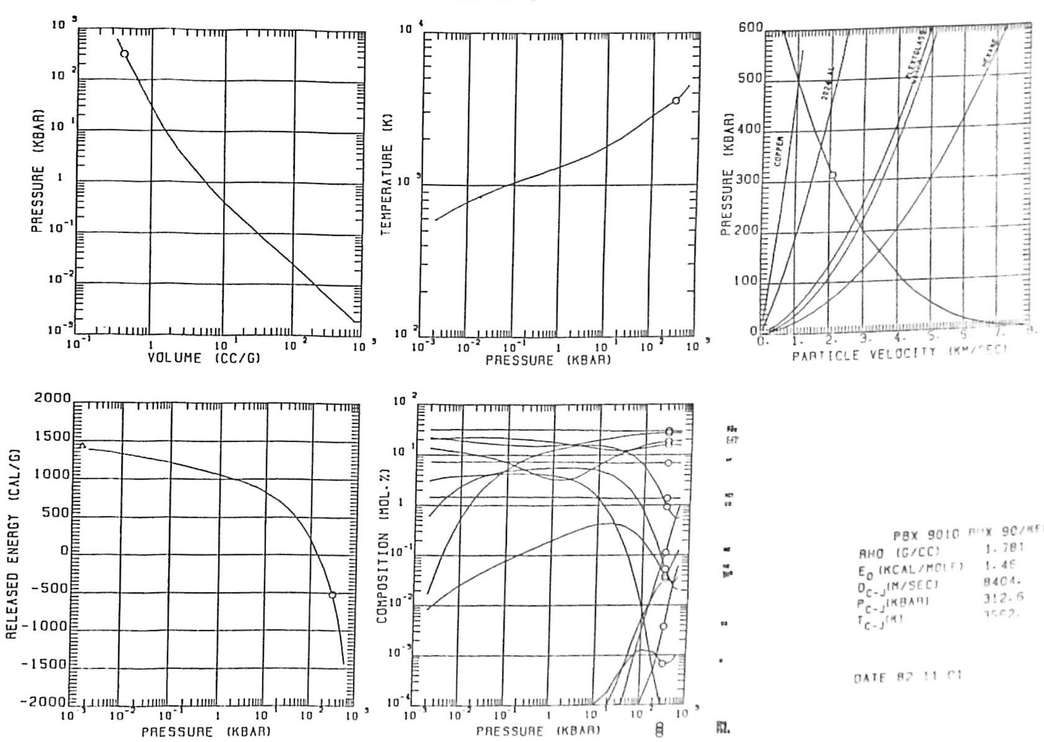
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 CLF	H2 C(S)	O2	NH3	OH	H	CH4	NO	HCL
312.563	1.09950	0.64392	0.03751	1.21250	0.00000	0.00215	0.00015	0.00154	0.00139	0.00003	0.00000	0.00460	0.05550
	0.00000	0.27708	0.00000	0.00000	0.00000	0.75578							
300.000	1.09906	0.64262	0.04114	1.21268	0.00000	0.00244	0.00013	0.00166	0.00133	0.00003	0.00000	0.00412	0.05550
	0.00000	0.27708	0.00000	0.00000	0.00000	0.75345							
200.000	1.09182	0.62250	0.09222	1.21330	0.00000	0.00749	0.00002	0.00327	0.00081	0.00005	0.00002	0.00126	0.05550
	0.00000	0.27708	0.00000	0.00000	0.00000	0.72248							
100.000	1.06120	0.56651	0.23658	1.21160	0.00000	0.03094	0.00000	0.00781	0.00022	0.00005	0.00035	0.00013	0.05550
	0.00000	0.27708	0.00000	0.00000	0.00000	0.63378							
80.000	1.04484	0.54730	0.29151	1.21073	0.00000	0.04378	0.00000	0.00962	0.00013	0.00005	0.00077	0.00006	0.05550
	0.00000	0.27709	0.00000	0.00000	0.00000	0.59763							
60.000	1.01888	0.52569	0.36080	1.20958	0.00000	0.06396	0.00000	0.01197	0.00006	0.00004	0.00191	0.00002	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	0.54881							
50.000	0.99974	0.51467	0.40202	1.20888	0.00000	0.07842	0.00000	0.01337	0.00004	0.00003	0.00321	0.00001	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	0.51731							
40.000	0.97363	0.50455	0.44839	1.20811	0.00000	0.09727	0.00000	0.01491	0.00002	0.00002	0.00569	0.00000	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	0.47858							
30.000	0.93751	0.49779	0.49816	1.20742	0.00000	0.12160	0.00000	0.01630	0.00001	0.00001	0.01054	0.00000	0.05552
	0.00000	0.27710	0.00000	0.00000	0.00000	0.43074							
20.000	0.87874	0.49873	0.55502	1.20682	0.00000	0.15433	0.00000	0.01751	0.00000	0.00001	0.02266	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	0.36081							
10.000	0.77518	0.52577	0.60445	1.20726	0.00000	0.19331	0.00000	0.01663	0.00000	0.00000	0.05560	0.00000	0.05553
	0.00000	0.27712	0.00000	0.00000	0.00000	0.25139							
8.000	0.74481	0.53960	0.60717	1.20767	0.00000	0.20037	0.00000	0.01580	0.00000	0.00000	0.06788	0.00000	0.05554
	0.00000	0.27712	0.00000	0.00000	0.00000	0.22257							
6.000	0.70826	0.55857	0.60577	1.20829	0.00000	0.20703	0.00000	0.01457	0.00000	0.00000	0.08375	0.00000	0.05554
	0.00000	0.27712	0.00000	0.00000	0.00000	0.18914							
5.000	0.68740	0.57124	0.60130	1.20870	0.00000	0.20987	0.00000	0.01375	0.00000	0.00000	0.09337	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	0.17131							
4.000	0.66475	0.58737	0.59169	1.20921	0.00000	0.21202	0.00000	0.01273	0.00000	0.00000	0.10439	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	0.15378							
3.000	0.63866	0.60709	0.57835	1.20984	0.00000	0.21433	0.00000	0.01147	0.00000	0.00000	0.11722	0.00000	0.05555
	0.00000	0.27713	0.00000	0.00000	0.00000	0.13457							
2.000	0.61123	0.63647	0.54702	1.21066	0.00000	0.21449	0.00000	0.00982	0.00000	0.00000	0.13208	0.00000	0.05556
	0.00000	0.27714	0.00000	0.00000	0.00000	0.12167							
1.000	0.58216	0.68521	0.47862	1.21183	0.00000	0.21152	0.00000	0.00750	0.00000	0.00000	0.14984	0.00000	0.05557
	0.00000	0.27716	0.00000	0.00000	0.00000	0.12360							
0.800	0.57670	0.70004	0.45442	1.21214	0.00000	0.21015	0.00000	0.00687	0.00000	0.00000	0.15372	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	0.12903							
0.600	0.57242	0.71884	0.42110	1.21251	0.00000	0.20785	0.00000	0.00614	0.00000	0.00000	0.15756	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	0.13971							
0.500	0.57120	0.73045	0.39912	1.21272	0.00000	0.20614	0.00000	0.00571	0.00000	0.00000	0.15935	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	0.14833							
0.400	0.57112	0.74419	0.37171	1.21296	0.00000	0.20385	0.00000	0.00523	0.00000	0.00000	0.16089	0.00000	0.05559
	0.00000	0.27717	0.00000	0.00000	0.00000	0.16043							
0.300	0.57328	0.76122	0.33549	1.21325	0.00000	0.20042	0.00000	0.00465	0.00000	0.00000	0.16195	0.00000	0.05560
	0.00000	0.27719	0.00000	0.00000	0.00000	0.17856							
0.200	0.58034	0.78358	0.28373	1.21361	0.00000	0.19449	0.00000	0.00393	0.00000	0.00000	0.16193	0.00000	0.05560
	0.00000	0.27719	0.00000	0.00000	0.00000	0.20801							
0.100	0.60109	0.81616	0.19781	1.21412	0.00000	0.18050	0.00000	0.00292	0.00000	0.00000	0.15929	0.00000	0.05562
	0.00000	0.27723	0.00000	0.00000	0.00000	0.26396							
0.080	0.60941	0.82458	0.17267	1.21425	0.00000	0.17506	0.00000	0.00265	0.00000	0.00000	0.15805	0.00000	0.05563

	0.00000	0.27724	0.00000	0.00000	0.00000	0.28194							
0.060	0.62135	0.83399	0.14191	1.21442	0.00000	0.16688	0.00000	0.00233	0.00000	0.00000	0.15641	0.00000	0.05563
	0.00000	0.27725	0.00000	0.00000	0.00000	0.30493							
0.050	0.62955	0.83897	0.12376	1.21451	0.00000	0.16106	0.00000	0.00214	0.00000	0.00000	0.15536	0.00000	0.05564
	0.00000	0.27724	0.00000	0.00000	0.00000	0.31914							
0.040	0.64012	0.84393	0.10328	1.21461	0.00000	0.15336	0.00000	0.00193	0.00000	0.00000	0.15408	0.00000	0.05565
	0.00000	0.27725	0.00000	0.00000	0.00000	0.33595							
0.030	0.65471	0.84841	0.07973	1.21474	0.00000	0.14242	0.00000	0.00169	0.00000	0.00000	0.15243	0.00000	0.05566
	0.00000	0.27727	0.00000	0.00000	0.00000	0.35667							
0.020	0.67720	0.85091	0.05224	1.21489	0.00000	0.12502	0.00000	0.00138	0.00000	0.00000	0.15011	0.00000	0.05567
	0.00000	0.27730	0.00000	0.00000	0.00000	0.38397							
0.010	0.72134	0.84462	0.02069	1.21511	0.00000	0.09106	0.00000	0.00096	0.00000	0.00000	0.14532	0.00000	0.05570
	0.00000	0.27734	0.00000	0.00000	0.00000	0.42661							
0.008	0.73727	0.83986	0.01429	1.21517	0.00000	0.07944	0.00000	0.00084	0.00000	0.00000	0.14324	0.00000	0.05571
	0.00000	0.27737	0.00000	0.00000	0.00000	0.43986							
0.006	0.75791	0.83241	0.00858	1.21523	0.00000	0.06555	0.00000	0.00070	0.00000	0.00000	0.13996	0.00000	0.05572
	0.00000	0.27739	0.00000	0.00000	0.00000	0.45632							
0.005	0.77125	0.82700	0.00606	1.21527	0.00000	0.05733	0.00000	0.00063	0.00000	0.00000	0.13745	0.00000	0.05572
	0.00000	0.27740	0.00000	0.00000	0.00000	0.46675							
0.004	0.78835	0.81960	0.00378	1.21532	0.00000	0.04755	0.00000	0.00054	0.00000	0.00000	0.13385	0.00000	0.05574
	0.00000	0.27742	0.00000	0.00000	0.00000	0.48005							
0.003	0.81106	0.80917	0.00193	1.21537	0.00000	0.03622	0.00000	0.00044	0.00000	0.00000	0.12824	0.00000	0.05575
	0.00000	0.27739	0.00000	0.00000	0.00000	0.49792							
0.002	0.84408	0.79330	0.00066	1.21543	0.00000	0.02313	0.00000	0.00032	0.00000	0.00000	0.11836	0.00000	0.05577
	0.00000	0.27742	0.00000	0.00000	0.00000	0.52495							
400.000	1.10035	0.64466	0.02698	1.20937	0.00000	0.00130	0.00052	0.00124	0.00230	0.00003	0.00000	0.01115	0.05550
	0.00000	0.27708	0.00000	0.00000	0.00000	0.76558							
500.000	1.10022	0.63970	0.02175	1.20328	0.00000	0.00090	0.00140	0.00117	0.00357	0.00003	0.00000	0.02340	0.05549
	0.00000	0.27708	0.00000	0.00000	0.00000	0.77577							
600.000	1.09904	0.63072	0.02245	1.19567	0.00000	0.00084	0.00243	0.00150	0.00506	0.00004	0.00000	0.03830	0.05549
	0.00000	0.27708	0.00000	0.00000	0.00000	0.78405							

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

HMX 90.54 EXON 9.46 RHO = 1.8330 G/CC EO = 2.587461E+03 CAL/MOLE

LN P = -3.54359913 E+00 -2.44970608 E+00LN V 3.26809943 E-01LN V*2 -3.15136984 E-02LN V*3 7.70352781 E-04LN V*4

LN T = 7.67417145 E+00 -4.58127260 E-01LN V 1.25720680 E-01LN V*2 -1.96086429 E-02LN V*3 9.87525797 E-04LN V*4

LN E = -1.65377235 E+00   4.63785350 E-01LNP 7.09444284 E-02LN P*2 5.38367778 E-03LN P*3 1.52311521 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (637.862)	0.3369	4313.6 (4222.2)	-1365.2	0.15712 (0.15368)	3.2768	773.7
500.000 (516.786)	0.3594	3998.6 (4010.5)	-1052.5	0.14403 (0.14329)	3.2208	1252.5
400.000 (406.892)	0.3874	3705.1 (3786.4)	-745.7	0.13120 (0.13223)	3.1572	1783.2
* 339.044 (342.351)	0.4094	3520.7 (3634.6)	-551.8	0.12309 (0.12505)	3.1111	2148.9
300.000 (299.510)	0.4274	3454.2 (3522.5)	-448.3	0.11876 (0.12022)	3.0754	2427.1
200.000 (194.409)	0.4933	3220.2 (3190.4)	-149.1	0.10624 (0.10669)	2.9599	3255.6
100.000 (95.447)	0.6324	2802.1 (2731.1)	235.2	0.09016 (0.09009)	2.7694	4416.2
80.000 (76.318)	0.6862	2672.1 (2606.2)	331.1	0.08615 (0.08602)	2.7095	4736.6
60.000 (57.377)	0.7635	2509.8 (2458.6)	439.9	0.08159 (0.08148)	2.6330	5118.6
50.000 (47.972)	0.8177	2412.2 (2372.3)	500.6	0.07905 (0.07895)	2.5851	5344.3
40.000 (38.588)	0.8904	2299.3 (2273.5)	567.3	0.07626 (0.07617)	2.5268	5605.2
30.000 (29.048)	0.9980	2166.8 (2154.0)	641.8	0.07315 (0.07303)	2.4510	5925.0
20.000 (19.716)	1.1730	1998.0 (2006.6)	730.4	0.06944 (0.06932)	2.3478	6327.6
10.000 (10.162)	1.5730	1765.6 (1791.3)	846.5	0.06458 (0.06442)	2.1728	6939.0
8.000 (8.205)	1.7380	1702.6 (1730.4)	877.8	0.06327 (0.06314)	2.1168	7118.5
6.000 (6.206)	1.9876	1630.2 (1656.8)	913.4	0.06178 (0.06166)	2.0443	7341.4
5.000 (5.190)	2.1714	1588.4 (1612.8)	934.0	0.06092 (0.06080)	1.9983	7477.9
4.000 (4.164)	2.4283	1540.5 (1561.8)	957.8	0.05992 (0.05982)	1.9421	7640.1
3.000 (3.118)	2.8265	1485.8 (1499.7)	984.7	0.05880 (0.05867)	1.8692	7843.7
2.000 (2.068)	3.5424	1414.4 (1420.4)	1020.9	0.05729 (0.05721)	1.7680	8116.4
1.000 (1.017)	5.4009	1309.7 (1303.8)	1074.7	0.05504 (0.05502)	1.6015	8551.5
0.800 (0.810)	6.2398	1278.1 (1271.0)	1091.5	0.05433 (0.05438)	1.5510	8683.1
0.600 (0.603)	7.5773	1240.2 (1231.2)	1111.4	0.05350 (0.05357)	1.4882	8849.0
0.500 (0.500)	8.6059	1216.9 (1207.4)	1123.8	0.05298 (0.05308)	1.4501	8951.7
0.400 (0.398)	10.1037	1189.0 (1179.4)	1138.5	0.05237 (0.05248)	1.4056	9075.4
0.300 (0.296)	12.5171	1153.9 (1145.0)	1157.0	0.05159 (0.05172)	1.3520	9231.6
0.200 (0.196)	17.1501	1105.2 (1098.7)	1182.5	0.05052 (0.05068)	1.2850	9446.1
0.100 (0.097)	30.1830	1023.4 (1022.7)	1224.4	0.04877 (0.04893)	1.1983	9797.8
0.080 (0.078)	36.3910	997.7 (998.2)	1237.1	0.04824 (0.04837)	1.1787	9907.2
0.060 (0.059)	46.3852	964.4 (966.4)	1253.2	0.04757 (0.04767)	1.1596	10045.4
0.050 (0.049)	54.1272	943.2 (946.0)	1263.1	0.04715 (0.04722)	1.1511	10131.3
0.040 (0.039)	65.4091	917.5 (920.7)	1274.9	0.04666 (0.04669)	1.1444	10235.1
0.030 (0.030)	83.4904	884.3 (887.4)	1289.5	0.04605 (0.04602)	1.1416	10366.4
0.020 (0.020)	117.6581	837.2 (839.6)	1309.2	0.04522 (0.04512)	1.1485	10547.4
0.010 (0.010)	210.3221	755.9 (756.2)	1339.9	0.04394 (0.04374)	1.1869	10845.8
0.008 (0.008)	252.9065	728.9 (729.4)	1349.2	0.04355 (0.04336)	1.2056	10938.6
0.006 (0.006)	320.8284	695.4 (695.0)	1360.3	0.04309 (0.04291)	1.2340	11056.8
0.005 (0.005)	372.9021	674.6 (673.5)	1366.8	0.04281 (0.04266)	1.2545	11130.7
0.004 (0.004)	447.6155	648.8 (647.6)	1374.7	0.04248 (0.04239)	1.2817	11219.3
0.003 (0.003)	565.7114	616.1 (615.2)	1384.4	0.04208 (0.04213)	1.3203	11331.0
0.002 (0.002)	784.9827	570.9 (571.6)	1397.1	0.04154 (0.04191)	1.3809	11483.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

HMX 90.54 EXON 9.46 RHO = 1.8330 G/CC EO = 2.587461E+03 CAL/MOLE

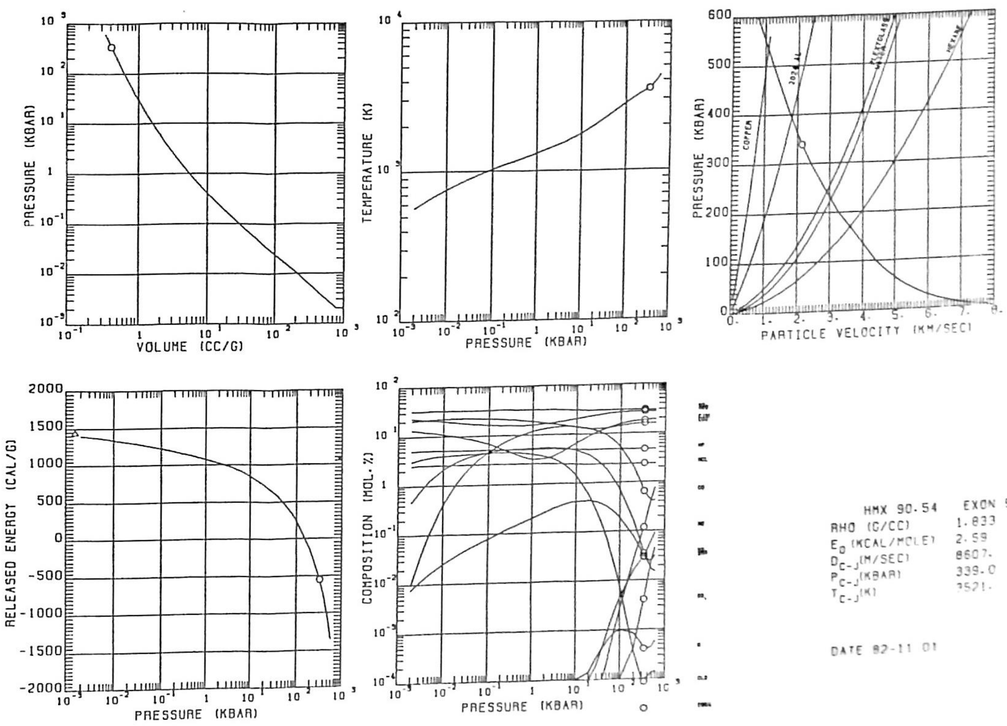
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	CF4	H2	O2	NH3	OH	H	CH4	NO	HCL
	CCL4	HF	F2	CL2	CLF	C(S)							
339.044	1.12285	0.64532	0.02597	1.21987	0.00000	0.00141	0.00016	0.00124	0.00118	0.00002	0.00000	0.00476	0.09615
	0.00000	0.19221	0.00000	0.00000	0.00000	0.74373							
300.000	1.12176	0.64233	0.03465	1.22038	0.00000	0.00208	0.00010	0.00156	0.00106	0.00002	0.00000	0.00340	0.09614
	0.00000	0.19221	0.00000	0.00000	0.00000	0.73804							
200.000	1.11514	0.62469	0.07950	1.22080	0.00000	0.00656	0.00002	0.00310	0.00064	0.00003	0.00001	0.00103	0.09614
	0.00000	0.19221	0.00000	0.00000	0.00000	0.71082							
100.000	1.08652	0.57384	0.21125	1.21903	0.00000	0.02812	0.00000	0.00756	0.00018	0.00004	0.00031	0.00010	0.09615
	0.00000	0.19221	0.00000	0.00000	0.00000	0.62962							
80.000	1.07111	0.55617	0.26213	1.21817	0.00000	0.04010	0.00000	0.00935	0.00011	0.00004	0.00070	0.00005	0.09615
	0.00000	0.19221	0.00000	0.00000	0.00000	0.59602							
60.000	1.04640	0.53604	0.32718	1.21700	0.00000	0.05913	0.00000	0.01170	0.00005	0.00003	0.00179	0.00002	0.09616
	0.00000	0.19222	0.00000	0.00000	0.00000	0.55002							
50.000	1.02805	0.52577	0.36611	1.21630	0.00000	0.07288	0.00000	0.01312	0.00003	0.00002	0.00303	0.00001	0.09616
	0.00000	0.19222	0.00000	0.00000	0.00000	0.52011							
40.000	1.00285	0.51641	0.41006	1.21551	0.00000	0.09092	0.00000	0.01470	0.00002	0.00002	0.00543	0.00000	0.09616
	0.00000	0.19223	0.00000	0.00000	0.00000	0.48313							
30.000	0.96767	0.51036	0.45734	1.21479	0.00000	0.11438	0.00000	0.01616	0.00001	0.00001	0.01020	0.00000	0.09616
	0.00000	0.19223	0.00000	0.00000	0.00000	0.43712							
20.000	0.90964	0.51230	0.51150	1.21413	0.00000	0.14628	0.00000	0.01747	0.00000	0.00001	0.02229	0.00000	0.09617
	0.00000	0.19223	0.00000	0.00000	0.00000	0.36894							
10.000	0.80518	0.54098	0.55862	1.21450	0.00000	0.18479	0.00000	0.01674	0.00000	0.00000	0.05580	0.00000	0.09618
	0.00000	0.19224	0.00000	0.00000	0.00000	0.25963							
8.000	0.77410	0.55540	0.56085	1.21490	0.00000	0.19178	0.00000	0.01593	0.00000	0.00000	0.06845	0.00000	0.09618
	0.00000	0.19225	0.00000	0.00000	0.00000	0.23032							
6.000	0.73647	0.57504	0.55921	1.21551	0.00000	0.19841	0.00000	0.01471	0.00000	0.00000	0.08486	0.00000	0.09619
	0.00000	0.19226	0.00000	0.00000	0.00000	0.19592							
5.000	0.71481	0.58802	0.55491	1.21592	0.00000	0.20128	0.00000	0.01389	0.00000	0.00000	0.09487	0.00000	0.09619
	0.00000	0.19226	0.00000	0.00000	0.00000	0.17723							
4.000	0.69122	0.60443	0.54569	1.21643	0.00000	0.20346	0.00000	0.01287	0.00000	0.00000	0.10634	0.00000	0.09619
	0.00000	0.19226	0.00000	0.00000	0.00000	0.15858							
3.000	0.66385	0.62433	0.53326	1.21706	0.00000	0.20589	0.00000	0.01161	0.00000	0.00000	0.11976	0.00000	0.09620
	0.00000	0.19226	0.00000	0.00000	0.00000	0.13768							
2.000	0.63499	0.65381	0.50316	1.21789	0.00000	0.20607	0.00000	0.00995	0.00000	0.00000	0.13533	0.00000	0.09621
	0.00000	0.19227	0.00000	0.00000	0.00000	0.12273							
1.000	0.60352	0.70117	0.43993	1.21906	0.00000	0.20365	0.00000	0.00761	0.00000	0.00000	0.15403	0.00000	0.09622
	0.00000	0.19229	0.00000	0.00000	0.00000	0.11992							
0.800	0.59840	0.71659	0.41422	1.21939	0.00000	0.20148	0.00000	0.00697	0.00000	0.00000	0.15816	0.00000	0.09622
	0.00000	0.19230	0.00000	0.00000	0.00000	0.12610							
0.600	0.59367	0.73483	0.38245	1.21976	0.00000	0.19905	0.00000	0.00622	0.00000	0.00000	0.16229	0.00000	0.09622
	0.00000	0.19230	0.00000	0.00000	0.00000	0.13547							
0.500	0.59220	0.74604	0.36151	1.21997	0.00000	0.19724	0.00000	0.00579	0.00000	0.00000	0.16425	0.00000	0.09623
	0.00000	0.19230	0.00000	0.00000	0.00000	0.14325							
0.400	0.59191	0.75920	0.33549	1.22022	0.00000	0.19479	0.00000	0.00530	0.00000	0.00000	0.16599	0.00000	0.09624
	0.00000	0.19231	0.00000	0.00000	0.00000	0.15436							
0.300	0.59387	0.77536	0.30122	1.22051	0.00000	0.19114	0.00000	0.00472	0.00000	0.00000	0.16727	0.00000	0.09624
	0.00000	0.19231	0.00000	0.00000	0.00000	0.17119							
0.200	0.60079	0.79629	0.25243	1.22088	0.00000	0.18480	0.00000	0.00399	0.00000	0.00000	0.16752	0.00000	0.09625
	0.00000	0.19232	0.00000	0.00000	0.00000	0.19879							
0.100	0.62190	0.82588	0.17217	1.22139	0.00000	0.16993	0.00000	0.00296	0.00000	0.00000	0.16517	0.00000	0.09627
	0.00000	0.19235	0.00000	0.00000	0.00000	0.25183							
0.080	0.63046	0.83324	0.14889	1.22153	0.00000	0.16414	0.00000	0.00268	0.00000	0.00000	0.16399	0.00000	0.09627

	0.00000	0.19235	0.00000	0.00000	0.00000	0.26894							
0.060	0.64280	0.84118	0.12068	1.22170	0.00000	0.15551	0.00000	0.00235	0.00000	0.00000	0.16238	0.00000	0.09628
	0.00000	0.19236	0.00000	0.00000	0.00000	0.29083							
0.050	0.65132	0.84517	0.10417	1.22179	0.00000	0.14939	0.00000	0.00216	0.00000	0.00000	0.16131	0.00000	0.09628
	0.00000	0.19236	0.00000	0.00000	0.00000	0.30440							
0.040	0.66230	0.84890	0.08575	1.22190	0.00000	0.14136	0.00000	0.00195	0.00000	0.00000	0.16000	0.00000	0.09629
	0.00000	0.19237	0.00000	0.00000	0.00000	0.32040							
0.030	0.67750	0.85176	0.06484	1.22203	0.00000	0.13000	0.00000	0.00169	0.00000	0.00000	0.15827	0.00000	0.09630
	0.00000	0.19238	0.00000	0.00000	0.00000	0.34019							
0.020	0.70092	0.85194	0.04105	1.22219	0.00000	0.11227	0.00000	0.00138	0.00000	0.00000	0.15565	0.00000	0.09632
	0.00000	0.19239	0.00000	0.00000	0.00000	0.36641							
0.010	0.74647	0.84212	0.01516	1.22241	0.00000	0.07898	0.00000	0.00094	0.00000	0.00000	0.14983	0.00000	0.09635
	0.00000	0.19242	0.00000	0.00000	0.00000	0.40796							
0.008	0.76299	0.83637	0.01016	1.22247	0.00000	0.06785	0.00000	0.00082	0.00000	0.00000	0.14723	0.00000	0.09635
	0.00000	0.19244	0.00000	0.00000	0.00000	0.42132							
0.006	0.78428	0.82788	0.00586	1.22254	0.00000	0.05487	0.00000	0.00068	0.00000	0.00000	0.14317	0.00000	0.09637
	0.00000	0.19245	0.00000	0.00000	0.00000	0.43816							
0.005	0.79804	0.82192	0.00402	1.22258	0.00000	0.04732	0.00000	0.00061	0.00000	0.00000	0.14012	0.00000	0.09637
	0.00000	0.19246	0.00000	0.00000	0.00000	0.44902							
0.004	0.81562	0.81393	0.00242	1.22262	0.00000	0.03856	0.00000	0.00052	0.00000	0.00000	0.13577	0.00000	0.09639
	0.00000	0.19248	0.00000	0.00000	0.00000	0.46295							
0.003	0.83890	0.80292	0.00118	1.22268	0.00000	0.02867	0.00000	0.00041	0.00000	0.00000	0.12914	0.00000	0.09640
	0.00000	0.19249	0.00000	0.00000	0.00000	0.48182							
0.002	0.87273	0.78642	0.00038	1.22274	0.00000	0.01764	0.00000	0.00029	0.00000	0.00000	0.11781	0.00000	0.09643
	0.00000	0.19253	0.00000	0.00000	0.00000	0.51047							
400.000	1.12328	0.64533	0.02061	1.21796	0.00000	0.00099	0.00038	0.00107	0.00167	0.00002	0.00000	0.00875	0.09614
	0.00000	0.19221	0.00000	0.00000	0.00000	0.74909							
500.000	1.12322	0.64129	0.01653	1.21302	0.00000	0.00067	0.00104	0.00100	0.00262	0.00002	0.00000	0.01869	0.09614
	0.00000	0.19221	0.00000	0.00001	0.00000	0.75721							
600.000	1.12230	0.63407	0.01708	1.20678	0.00000	0.00062	0.00182	0.00129	0.00371	0.00002	0.00000	0.03088	0.09614
	0.00000	0.19221	0.00000	0.00001	0.00000	0.76389							

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

PBX 9407 RDX94/EXON 6 RHO = 1.6100 G/CC EO = 5.325121E+03 CAL/MOLE

LN P = -3.43231010 E+00 -2.44067383 E+00LN V 3.20372283 E-01LN V*2 -3.05582061 E-02LN V*3 7.89075159 E-04LN V*4

LN T = 7.76923561 E+00 -5.02482057 E-01LN V 1.45987630 E-01LN V*2 -2.32332535 E-02LN V*3 1.26345619 E-03LN V*4

LN E = -1.55908585 E+00 4.93421316 E-01LNP 7.64520764 E-02LN P*2 5.85449859 E-03LN P*3 1.66203696 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (633.890)	0.3473	4996.3 (4880.1)	-1678.3	0.17022 (0.16663)	3.2245	49.6
500.000 (515.434)	0.3705	4623.8 (4609.9)	-1329.6	0.15563 (0.15470)	3.1703	543.0
400.000 (405.729)	0.3999	4275.3 (4320.9)	-987.8	0.14133 (0.14207)	3.1074	1092.6
300.000 (300.946)	0.4408	3915.0 (3992.5)	-639.0	0.12674 (0.12845)	3.0288	1734.3
* 260.106 (260.005)	0.4627	3757.8 (3843.8)	-492.1	0.12059 (0.12262)	2.9903	2029.9
200.000 (196.552)	0.5087	3571.4 (3579.4)	-292.2	0.11223 (0.11321)	2.9166	2569.2
100.000 (96.143)	0.6555	3058.4 (3008.8)	127.0	0.09469 (0.09473)	2.7279	3769.7
80.000 (76.712)	0.7127	2905.4 (2855.8)	230.1	0.09037 (0.09025)	2.6683	4102.7
60.000 (57.563)	0.7949	2713.9 (2677.2)	348.6	0.08541 (0.08526)	2.5926	4498.8
50.000 (48.079)	0.8526	2599.8 (2573.8)	414.7	0.08265 (0.08248)	2.5452	4732.5
40.000 (38.627)	0.9301	2469.1 (2456.3)	487.2	0.07962 (0.07945)	2.4876	5002.9
30.000 (29.111)	1.0439	2317.5 (2316.7)	568.2	0.07623 (0.07604)	2.4133	5331.3
20.000 (19.724)	1.2310	2125.6 (2145.1)	664.6	0.07219 (0.07201)	2.3115	5748.8
10.000 (10.146)	1.6598	1867.8 (1899.1)	789.6	0.06696 (0.06673)	2.1391	6382.6
8.000 (8.187)	1.8373	1798.8 (1830.9)	823.1	0.06556 (0.06536)	2.0841	6568.8
6.000 (6.190)	2.1060	1722.5 (1748.9)	861.3	0.06397 (0.06377)	2.0130	6799.9
5.000 (5.176)	2.3042	1683.4 (1700.4)	883.1	0.06305 (0.06285)	1.9679	6941.6
4.000 (4.149)	2.5825	1637.1 (1644.3)	908.3	0.06200 (0.06181)	1.9126	7110.4
3.000 (3.109)	3.0113	1580.0 (1577.3)	938.7	0.06072 (0.06057)	1.8415	7321.0
2.000 (2.059)	3.7901	1505.6 (1492.1)	977.2	0.05911 (0.05901)	1.7422	7605.5
1.000 (1.016)	5.8020	1387.7 (1370.4)	1037.4	0.05659 (0.05666)	1.5804	8056.5
0.800 (0.808)	6.7215	1353.8 (1336.4)	1054.6	0.05588 (0.05596)	1.5308	8194.5
0.600 (0.602)	8.1770	1310.7 (1296.0)	1076.4	0.05496 (0.05508)	1.4698	8367.1
0.500 (0.500)	9.2945	1284.0 (1272.0)	1090.0	0.05439 (0.05454)	1.4329	8473.9
0.400 (0.398)	10.9238	1252.4 (1244.0)	1106.1	0.05372 (0.05389)	1.3896	8602.5
0.300 (0.297)	13.5459	1212.9 (1209.9)	1126.5	0.05287 (0.05306)	1.3376	8764.9
0.200 (0.196)	18.6371	1164.0 (1163.9)	1153.9	0.05172 (0.05191)	1.2718	8990.3
0.100 (0.097)	32.9687	1082.0 (1088.9)	1200.4	0.04977 (0.04997)	1.1863	9359.3
0.080 (0.078)	39.8357	1057.0 (1064.7)	1214.3	0.04919 (0.04935)	1.1665	9474.6
0.060 (0.059)	50.9159	1024.8 (1033.2)	1232.0	0.04845 (0.04856)	1.1469	9620.2
0.050 (0.049)	59.5239	1004.6 (1013.0)	1243.0	0.04799 (0.04807)	1.1378	9711.0
0.040 (0.040)	72.1114	980.2 (987.8)	1256.1	0.04745 (0.04747)	1.1302	9820.7
0.030 (0.030)	92.3791	949.0 (955.0)	1272.4	0.04676 (0.04672)	1.1260	9960.0
0.020 (0.020)	130.9529	905.3 (907.8)	1294.4	0.04584 (0.04571)	1.1301	10152.5
0.010 (0.010)	237.0790	830.7 (826.8)	1329.3	0.04438 (0.04414)	1.1621	10472.1
0.008 (0.008)	286.7444	806.7 (801.3)	1339.6	0.04395 (0.04370)	1.1785	10572.6
0.006 (0.006)	365.8818	775.5 (769.2)	1352.5	0.04341 (0.04319)	1.2035	10700.1
0.005 (0.005)	426.6646	755.6 (749.6)	1360.4	0.04308 (0.04290)	1.2215	10779.5
0.004 (0.004)	514.5134	731.2 (726.5)	1369.7	0.04269 (0.04259)	1.2456	10875.3
0.003 (0.003)	652.6484	698.2 (698.6)	1381.6	0.04219 (0.04228)	1.2794	10995.3
0.002 (0.002)	913.5940	654.2 (662.7)	1396.5	0.04157 (0.04201)	1.3331	11160.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

PBX 9407 RDX94/EXON 6 RHO = 1.6100 G/CC EO = 5.325121E+03 CAL/MOLE

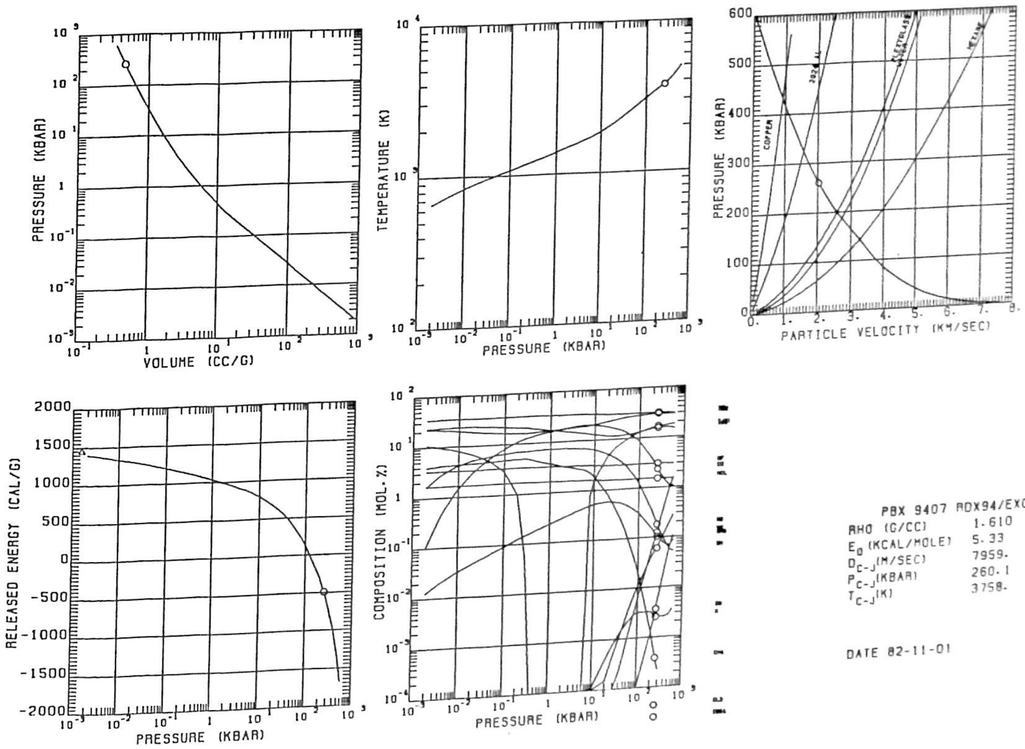
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 CLF	H2 C(S)	O2	NH3	OH	H	CH4	NO	HCL
260.106	1.19373	0.62209	0.09354	1.26501	0.00000	0.00729	0.00015	0.00417	0.00244	0.00010	0.00002	0.00501	0.06101
	0.00000	0.12194	0.00000	0.00000	0.00000	0.67585							
200.000	1.18473	0.60186	0.14656	1.26540	0.00000	0.01378	0.00005	0.00602	0.00172	0.00013	0.00005	0.00236	0.06101
	0.00000	0.12194	0.00000	0.00000	0.00000	0.64302							
100.000	1.13819	0.53259	0.33512	1.26319	0.00000	0.04967	0.00000	0.01257	0.00046	0.00013	0.00079	0.00025	0.06102
	0.00000	0.12195	0.00000	0.00000	0.00000	0.52300							
80.000	1.11460	0.51058	0.40305	1.26206	0.00000	0.06813	0.00000	0.01496	0.00027	0.00011	0.00161	0.00011	0.06102
	0.00000	0.12195	0.00000	0.00000	0.00000	0.47626							
60.000	1.07877	0.48746	0.48539	1.26067	0.00000	0.09569	0.00000	0.01781	0.00013	0.00009	0.00364	0.00004	0.06103
	0.00000	0.12195	0.00000	0.00000	0.00000	0.41501							
50.000	1.05323	0.47635	0.53320	1.25990	0.00000	0.11466	0.00000	0.01938	0.00008	0.00007	0.00577	0.00002	0.06103
	0.00000	0.12195	0.00000	0.00000	0.00000	0.37617							
40.000	1.01923	0.46664	0.58668	1.25911	0.00000	0.13864	0.00000	0.02096	0.00004	0.00005	0.00961	0.00001	0.06103
	0.00000	0.12196	0.00000	0.00000	0.00000	0.32855							
30.000	0.97395	0.44098	0.64332	1.25854	0.00000	0.16832	0.00000	0.02211	0.00002	0.00003	0.01655	0.00000	0.06104
	0.00000	0.12196	0.00000	0.00000	0.00000	0.27063							
20.000	0.90369	0.44429	0.70699	1.25827	0.00000	0.20585	0.00000	0.02265	0.00001	0.00002	0.03251	0.00000	0.06104
	0.00000	0.12197	0.00000	0.00000	0.00000	0.18771							
10.000	0.78715	0.49355	0.76501	1.25942	0.00000	0.24769	0.00000	0.02035	0.00000	0.00000	0.07159	0.00000	0.06106
	0.00000	0.12198	0.00000	0.00000	0.00000	0.06136							
8.000	0.75459	0.50787	0.76889	1.26005	0.00000	0.25469	0.00000	0.01909	0.00000	0.00000	0.08531	0.00000	0.06106
	0.00000	0.12199	0.00000	0.00000	0.00000	0.02943							
6.000	0.72123	0.52635	0.76529	1.26092	0.00000	0.26167	0.00000	0.01735	0.00000	0.00000	0.09980	0.00000	0.06106
	0.00000	0.12199	0.00000	0.00000	0.00000	0.0							
5.000	0.71360	0.53637	0.75288	1.26150	0.00000	0.26620	0.00000	0.01619	0.00000	0.00000	0.10222	0.00000	0.06107
	0.00000	0.12199	0.00000	0.00000	0.00000	0.0							
4.000	0.70400	0.54960	0.73602	1.26215	0.00000	0.27050	0.00000	0.01489	0.00000	0.00000	0.10585	0.00000	0.06107
	0.00000	0.12200	0.00000	0.00000	0.00000	0.0							
3.000	0.69131	0.56791	0.71211	1.26292	0.00000	0.27427	0.00000	0.01336	0.00000	0.00000	0.11145	0.00000	0.06107
	0.00000	0.12200	0.00000	0.00000	0.00000	0.0							
2.000	0.67332	0.59475	0.67641	1.26387	0.00000	0.27738	0.00000	0.01146	0.00000	0.00000	0.12031	0.00000	0.06108
	0.00000	0.12201	0.00000	0.00000	0.00000	0.0							
1.000	0.64065	0.64746	0.60367	1.26521	0.00000	0.27396	0.00000	0.00878	0.00000	0.00000	0.14036	0.00000	0.06109
	0.00000	0.12202	0.00000	0.00000	0.00000	0.0							
0.800	0.63039	0.66430	0.58026	1.26558	0.00000	0.27217	0.00000	0.00805	0.00000	0.00000	0.14693	0.00000	0.06110
	0.00000	0.12203	0.00000	0.00000	0.00000	0.0							
0.600	0.61668	0.68751	0.54755	1.26601	0.00000	0.26818	0.00000	0.00718	0.00000	0.00000	0.15643	0.00000	0.06110
	0.00000	0.12203	0.00000	0.00000	0.00000	0.0							
0.500	0.60782	0.70290	0.52564	1.26627	0.00000	0.26481	0.00000	0.00666	0.00000	0.00000	0.16293	0.00000	0.06110
	0.00000	0.12204	0.00000	0.00000	0.00000	0.0							
0.400	0.59704	0.72168	0.49886	1.26657	0.00000	0.26047	0.00000	0.00607	0.00000	0.00000	0.17094	0.00000	0.06111
	0.00000	0.12204	0.00000	0.00000	0.00000	0.0							
0.300	0.58457	0.74620	0.46229	1.26692	0.00000	0.25411	0.00000	0.00537	0.00000	0.00000	0.18087	0.00000	0.06112
	0.00000	0.12205	0.00000	0.00000	0.00000	0.00214							
0.200	0.59173	0.77204	0.40345	1.26733	0.00000	0.24986	0.00000	0.00455	0.00000	0.00000	0.18003	0.00000	0.06112
	0.00000	0.12206	0.00000	0.00000	0.00000	0.03596							
0.100	0.61358	0.81345	0.29879	1.26791	0.00000	0.23769	0.00000	0.00339	0.00000	0.00000	0.17605	0.00000	0.06114
	0.00000	0.12208	0.00000	0.00000	0.00000	0.10323							
0.080	0.62172	0.82467	0.26822	1.26806	0.00000	0.23336	0.00000	0.00308	0.00000	0.00000	0.17438	0.00000	0.06114
	0.00000	0.12208	0.00000	0.00000	0.00000	0.12422							
0.060	0.63346	0.83813	0.22957	1.26825	0.00000	0.22648	0.00000	0.00272	0.00000	0.00000	0.17222	0.00000	0.06115

	0.00000	0.12209	0.00000	0.00000	0.00000	0.15158							
0.050	0.64144	0.84586	0.20613	1.26835	0.00000	0.22147	0.00000	0.00251	0.00000	0.00000	0.17089	0.00000	0.06116
	0.00000	0.12209	0.00000	0.00000	0.00000	0.16864							
0.040	0.65163	0.85427	0.17912	1.26847	0.00000	0.21480	0.00000	0.00227	0.00000	0.00000	0.16930	0.00000	0.06116
	0.00000	0.12210	0.00000	0.00000	0.00000	0.18884							
0.030	0.66561	0.86342	0.14685	1.26861	0.00000	0.20507	0.00000	0.00200	0.00000	0.00000	0.16738	0.00000	0.06117
	0.00000	0.12211	0.00000	0.00000	0.00000	0.21388							
0.020	0.68701	0.87282	0.10667	1.26878	0.00000	0.18899	0.00000	0.00166	0.00000	0.00000	0.16496	0.00000	0.06118
	0.00000	0.12212	0.00000	0.00000	0.00000	0.24707							
0.010	0.72881	0.87830	0.05391	1.26901	0.00000	0.15499	0.00000	0.00119	0.00000	0.00000	0.16140	0.00000	0.06120
	0.00000	0.12215	0.00000	0.00000	0.00000	0.29792							
0.008	0.74356	0.87711	0.04154	1.26907	0.00000	0.14279	0.00000	0.00107	0.00000	0.00000	0.16022	0.00000	0.06121
	0.00000	0.12215	0.00000	0.00000	0.00000	0.31267							
0.006	0.76389	0.87349	0.02847	1.26915	0.00000	0.12600	0.00000	0.00092	0.00000	0.00000	0.15856	0.00000	0.06122
	0.00000	0.12217	0.00000	0.00000	0.00000	0.33102							
0.005	0.77749	0.87000	0.02185	1.26919	0.00000	0.11501	0.00000	0.00083	0.00000	0.00000	0.15731	0.00000	0.06123
	0.00000	0.12218	0.00000	0.00000	0.00000	0.34238							
0.004	0.79476	0.86461	0.01537	1.26924	0.00000	0.10149	0.00000	0.00074	0.00000	0.00000	0.15551	0.00000	0.06124
	0.00000	0.12218	0.00000	0.00000	0.00000	0.35606							
0.003	0.81940	0.85548	0.00900	1.26930	0.00000	0.08302	0.00000	0.00062	0.00000	0.00000	0.15250	0.00000	0.06125
	0.00000	0.12220	0.00000	0.00000	0.00000	0.37456							
0.002	0.85359	0.84089	0.00400	1.26938	0.00000	0.06078	0.00000	0.00048	0.00000	0.00000	0.14663	0.00000	0.06127
	0.00000	0.12222	0.00000	0.00000	0.00000	0.40002							
300.000	1.19595	0.62698	0.07734	1.26371	0.00000	0.00550	0.00029	0.00364	0.00322	0.00010	0.00001	0.00813	0.06101
	0.00000	0.12194	0.00000	0.00000	0.00000	0.68716							
400.000	1.19817	0.62947	0.05386	1.25782	0.00000	0.00320	0.00108	0.00295	0.00546	0.00010	0.00000	0.02060	0.06101
	0.00000	0.12194	0.00000	0.00000	0.00000	0.70816							
500.000	1.19791	0.62200	0.04357	1.24804	0.00000	0.00230	0.00266	0.00284	0.00812	0.00011	0.00000	0.04027	0.06101
	0.00000	0.12194	0.00000	0.00000	0.00000	0.72592							
600.000	1.19551	0.60859	0.04364	1.23635	0.00000	0.00213	0.00442	0.00355	0.01108	0.00014	0.00000	0.06294	0.06101
	0.00000	0.12193	0.00000	0.00000	0.00000	0.73925							

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



PBX 9407 RDX94/EXON 6

RHO (G/CC)	1.610
E_0 (KCAL/MOLE)	5.33
D_{C-J} (M/SEC)	7959.
P_{C-J} (KBAR)	260.1
T_{C-J} (K)	3758.

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

X-0219 TATB 90/KEL-F 10 RHO = 1.9140 G/CC EO = -1.995433E+04 CAL/MOLE

LN P = -3.85715580 E+00 -2.45154381 E+00LN V 3.47422421 E-01LN V*2 -3.57349701 E-02LN V*3 1.01183983 E-03LN V*4

LN T = 7.51167679 E+00 -3.84341538 E-01LN V 1.14380062 E-01LN V*2 -2.07834654 E-02LN V*3 1.24807912 E-03LN V*4

LN E = -1.68965054 E+00 4.11505640 E-01LNP 6.96628690 E-02LN P*2 5.59699535 E-03LN P*3 1.64955840 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (684.489)	0.3036	3852.4 (3533.2)	-1416.4	0.15926 (0.15222)	3.4389	319.1
500.000 (525.314)	0.3282	3427.5 (3336.9)	-1075.8	0.14501 (0.14324)	3.3643	817.7
400.000 (402.145)	0.3557	3086.2 (3151.4)	-769.9	0.13221 (0.13367)	3.2889	1344.3
300.000 (294.232)	0.3916	2769.6 (2953.0)	-468.9	0.11962 (0.12325)	3.2005	1944.0
* 297.122 (291.303)	0.3928	2760.0 (2947.0)	-460.0	0.11924 (0.12293)	3.1976	1962.6
200.000 (189.164)	0.4508	2623.1 (2701.2)	-226.4	0.10947 (0.11150)	3.0752	2729.2
100.000 (93.418)	0.5715	2373.4 (2359.6)	76.2	0.09681 (0.09715)	2.8745	3793.0
80.000 (75.045)	0.6173	2292.3 (2266.7)	151.6	0.09366 (0.09366)	2.8121	4082.7
60.000 (56.831)	0.6824	2187.4 (2156.9)	237.1	0.09008 (0.08979)	2.7329	4426.5
50.000 (47.731)	0.7278	2122.1 (2092.2)	285.1	0.08807 (0.08765)	2.6832	4629.6
40.000 (38.601)	0.7885	2043.9 (2017.8)	338.1	0.08585 (0.08531)	2.6228	4864.7
30.000 (28.689)	0.8846	1948.7 (1920.9)	396.9	0.08339 (0.08271)	2.5384	5172.7
20.000 (19.730)	1.0284	1822.7 (1809.8)	468.6	0.08039 (0.07967)	2.4321	5530.5
10.000 (10.281)	1.3590	1640.4 (1642.5)	563.3	0.07643 (0.07579)	2.2484	6083.5
8.000 (8.317)	1.4952	1588.5 (1594.4)	589.2	0.07535 (0.07481)	2.1891	6246.9
6.000 (6.298)	1.7017	1528.3 (1535.6)	618.7	0.07411 (0.07368)	2.1118	6450.6
5.000 (5.266)	1.8541	1493.4 (1500.1)	635.6	0.07341 (0.07303)	2.0625	6575.9
4.000 (4.223)	2.0668	1452.7 (1458.7)	655.4	0.07258 (0.07231)	2.0020	6724.7
3.000 (3.157)	2.3969	1406.0 (1408.0)	677.7	0.07165 (0.07146)	1.9233	6911.8
2.000 (2.088)	2.9911	1343.7 (1342.6)	707.8	0.07039 (0.07038)	1.8136	7162.6
1.000 (1.021)	4.5333	1249.8 (1244.9)	753.4	0.06848 (0.06874)	1.6323	7561.8
0.800 (0.810)	5.2353	1222.2 (1216.8)	766.8	0.06792 (0.06824)	1.5767	7683.2
0.600 (0.602)	6.3495	1187.8 (1182.5)	783.6	0.06722 (0.06761)	1.5079	7835.2
0.500 (0.499)	7.2068	1166.6 (1161.7)	793.9	0.06678 (0.06720)	1.4662	7929.2
0.400 (0.396)	8.4557	1141.0 (1137.0)	806.2	0.06627 (0.06671)	1.4174	8042.1
0.300 (0.294)	10.4701	1108.6 (1106.2)	821.8	0.06562 (0.06607)	1.3586	8184.7
0.200 (0.194)	14.3439	1063.4 (1063.7)	843.2	0.06472 (0.06515)	1.2849	8380.4
0.100 (0.097)	25.2842	986.7 (991.3)	878.5	0.06324 (0.06353)	1.1892	8701.3
0.080 (0.077)	30.5075	962.3 (967.5)	889.3	0.06279 (0.06301)	1.1674	8801.2
0.060 (0.058)	38.9392	930.9 (936.3)	903.0	0.06222 (0.06233)	1.1459	8927.4
0.050 (0.049)	45.4848	910.9 (916.1)	911.4	0.06187 (0.06190)	1.1361	9006.1
0.040 (0.039)	55.0400	886.7 (891.2)	921.5	0.06145 (0.06138)	1.1282	9101.2
0.030 (0.030)	70.3959	855.4 (858.6)	934.0	0.06092 (0.06074)	1.1241	9221.8
0.020 (0.020)	99.5400	811.6 (812.2)	950.8	0.06022 (0.05987)	1.1298	9388.6
0.010 (0.010)	179.3433	736.8 (733.7)	977.4	0.05911 (0.05862)	1.1671	9665.6
0.008 (0.008)	216.5141	713.0 (709.2)	985.4	0.05877 (0.05830)	1.1857	9752.7
0.006 (0.006)	275.8992	682.8 (678.7)	995.1	0.05837 (0.05797)	1.2141	9863.6
0.005 (0.005)	321.6438	664.1 (660.1)	1000.9	0.05812 (0.05782)	1.2344	9933.0
0.004 (0.004)	387.6853	641.2 (638.2)	1008.0	0.05783 (0.05769)	1.2615	10016.7
0.003 (0.003)	492.7893	612.1 (611.8)	1016.6	0.05747 (0.05765)	1.2999	10122.5
0.002 (0.002)	689.8337	572.1 (578.5)	1028.0	0.05699 (0.05786)	1.3598	10267.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

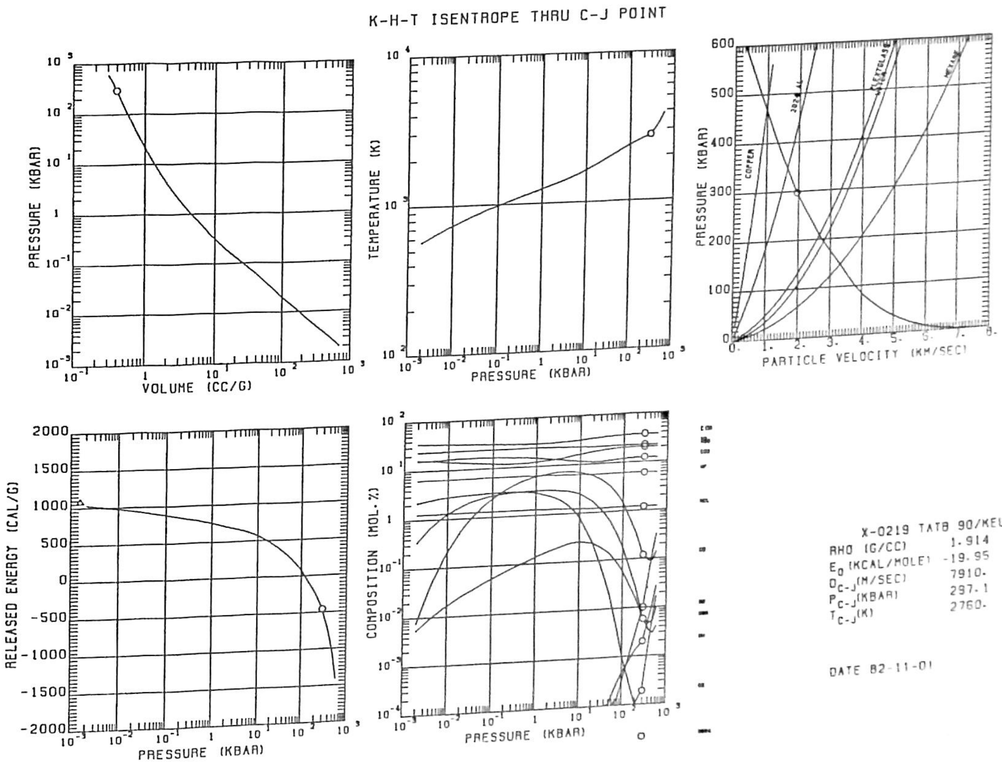
X-0219 TATB 90/KEL-F 10 RHO = 1.9140 G/CC EO = -1.995433E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O / CCL4	CO2 / HF	CO / F2	N2 / CL2	CF4 / CLF	H2 / C(S)	O2	NH3	OH	H	CH4	NO	HCL
297.122	0.93427	0.57572	0.00550	1.04553	0.00000	0.00027	0.00001	0.00027	0.00009	0.00000	0.00000	0.00047	0.05552
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73223							
200.000	0.93273	0.57124	0.01639	1.04548	0.00000	0.00117	0.00000	0.00071	0.00006	0.00000	0.00000	0.00013	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.72581							
100.000	0.92281	0.55138	0.06619	1.04458	0.00000	0.00815	0.00000	0.00262	0.00002	0.00000	0.00005	0.00001	0.05551
	0.00000	0.27711	0.00000	0.00000	0.00000	1.69582							
80.000	0.91613	0.54196	0.09174	1.04409	0.00000	0.01316	0.00000	0.00362	0.00001	0.00000	0.00013	0.00001	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.67961							
60.000	0.90418	0.52941	0.12880	1.04333	0.00000	0.02221	0.00000	0.00513	0.00001	0.00000	0.00045	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.65479							
50.000	0.89445	0.52190	0.15355	1.04281	0.00000	0.02951	0.00000	0.00617	0.00000	0.00000	0.00089	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.63710							
40.000	0.88011	0.51403	0.18363	1.04217	0.00000	0.03992	0.00000	0.00746	0.00000	0.00000	0.00188	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.61389							
30.000	0.85819	0.50723	0.21916	1.04142	0.00000	0.05491	0.00000	0.00895	0.00000	0.00000	0.00423	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.58281							
20.000	0.81815	0.50490	0.26388	1.04053	0.00000	0.07797	0.00000	0.01074	0.00000	0.00000	0.01137	0.00000	0.05553
	0.00000	0.27712	0.00000	0.00000	0.00000	1.53330							
10.000	0.73382	0.52228	0.31345	1.04008	0.00000	0.11155	0.00000	0.01165	0.00000	0.00000	0.03606	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	1.44165							
8.000	0.70646	0.53284	0.31969	1.04022	0.00000	0.11869	0.00000	0.01137	0.00000	0.00000	0.04638	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	1.41452							
6.000	0.67195	0.54767	0.32456	1.04051	0.00000	0.12609	0.00000	0.01078	0.00000	0.00000	0.06038	0.00000	0.05555
	0.00000	0.27713	0.00000	0.00000	0.00000	1.38084							
5.000	0.65131	0.55740	0.32574	1.04075	0.00000	0.12981	0.00000	0.01031	0.00000	0.00000	0.06919	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	1.36111							
4.000	0.62852	0.56994	0.32345	1.04107	0.00000	0.13302	0.00000	0.00967	0.00000	0.00000	0.07945	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	1.34061							
3.000	0.60170	0.58506	0.32002	1.04149	0.00000	0.13668	0.00000	0.00883	0.00000	0.00000	0.09166	0.00000	0.05556
	0.00000	0.27714	0.00000	0.00000	0.00000	1.31670							
2.000	0.57248	0.60708	0.30521	1.04208	0.00000	0.13888	0.00000	0.00766	0.00000	0.00000	0.10605	0.00000	0.05556
	0.00000	0.27715	0.00000	0.00000	0.00000	1.29510							
1.000	0.53970	0.64210	0.26795	1.04295	0.00000	0.13913	0.00000	0.00591	0.00000	0.00000	0.12362	0.00000	0.05557
	0.00000	0.27716	0.00000	0.00000	0.00000	1.27978							
0.800	0.53299	0.65246	0.25397	1.04319	0.00000	0.13859	0.00000	0.00543	0.00000	0.00000	0.12760	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	1.27943							
0.600	0.52688	0.66518	0.23462	1.04347	0.00000	0.13745	0.00000	0.00487	0.00000	0.00000	0.13165	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	1.28200							
0.500	0.52443	0.67285	0.22173	1.04364	0.00000	0.13645	0.00000	0.00453	0.00000	0.00000	0.13362	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	1.28525							
0.400	0.52280	0.68176	0.20555	1.04383	0.00000	0.13500	0.00000	0.00415	0.00000	0.00000	0.13544	0.00000	0.05559
	0.00000	0.27719	0.00000	0.00000	0.00000	1.29071							
0.300	0.52284	0.69246	0.18412	1.04405	0.00000	0.13268	0.00000	0.00370	0.00000	0.00000	0.13692	0.00000	0.05560
	0.00000	0.27719	0.00000	0.00000	0.00000	1.29995							
0.200	0.52671	0.70585	0.15347	1.04434	0.00000	0.12841	0.00000	0.00313	0.00000	0.00000	0.13754	0.00000	0.05561
	0.00000	0.27720	0.00000	0.00000	0.00000	1.31659							
0.100	0.54172	0.72347	0.10324	1.04475	0.00000	0.11791	0.00000	0.00232	0.00000	0.00000	0.13588	0.00000	0.05563
	0.00000	0.27723	0.00000	0.00000	0.00000	1.35088							
0.080	0.54821	0.72748	0.08873	1.04486	0.00000	0.11371	0.00000	0.00210	0.00000	0.00000	0.13490	0.00000	0.05563
	0.00000	0.27724	0.00000	0.00000	0.00000	1.36234							
0.060	0.55762	0.73144	0.07141	1.04499	0.00000	0.10754	0.00000	0.00184	0.00000	0.00000	0.13347	0.00000	0.05564

	0.00000	0.27726	0.00000	0.00000	0.00000	1.37714							
0.050	0.56414	0.73319	0.06140	1.04506	0.00000	0.10320	0.00000	0.00169	0.00000	0.00000	0.13249	0.00000	0.05565
	0.00000	0.27727	0.00000	0.00000	0.00000	1.38638							
0.040	0.57258	0.73451	0.05032	1.04515	0.00000	0.09754	0.00000	0.00152	0.00000	0.00000	0.13122	0.00000	0.05565
	0.00000	0.27727	0.00000	0.00000	0.00000	1.39742							
0.030	0.58424	0.73488	0.03792	1.04525	0.00000	0.08963	0.00000	0.00132	0.00000	0.00000	0.12948	0.00000	0.05566
	0.00000	0.27731	0.00000	0.00000	0.00000	1.41118							
0.020	0.60208	0.73289	0.02407	1.04537	0.00000	0.07758	0.00000	0.00107	0.00000	0.00000	0.12678	0.00000	0.05568
	0.00000	0.27730	0.00000	0.00000	0.00000	1.42973							
0.010	0.63638	0.72318	0.00921	1.04555	0.00000	0.05554	0.00000	0.00073	0.00000	0.00000	0.12088	0.00000	0.05570
	0.00000	0.27736	0.00000	0.00000	0.00000	1.46021							
0.008	0.64831	0.71863	0.00640	1.04559	0.00000	0.04857	0.00000	0.00064	0.00000	0.00000	0.11847	0.00000	0.05571
	0.00000	0.27737	0.00000	0.00000	0.00000	1.47000							
0.006	0.66406	0.71203	0.00386	1.04565	0.00000	0.04013	0.00000	0.00053	0.00000	0.00000	0.11489	0.00000	0.05572
	0.00000	0.27737	0.00000	0.00000	0.00000	1.48271							
0.005	0.67419	0.70752	0.00274	1.04568	0.00000	0.03519	0.00000	0.00048	0.00000	0.00000	0.11233	0.00000	0.05573
	0.00000	0.27740	0.00000	0.00000	0.00000	1.49090							
0.004	0.68706	0.70159	0.00174	1.04571	0.00000	0.02943	0.00000	0.00041	0.00000	0.00000	0.10882	0.00000	0.05574
	0.00000	0.27744	0.00000	0.00000	0.00000	1.50135							
0.003	0.70406	0.69351	0.00092	1.04575	0.00000	0.02281	0.00000	0.00033	0.00000	0.00000	0.10369	0.00000	0.05576
	0.00000	0.27744	0.00000	0.00000	0.00000	1.51538							
0.002	0.72872	0.68148	0.00034	1.04580	0.00000	0.01511	0.00000	0.00024	0.00000	0.00000	0.09526	0.00000	0.05578
	0.00000	0.27744	0.00000	0.00000	0.00000	1.53642							
300.000	0.93428	0.57573	0.00545	1.04552	0.00000	0.00026	0.00001	0.00027	0.00010	0.00000	0.00000	0.00049	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.73227							
400.000	0.93438	0.57532	0.00422	1.04471	0.00000	0.00016	0.00007	0.00022	0.00026	0.00000	0.00000	0.00216	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73391							
500.000	0.93420	0.57278	0.00428	1.04250	0.00000	0.00013	0.00030	0.00024	0.00059	0.00000	0.00000	0.00656	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73639							
600.000	0.93351	0.56706	0.00647	1.03823	0.00000	0.00019	0.00077	0.00044	0.00128	0.00000	0.00000	0.01489	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.73992							

PRESS ;KBAR, PRODUCTS ;MOLES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

X-0219 TATB 90/KEL-F 10 RHO = 1.9140 G/CC EO = -1.995433E+04 CAL/MOLE

LN P = -3.85715580 E+00 -2.45154381 E+00LN V 3.47422421 E-01LN V*2 -3.57349701 E-02LN V*3 1.01183983 E-03LN V*4

LN T = 7.51167679 E+00 -3.84341538 E-01LN V 1.14380062 E-01LN V*2 -2.07834654 E-02LN V*3 1.24807912 E-03LN V*4

LN E = -1.68965054 E+00 4.11505640 E-01LNP 6.96628690 E-02LN P*2 5.59699535 E-03LN P*3 1.64955840 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (684.489)	0.3036	3852.4 (3533.2)	-1416.4	0.15926 (0.15222)	3.4389	319.1
500.000 (525.314)	0.3282	3427.5 (3335.9)	-1075.8	0.14501 (0.14324)	3.3643	817.7
400.000 (402.145)	0.3557	3086.2 (3151.4)	-769.9	0.13221 (0.13367)	3.2889	1344.3
300.000 (294.232)	0.3916	2769.6 (2953.0)	-468.9	0.11962 (0.12325)	3.2005	1944.0
* 297.122 (291.303)	0.3928	2760.0 (2947.0)	-460.0	0.11924 (0.12293)	3.1976	1962.6
200.000 (189.164)	0.4508	2623.1 (2701.2)	-226.4	0.10947 (0.11150)	3.0752	2729.2
100.000 (93.418)	0.5715	2373.4 (2359.6)	76.2	0.09681 (0.09715)	2.8745	3793.0
80.000 (75.045)	0.6173	2292.3 (2266.7)	151.6	0.09366 (0.09366)	2.8121	4082.7
60.000 (56.831)	0.6824	2187.4 (2156.9)	237.1	0.09008 (0.08979)	2.7329	4426.5
50.000 (47.731)	0.7278	2122.1 (2092.2)	285.1	0.08807 (0.08765)	2.6832	4629.6
40.000 (38.601)	0.7885	2043.9 (2017.8)	338.1	0.08585 (0.08531)	2.6228	4864.7
30.000 (28.689)	0.8846	1948.7 (1920.9)	396.9	0.08339 (0.08271)	2.5384	5172.7
20.000 (19.730)	1.0284	1822.7 (1809.8)	468.6	0.08039 (0.07967)	2.4321	5530.5
10.000 (10.281)	1.3590	1640.4 (1642.5)	563.3	0.07643 (0.07579)	2.2484	6083.5
8.000 (8.317)	1.4952	1588.5 (1594.4)	589.2	0.07535 (0.07481)	2.1891	6246.9
6.000 (6.298)	1.7017	1528.3 (1535.6)	618.7	0.07411 (0.07368)	2.1118	6450.6
5.000 (5.266)	1.8541	1493.4 (1500.1)	635.6	0.07341 (0.07303)	2.0625	6575.9
4.000 (4.223)	2.0668	1452.7 (1458.7)	655.4	0.07258 (0.07231)	2.0020	6724.7
3.000 (3.157)	2.3969	1406.0 (1408.0)	677.7	0.07165 (0.07146)	1.9233	6911.8
2.000 (2.088)	2.9911	1343.7 (1342.6)	707.8	0.07039 (0.07038)	1.8136	7162.6
1.000 (1.021)	4.5333	1249.8 (1244.9)	753.4	0.06848 (0.06874)	1.6323	7561.8
0.800 (0.810)	5.2353	1222.2 (1216.8)	766.8	0.06792 (0.06824)	1.5767	7683.2
0.600 (0.602)	6.3495	1187.8 (1182.5)	783.6	0.06722 (0.06761)	1.5079	7835.2
0.500 (0.499)	7.2068	1166.6 (1161.7)	793.9	0.06678 (0.06720)	1.4662	7929.2
0.400 (0.396)	8.4557	1141.0 (1137.0)	806.2	0.06627 (0.06671)	1.4174	8042.1
0.300 (0.294)	10.4701	1108.6 (1106.2)	821.8	0.06562 (0.06607)	1.3586	8184.7
0.200 (0.194)	14.3439	1063.4 (1063.7)	843.2	0.06472 (0.06515)	1.2849	8380.4
0.100 (0.097)	25.2842	986.7 (991.3)	878.5	0.06324 (0.06353)	1.1892	8701.3
0.080 (0.077)	30.5075	962.3 (967.5)	889.3	0.06279 (0.06301)	1.1674	8801.2
0.060 (0.058)	38.9392	930.9 (936.3)	903.0	0.06222 (0.06233)	1.1459	8927.4
0.050 (0.049)	45.4848	910.9 (916.1)	911.4	0.06187 (0.06190)	1.1361	9006.1
0.040 (0.039)	55.0400	886.7 (891.2)	921.5	0.06145 (0.06138)	1.1282	9101.2
0.030 (0.030)	70.3959	855.4 (858.6)	934.0	0.06092 (0.06074)	1.1241	9221.8
0.020 (0.020)	99.5400	811.6 (812.2)	950.8	0.06022 (0.05987)	1.1298	9388.6
0.010 (0.010)	179.3433	736.8 (733.7)	977.4	0.05911 (0.05862)	1.1671	9665.6
0.008 (0.008)	216.5141	713.0 (709.2)	985.4	0.05877 (0.05830)	1.1857	9752.7
0.006 (0.006)	275.8992	682.8 (678.7)	995.1	0.05837 (0.05797)	1.2141	9863.6
0.005 (0.005)	321.6438	664.1 (660.1)	1000.9	0.05812 (0.05782)	1.2344	9933.0
0.004 (0.004)	387.6853	641.2 (638.2)	1008.0	0.05783 (0.05769)	1.2615	10016.7
0.003 (0.003)	492.7893	612.1 (611.8)	1016.6	0.05747 (0.05765)	1.2999	10122.5
0.002 (0.002)	689.8337	572.1 (578.5)	1028.0	0.05699 (0.05786)	1.3598	10267.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

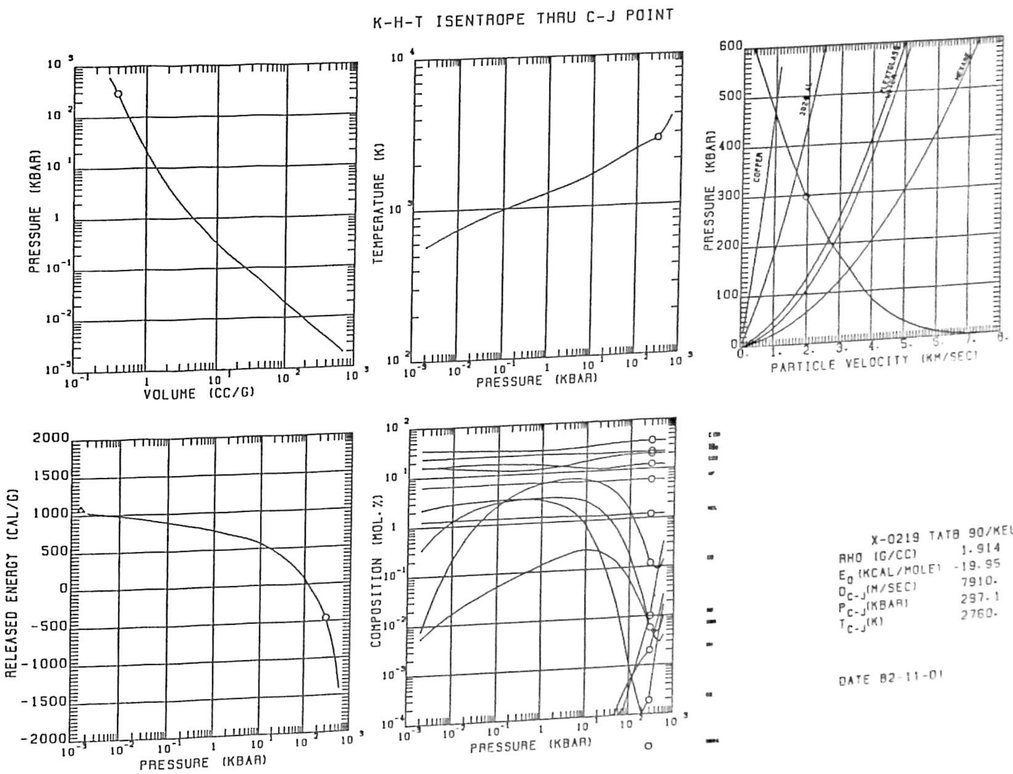
X-0219 TATB 90/KEL-F 10 RHO = 1.9140 G/CC EO = -1.995433E+04 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	CF4	H2	O2	NH3	OH	H	CH4	NO	HCL
	CCL4	HF	F2	CL2	CLF	C(S)							
297.122	0.93427	0.57572	0.00550	1.04553	0.00000	0.00027	0.00001	0.00027	0.00009	0.00000	0.00000	0.00047	0.05552
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73223							
200.000	0.93273	0.57124	0.01639	1.04548	0.00000	0.00117	0.00000	0.00071	0.00006	0.00000	0.00000	0.00013	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.72581							
100.000	0.92281	0.55138	0.06619	1.04458	0.00000	0.00815	0.00000	0.00262	0.00002	0.00000	0.00005	0.00001	0.05551
	0.00000	0.27711	0.00000	0.00000	0.00000	1.69582							
80.000	0.91613	0.54196	0.09174	1.04409	0.00000	0.01316	0.00000	0.00362	0.00001	0.00000	0.00013	0.00001	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.67961							
60.000	0.90418	0.52941	0.12880	1.04333	0.00000	0.02221	0.00000	0.00513	0.00001	0.00000	0.00045	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.65479							
50.000	0.89445	0.52190	0.15355	1.04281	0.00000	0.02951	0.00000	0.00617	0.00000	0.00000	0.00089	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.63710							
40.000	0.88011	0.51403	0.18363	1.04217	0.00000	0.03992	0.00000	0.00746	0.00000	0.00000	0.00188	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.61389							
30.000	0.85819	0.50723	0.21916	1.04142	0.00000	0.05491	0.00000	0.00895	0.00000	0.00000	0.00423	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.58281							
20.000	0.81815	0.50490	0.26388	1.04053	0.00000	0.07797	0.00000	0.01074	0.00000	0.00000	0.01137	0.00000	0.05553
	0.00000	0.27712	0.00000	0.00000	0.00000	1.53330							
10.000	0.73382	0.52228	0.31345	1.04008	0.00000	0.11155	0.00000	0.01165	0.00000	0.00000	0.03606	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	1.44165							
8.000	0.70646	0.53284	0.31969	1.04022	0.00000	0.11869	0.00000	0.01137	0.00000	0.00000	0.04638	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	1.41452							
6.000	0.67195	0.54767	0.32456	1.04051	0.00000	0.12609	0.00000	0.01078	0.00000	0.00000	0.06038	0.00000	0.05555
	0.00000	0.27713	0.00000	0.00000	0.00000	1.38084							
5.000	0.65131	0.55740	0.32574	1.04075	0.00000	0.12981	0.00000	0.01031	0.00000	0.00000	0.06919	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	1.36111							
4.000	0.62852	0.56994	0.32345	1.04107	0.00000	0.13302	0.00000	0.00967	0.00000	0.00000	0.07945	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	1.34061							
3.000	0.60170	0.58506	0.32002	1.04149	0.00000	0.13668	0.00000	0.00883	0.00000	0.00000	0.09166	0.00000	0.05556
	0.00000	0.27714	0.00000	0.00000	0.00000	1.31670							
2.000	0.57248	0.60708	0.30521	1.04208	0.00000	0.13888	0.00000	0.00766	0.00000	0.00000	0.10605	0.00000	0.05556
	0.00000	0.27715	0.00000	0.00000	0.00000	1.29510							
1.000	0.53970	0.64210	0.26795	1.04295	0.00000	0.13913	0.00000	0.00591	0.00000	0.00000	0.12362	0.00000	0.05557
	0.00000	0.27716	0.00000	0.00000	0.00000	1.27978							
0.800	0.53299	0.65246	0.25397	1.04319	0.00000	0.13859	0.00000	0.00543	0.00000	0.00000	0.12760	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	1.27943							
0.600	0.52688	0.66518	0.23462	1.04347	0.00000	0.13745	0.00000	0.00487	0.00000	0.00000	0.13165	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	1.28200							
0.500	0.52443	0.67285	0.22173	1.04364	0.00000	0.13645	0.00000	0.00453	0.00000	0.00000	0.13362	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	1.28525							
0.400	0.52280	0.68176	0.20555	1.04383	0.00000	0.13500	0.00000	0.00415	0.00000	0.00000	0.13544	0.00000	0.05559
	0.00000	0.27719	0.00000	0.00000	0.00000	1.29071							
0.300	0.52284	0.69246	0.18412	1.04405	0.00000	0.13268	0.00000	0.00370	0.00000	0.00000	0.13692	0.00000	0.05560
	0.00000	0.27719	0.00000	0.00000	0.00000	1.29995							
0.200	0.52671	0.70585	0.15347	1.04434	0.00000	0.12841	0.00000	0.00313	0.00000	0.00000	0.13754	0.00000	0.05561
	0.00000	0.27720	0.00000	0.00000	0.00000	1.31659							
0.100	0.54172	0.72347	0.10324	1.04475	0.00000	0.11791	0.00000	0.00232	0.00000	0.00000	0.13588	0.00000	0.05563
	0.00000	0.27723	0.00000	0.00000	0.00000	1.35088							
0.080	0.54821	0.72748	0.08873	1.04486	0.00000	0.11371	0.00000	0.00210	0.00000	0.00000	0.13490	0.00000	0.05563
	0.00000	0.27724	0.00000	0.00000	0.00000	1.36234							
0.060	0.55762	0.73144	0.07141	1.04499	0.00000	0.10754	0.00000	0.00184	0.00000	0.00000	0.13347	0.00000	0.05564

	0.00000	0.27726	0.00000	0.00000	0.00000	1.37714							
0.050	0.56414	0.73319	0.06140	1.04506	0.00000	0.10320	0.00000	0.00169	0.00000	0.00000	0.13249	0.00000	0.05565
	0.00000	0.27727	0.00000	0.00000	0.00000	1.38638							
0.040	0.57258	0.73451	0.05032	1.04515	0.00000	0.09754	0.00000	0.00152	0.00000	0.00000	0.13122	0.00000	0.05565
	0.00000	0.27727	0.00000	0.00000	0.00000	1.39742							
0.030	0.58424	0.73488	0.03792	1.04525	0.00000	0.08963	0.00000	0.00132	0.00000	0.00000	0.12948	0.00000	0.05566
	0.00000	0.27731	0.00000	0.00000	0.00000	1.41118							
0.020	0.60208	0.73289	0.02407	1.04537	0.00000	0.07758	0.00000	0.00107	0.00000	0.00000	0.12678	0.00000	0.05568
	0.00000	0.27730	0.00000	0.00000	0.00000	1.42973							
0.010	0.63638	0.72318	0.00921	1.04555	0.00000	0.05554	0.00000	0.00073	0.00000	0.00000	0.12088	0.00000	0.05570
	0.00000	0.27736	0.00000	0.00000	0.00000	1.46021							
0.008	0.64831	0.71863	0.00640	1.04559	0.00000	0.04857	0.00000	0.00064	0.00000	0.00000	0.11847	0.00000	0.05571
	0.00000	0.27737	0.00000	0.00000	0.00000	1.47000							
0.006	0.66406	0.71203	0.00386	1.04565	0.00000	0.04013	0.00000	0.00053	0.00000	0.00000	0.11489	0.00000	0.05572
	0.00000	0.27737	0.00000	0.00000	0.00000	1.48271							
0.005	0.67419	0.70752	0.00274	1.04568	0.00000	0.03519	0.00000	0.00048	0.00000	0.00000	0.11233	0.00000	0.05573
	0.00000	0.27740	0.00000	0.00000	0.00000	1.49090							
0.004	0.68706	0.70159	0.00174	1.04571	0.00000	0.02943	0.00000	0.00041	0.00000	0.00000	0.10882	0.00000	0.05574
	0.00000	0.27744	0.00000	0.00000	0.00000	1.50135							
0.003	0.70406	0.69351	0.00092	1.04575	0.00000	0.02281	0.00000	0.00033	0.00000	0.00000	0.10369	0.00000	0.05576
	0.00000	0.27744	0.00000	0.00000	0.00000	1.51538							
0.002	0.72872	0.68148	0.00034	1.04580	0.00000	0.01511	0.00000	0.00024	0.00000	0.00000	0.09526	0.00000	0.05578
	0.00000	0.27744	0.00000	0.00000	0.00000	1.53642							
300.000	0.93428	0.57573	0.00545	1.04552	0.00000	0.00026	0.00001	0.00027	0.00010	0.00000	0.00000	0.00049	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.73227							
400.000	0.93438	0.57532	0.00422	1.04471	0.00000	0.00016	0.00007	0.00022	0.00026	0.00000	0.00000	0.00216	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73391							
500.000	0.93420	0.57278	0.00428	1.04250	0.00000	0.00013	0.00030	0.00024	0.00059	0.00000	0.00000	0.00656	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.73639							
600.000	0.93351	0.56706	0.00647	1.03823	0.00000	0.00019	0.00077	0.00044	0.00128	0.00000	0.00000	0.01489	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.73992							

PRESS ;KBAR, PRODUCTS ;MOLES



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TATB 45/HMX 45/KEL-F 10 RHO = 1.8980 G/CC EO = -1.141384E+04 CAL/MOLE

LN P = -3.70939064 E+00 -2.44863224 E+00LN V 3.37506831 E-01LN V*2 -3.38976160 E-02LN V*3 9.12172953 E-04LN V*4

LN T = 7.58388996 E+00 -4.14917588 E-01LN V 1.16541743 E-01LN V*2 -1.95149072 E-02LN V*3 1.06523558 E-03LN V*4

LN E = -1.68208408 E+00 4.32438374 E-01LNP 6.96973205 E-02LN P*2 5.44852018 E-03LN P*3 1.57610484 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (658.711)	0.3189	4001.7 (3794.7)	-1364.2	0.15708 (0.15175)	3.3585	550.4
500.000 (520.642)	0.3422	3635.8 (3598.5)	-1040.6	0.14354 (0.14226)	3.2939	1037.1
400.000 (404.679)	0.3697	3324.1 (3402.8)	-737.1	0.13084 (0.13214)	3.2245	1563.6
* 320.964 (320.183)	0.3979	3082.1 (3233.5)	-494.4	0.12068 (0.12353)	3.1600	2035.0
300.000 (297.069)	0.4075	3054.2 (3181.7)	-444.8	0.11861 (0.12113)	3.1393	2183.8
200.000 (191.882)	0.4696	2876.7 (2901.1)	-178.4	0.10746 (0.10870)	3.0185	2989.2
100.000 (94.456)	0.5987	2560.1 (2515.3)	160.1	0.09330 (0.09345)	2.8222	4098.4
80.000 (75.739)	0.6479	2458.2 (2410.3)	244.6	0.08977 (0.08972)	2.7610	4401.8
60.000 (57.147)	0.7186	2328.5 (2285.7)	340.6	0.08575 (0.08556)	2.6829	4763.6
50.000 (47.884)	0.7680	2249.2 (2212.5)	394.3	0.08350 (0.08325)	2.6339	4977.4
40.000 (38.617)	0.8342	2155.7 (2128.3)	453.5	0.08103 (0.08073)	2.5744	5224.7
30.000 (28.891)	0.9353	2043.9 (2022.6)	519.5	0.07826 (0.07788)	2.4942	5537.8
20.000 (19.729)	1.0935	1899.0 (1896.4)	598.8	0.07494 (0.07454)	2.3891	5917.1
10.000 (10.214)	1.4564	1694.6 (1708.5)	703.0	0.07059 (0.07018)	2.2090	6498.4
8.000 (8.258)	1.6055	1637.0 (1655.0)	731.8	0.06938 (0.06906)	2.1514	6669.0
6.000 (6.249)	1.8319	1571.2 (1589.6)	764.2	0.06803 (0.06776)	2.0765	6881.8
5.000 (5.225)	1.9988	1533.2 (1550.3)	782.7	0.06725 (0.06701)	2.0287	7012.4
4.000 (4.182)	2.2341	1491.1 (1504.1)	803.1	0.06640 (0.06616)	1.9698	7168.8
3.000 (3.135)	2.5936	1438.9 (1448.5)	828.7	0.06533 (0.06517)	1.8945	7362.4
2.000 (2.077)	3.2440	1372.4 (1376.4)	861.7	0.06395 (0.06391)	1.7892	7623.5
1.000 (1.019)	4.9300	1273.0 (1269.3)	911.5	0.06186 (0.06200)	1.6158	8039.1
0.800 (0.810)	5.6971	1243.9 (1238.6)	926.1	0.06125 (0.06143)	1.5628	8165.5
0.600 (0.603)	6.9138	1207.8 (1201.3)	944.3	0.06049 (0.06072)	1.4973	8324.0
0.500 (0.499)	7.8498	1185.5 (1178.8)	955.5	0.06002 (0.06027)	1.4576	8422.1
0.400 (0.397)	9.2126	1158.8 (1152.2)	969.0	0.05946 (0.05973)	1.4112	8540.0
0.300 (0.295)	11.4092	1125.0 (1119.2)	985.9	0.05875 (0.05904)	1.3554	8689.0
0.200 (0.195)	15.6278	1077.9 (1074.3)	1009.2	0.05778 (0.05806)	1.2857	8893.4
0.100 (0.097)	27.5078	998.2 (999.2)	1047.4	0.05617 (0.05640)	1.1956	9228.6
0.080 (0.078)	33.1678	972.9 (974.8)	1059.1	0.05569 (0.05586)	1.1752	9332.8
0.060 (0.059)	42.2870	940.2 (943.1)	1073.8	0.05507 (0.05518)	1.1553	9464.5
0.050 (0.049)	49.3550	919.5 (922.7)	1082.9	0.05469 (0.05475)	1.1464	9546.5
0.040 (0.039)	59.6572	894.2 (897.4)	1093.7	0.05424 (0.05423)	1.1394	9645.4
0.030 (0.030)	76.1790	861.6 (864.4)	1107.2	0.05368 (0.05358)	1.1362	9770.8
0.020 (0.020)	107.4359	815.6 (817.1)	1125.2	0.05292 (0.05271)	1.1428	9943.8
0.010 (0.010)	192.4842	736.9 (736.0)	1153.4	0.05174 (0.05141)	1.1807	10229.7
0.008 (0.008)	231.7897	711.3 (710.3)	1161.9	0.05138 (0.05106)	1.1992	10319.0
0.006 (0.006)	294.4763	679.2 (677.7)	1172.2	0.05096 (0.05067)	1.2274	10432.8
0.005 (0.005)	342.6140	659.3 (657.4)	1178.3	0.05070 (0.05047)	1.2476	10503.9
0.004 (0.004)	411.8975	634.9 (633.3)	1185.7	0.05039 (0.05028)	1.2745	10589.4
0.003 (0.003)	521.7190	604.0 (603.4)	1194.7	0.05001 (0.05013)	1.3126	10697.3
0.002 (0.002)	726.4976	561.6 (564.1)	1206.6	0.04952 (0.05012)	1.3721	10844.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

TATB 45/HMX 45/KEL-F 10 RHO = 1.8980 G/CC EO = -1.141384E+04 CAL/MOLE

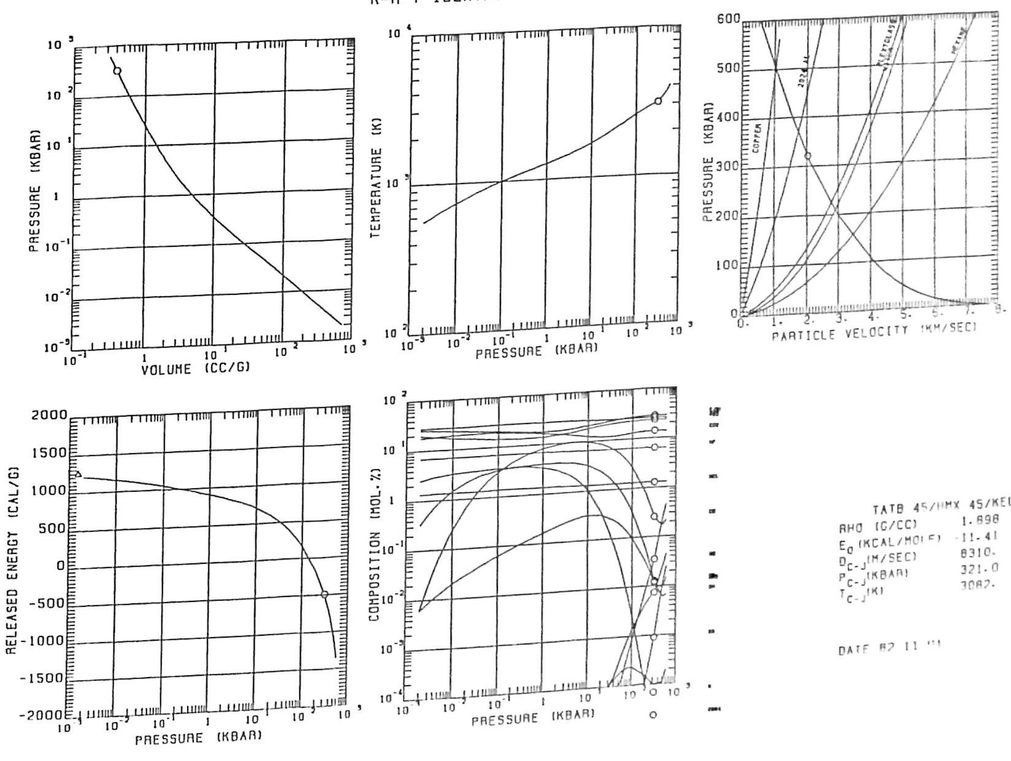
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 CLF	H2 C(S)	O2	NH3	OH	H	CH4	NO	HCL
320.964	1.01837	0.61510	0.01098	1.12972	0.00000	0.00054	0.00004	0.00051	0.00032	0.00000	0.00000	0.00151	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.24924							
300.000	1.01811	0.61430	0.01315	1.12982	0.00000	0.00069	0.00003	0.00059	0.00030	0.00000	0.00000	0.00125	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.24788							
200.000	1.01503	0.60535	0.03518	1.12986	0.00000	0.00263	0.00000	0.00138	0.00019	0.00001	0.00000	0.00036	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.23479							
100.000	0.99857	0.57282	0.11716	1.12860	0.00000	0.01465	0.00000	0.00424	0.00006	0.00001	0.00011	0.00004	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.18523							
80.000	0.98872	0.55970	0.15330	1.12795	0.00000	0.02219	0.00000	0.00555	0.00004	0.00001	0.00028	0.00002	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.16205							
60.000	0.97192	0.54330	0.20294	1.12702	0.00000	0.03508	0.00000	0.00743	0.00002	0.00001	0.00084	0.00001	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.12825							
50.000	0.95880	0.53416	0.23435	1.12641	0.00000	0.04495	0.00000	0.00865	0.00001	0.00001	0.00154	0.00000	0.05551
	0.00000	0.27710	0.00000	0.00000	0.00000	1.10528							
40.000	0.94012	0.52515	0.27106	1.12568	0.00000	0.05850	0.00000	0.01011	0.00001	0.00001	0.00302	0.00000	0.05552
	0.00000	0.27710	0.00000	0.00000	0.00000	1.07610							
30.000	0.91274	0.51819	0.31237	1.12491	0.00000	0.07708	0.00000	0.01165	0.00000	0.00000	0.00626	0.00000	0.05552
	0.00000	0.27711	0.00000	0.00000	0.00000	1.03852							
20.000	0.86497	0.51720	0.36211	1.12406	0.00000	0.10417	0.00000	0.01335	0.00000	0.00000	0.01532	0.00000	0.05553
	0.00000	0.27711	0.00000	0.00000	0.00000	0.98070							
10.000	0.77118	0.53913	0.41205	1.12388	0.00000	0.14061	0.00000	0.01370	0.00000	0.00000	0.04373	0.00000	0.05554
	0.00000	0.27712	0.00000	0.00000	0.00000	0.88042							
8.000	0.74236	0.55177	0.41560	1.12413	0.00000	0.14758	0.00000	0.01322	0.00000	0.00000	0.05502	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	0.85294							
6.000	0.70626	0.56883	0.41758	1.12455	0.00000	0.15476	0.00000	0.01238	0.00000	0.00000	0.07010	0.00000	0.05554
	0.00000	0.27713	0.00000	0.00000	0.00000	0.81880							
5.000	0.68497	0.58002	0.41649	1.12485	0.00000	0.15820	0.00000	0.01178	0.00000	0.00000	0.07948	0.00000	0.05555
	0.00000	0.27713	0.00000	0.00000	0.00000	0.79934							
4.000	0.66050	0.59329	0.41442	1.12524	0.00000	0.16185	0.00000	0.01100	0.00000	0.00000	0.09046	0.00000	0.05555
	0.00000	0.27714	0.00000	0.00000	0.00000	0.77715							
3.000	0.63434	0.61166	0.40387	1.12575	0.00000	0.16419	0.00000	0.00998	0.00000	0.00000	0.10314	0.00000	0.05556
	0.00000	0.27714	0.00000	0.00000	0.00000	0.75666							
2.000	0.60503	0.63711	0.38228	1.12643	0.00000	0.16551	0.00000	0.00861	0.00000	0.00000	0.11816	0.00000	0.05556
	0.00000	0.27715	0.00000	0.00000	0.00000	0.73779							
1.000	0.57290	0.67810	0.33244	1.12743	0.00000	0.16415	0.00000	0.00661	0.00000	0.00000	0.13640	0.00000	0.05558
	0.00000	0.27716	0.00000	0.00000	0.00000	0.72838							
0.800	0.56654	0.69033	0.31434	1.12770	0.00000	0.16312	0.00000	0.00607	0.00000	0.00000	0.14050	0.00000	0.05558
	0.00000	0.27717	0.00000	0.00000	0.00000	0.73015							
0.600	0.56098	0.70549	0.28958	1.12803	0.00000	0.16130	0.00000	0.00543	0.00000	0.00000	0.14467	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	0.73558							
0.500	0.55897	0.71469	0.27320	1.12821	0.00000	0.15986	0.00000	0.00505	0.00000	0.00000	0.14667	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	0.74077							
0.400	0.55791	0.72543	0.25278	1.12843	0.00000	0.15787	0.00000	0.00463	0.00000	0.00000	0.14852	0.00000	0.05559
	0.00000	0.27718	0.00000	0.00000	0.00000	0.74860							
0.300	0.55884	0.73841	0.22588	1.12868	0.00000	0.15479	0.00000	0.00412	0.00000	0.00000	0.14997	0.00000	0.05560
	0.00000	0.27719	0.00000	0.00000	0.00000	0.76108							
0.200	0.56422	0.75487	0.18759	1.12900	0.00000	0.14931	0.00000	0.00348	0.00000	0.00000	0.15049	0.00000	0.05561
	0.00000	0.27720	0.00000	0.00000	0.00000	0.78236							
0.100	0.58229	0.77703	0.12521	1.12945	0.00000	0.13629	0.00000	0.00258	0.00000	0.00000	0.14863	0.00000	0.05562
	0.00000	0.27723	0.00000	0.00000	0.00000	0.82446							
0.080	0.58987	0.78221	0.10727	1.12958	0.00000	0.13116	0.00000	0.00233	0.00000	0.00000	0.14759	0.00000	0.05563

	0.00000	0.27724	0.00000	0.00000	0.00000	0.83828							
0.060	0.60085	0.78744	0.08584	1.12972	0.00000	0.12361	0.00000	0.00204	0.00000	0.00000	0.14609	0.00000	0.05564
	0.00000	0.27726	0.00000	0.00000	0.00000	0.85598							
0.050	0.60841	0.78985	0.07347	1.12981	0.00000	0.11832	0.00000	0.00188	0.00000	0.00000	0.14508	0.00000	0.05563
	0.00000	0.27725	0.00000	0.00000	0.00000	0.86696							
0.040	0.61820	0.79180	0.05979	1.12990	0.00000	0.11140	0.00000	0.00169	0.00000	0.00000	0.14378	0.00000	0.05565
	0.00000	0.27727	0.00000	0.00000	0.00000	0.88000							
0.030	0.63174	0.79266	0.04453	1.13001	0.00000	0.10174	0.00000	0.00146	0.00000	0.00000	0.14199	0.00000	0.05566
	0.00000	0.27731	0.00000	0.00000	0.00000	0.89617							
0.020	0.65253	0.79074	0.02760	1.13015	0.00000	0.08699	0.00000	0.00119	0.00000	0.00000	0.13918	0.00000	0.05568
	0.00000	0.27731	0.00000	0.00000	0.00000	0.91784							
0.010	0.69250	0.77961	0.00991	1.13035	0.00000	0.06034	0.00000	0.00080	0.00000	0.00000	0.13280	0.00000	0.05570
	0.00000	0.27734	0.00000	0.00000	0.00000	0.95305							
0.008	0.70667	0.77416	0.00664	1.13040	0.00000	0.05182	0.00000	0.00070	0.00000	0.00000	0.13004	0.00000	0.05571
	0.00000	0.27736	0.00000	0.00000	0.00000	0.96452							
0.006	0.72512	0.76635	0.00382	1.13046	0.00000	0.04184	0.00000	0.00058	0.00000	0.00000	0.12588	0.00000	0.05573
	0.00000	0.27740	0.00000	0.00000	0.00000	0.97932							
0.005	0.73701	0.76101	0.00263	1.13050	0.00000	0.03607	0.00000	0.00051	0.00000	0.00000	0.12287	0.00000	0.05573
	0.00000	0.27740	0.00000	0.00000	0.00000	0.98886							
0.004	0.75210	0.75398	0.00159	1.13054	0.00000	0.02947	0.00000	0.00044	0.00000	0.00000	0.11867	0.00000	0.05575
	0.00000	0.27744	0.00000	0.00000	0.00000	1.00114							
0.003	0.77208	0.74440	0.00079	1.13058	0.00000	0.02205	0.00000	0.00035	0.00000	0.00000	0.11246	0.00000	0.05576
	0.00000	0.27744	0.00000	0.00000	0.00000	1.01774							
0.002	0.80096	0.73024	0.00026	1.13063	0.00000	0.01379	0.00000	0.00025	0.00000	0.00000	0.10222	0.00000	0.05579
	0.00000	0.27744	0.00000	0.00000	0.00000	1.04268							
400.000	1.01856	0.61476	0.00850	1.12852	0.00000	0.00035	0.00015	0.00042	0.00058	0.00000	0.00000	0.00401	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.25207							
500.000	1.01839	0.61160	0.00752	1.12541	0.00000	0.00026	0.00051	0.00042	0.00110	0.00000	0.00000	0.01023	0.05551
	0.00000	0.27709	0.00000	0.00000	0.00000	1.25621							
600.000	1.01762	0.60533	0.00936	1.12053	0.00000	0.00029	0.00107	0.00064	0.00191	0.00001	0.00000	0.01977	0.05550
	0.00000	0.27709	0.00000	0.00000	0.00000	1.26064							

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT



DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

RDX 90/EXON 9.9 RHO = 1.7860 G/CC EO = 3.840295E+03 CAL/MOLE

.52059460 E+00 -2.44434834 E+00LN V 3.24515045 E-01LN V*2 -3.11391391 E-02LN V*3 7.67322723 E-04LN V*4

.70095253 E+00 -4.69676614 E-01LN V 1.30861580 E-01LN V*2 -2.04076767 E-02LN V*3 1.04551925 E-03LN V*4

.63357067 E+00 4.70415413 E-01LNP 7.21154809 E-02LN P*2 5.48379496 E-03LN P*3 1.55220958 E-04LN P*4

; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

TANT ADDED TO ENERGIES WAS 0.100000E+00

RE / AR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
000 (637.706)	0.3383	4502.1 (4407.4)	-1430.3	0.15984 (0.15633)	3.2613	613.0
000 (516.703)	0.3611	4172.7 (4179.1)	-1110.2	0.14645 (0.14562)	3.2056	1095.1
000 (406.442)	0.3895	3866.0 (3936.9)	-796.2	0.13331 (0.13423)	3.1420	1630.4
262 (322.435)	0.4196	3611.4 (3720.4)	-537.2	0.12248 (0.12449)	3.0806	2120.2
000 (300.231)	0.4294	3574.3 (3656.9)	-482.5	0.12019 (0.12189)	3.0616	2268.1
000 (194.756)	0.4960	3325.5 (3300.9)	-178.4	0.10747 (0.10799)	2.9465	3102.7
000 (95.555)	0.6367	2880.2 (2811.8)	213.8	0.09105 (0.09099)	2.7567	4271.3
000 (76.369)	0.6913	2743.5 (2679.2)	311.3	0.08698 (0.08684)	2.6969	4594.5
000 (57.394)	0.7697	2572.7 (2523.2)	422.3	0.08233 (0.08220)	2.6207	4979.5
000 (47.980)	0.8246	2470.4 (2432.1)	484.3	0.07974 (0.07962)	2.5730	5206.8
000 (38.584)	0.8984	2352.3 (2328.1)	552.3	0.07689 (0.07678)	2.5150	5469.8
000 (29.054)	1.0074	2214.3 (2202.8)	628.3	0.07371 (0.07358)	2.4396	5791.5
000 (19.713)	1.1851	2039.0 (2048.5)	718.5	0.06994 (0.06980)	2.3368	6197.4
000 (10.159)	1.5915	1798.6 (1824.3)	837.0	0.06498 (0.06481)	2.2162	6813.6
000 (8.200)	1.7594	1734.0 (1761.3)	868.6	0.06366 (0.06351)	2.1069	6994.8
000 (6.202)	2.0135	1659.7 (1685.1)	904.9	0.06214 (0.06200)	2.0348	7219.6
000 (5.187)	2.2005	1616.6 (1639.8)	925.9	0.06126 (0.06112)	1.9891	7357.2
000 (4.161)	2.4622	1567.6 (1587.2)	950.2	0.06024 (0.06013)	1.9331	7520.9
000 (3.117)	2.8677	1511.2 (1523.6)	977.8	0.05909 (0.05896)	1.8607	7726.2
000 (2.068)	3.5972	1438.1 (1442.5)	1014.8	0.05754 (0.05747)	1.7601	8001.4
000 (1.019)	5.4891	1330.4 (1324.3)	1070.5	0.05521 (0.05524)	1.5949	8440.0
800 (0.810)	6.3511	1299.4 (1291.0)	1086.8	0.05453 (0.05458)	1.5444	8573.8
600 (0.603)	7.7185	1261.0 (1251.0)	1107.2	0.05367 (0.05376)	1.4819	8741.6
500 (0.500)	8.7712	1237.4 (1227.1)	1119.8	0.05315 (0.05325)	1.4441	8845.5
400 (0.398)	10.3050	1209.2 (1199.1)	1134.9	0.05252 (0.05264)	1.3997	8970.7
300 (0.296)	12.7786	1173.7 (1164.8)	1153.9	0.05172 (0.05186)	1.3464	9128.8
200 (0.196)	17.5323	1124.9 (1118.9)	1180.1	0.05063 (0.05079)	1.2797	9346.1
100 (0.097)	30.9263	1043.3 (1043.7)	1223.0	0.04883 (0.04898)	1.1932	9702.6
080 (0.078)	37.3154	1017.7 (1019.5)	1236.1	0.04828 (0.04841)	1.1735	9813.6
060 (0.059)	47.6127	984.8 (988.1)	1252.6	0.04759 (0.04769)	1.1543	9953.8
050 (0.049)	55.5976	964.0 (967.9)	1262.8	0.04716 (0.04723)	1.1456	10041.1
040 (0.039)	67.2473	938.7 (942.8)	1275.0	0.04665 (0.04668)	1.1387	10146.5
030 (0.030)	85.9479	906.1 (909.9)	1290.1	0.04602 (0.04599)	1.1356	10280.1
020 (0.020)	121.3711	860.2 (862.5)	1310.4	0.04517 (0.04506)	1.1419	10464.4
010 (0.010)	217.7105	780.2 (780.0)	1342.6	0.04383 (0.04363)	1.1788	10768.6
008 (0.008)	262.2043	753.9 (753.5)	1352.3	0.04342 (0.04323)	1.1970	10863.5
006 (0.006)	333.2510	720.9 (719.6)	1363.8	0.04294 (0.04276)	1.2248	10984.4
005 (0.005)	387.8306	700.4 (698.3)	1370.6	0.04265 (0.04250)	1.2447	11060.0
004 (0.004)	466.1655	674.9 (673.0)	1378.9	0.04231 (0.04222)	1.2713	11150.7
003 (0.003)	590.1760	642.2 (641.3)	1389.0	0.04188 (0.04194)	1.3090	11265.1
002 (0.002)	820.8792	596.9 (599.0)	1402.3	0.04133 (0.04170)	1.3682	11421.0

POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

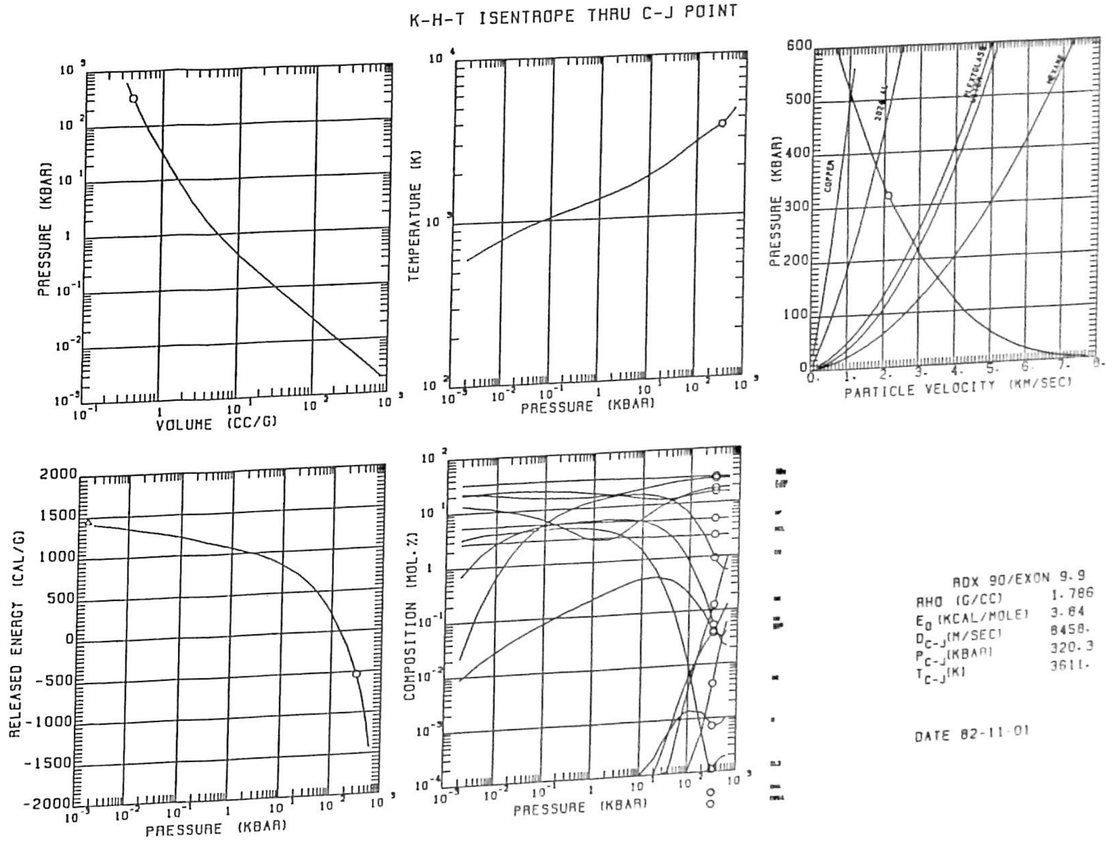
RDX 90/EXON 9.9 RHO = 1.7860 G/CC EO = 3.840295E+03 CAL/MOLE

THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

H2O / CCL4	CO2 / HF	CO / F2	N2 / CL2	CF4 / CLF	H2 / C(S)	O2	NH3	OH	H	CH4	NO	HCL
1.11084	0.63919	0.03759	1.21350	0.00000	0.00218	0.00018	0.00167	0.00153	0.00003	0.00000	0.00516	0.10061
0.00000	0.20114	0.00000	0.00000	0.00000	0.74123							
1.11009	0.63708	0.04354	1.21381	0.00000	0.00267	0.00014	0.00188	0.00144	0.00003	0.00000	0.00433	0.10061
0.00000	0.20114	0.00000	0.00000	0.00000	0.73739							
1.10231	0.61633	0.09663	1.21444	0.00000	0.00806	0.00002	0.00363	0.00087	0.00005	0.00002	0.00133	0.10061
0.00000	0.20114	0.00000	0.00000	0.00000	0.70504							
1.07001	0.55943	0.24460	1.21264	0.00000	0.03271	0.00000	0.00843	0.00024	0.00006	0.00040	0.00014	0.10061
0.00000	0.20115	0.00000	0.00000	0.00000	0.61359							
1.05290	0.54010	0.30054	1.21173	0.00000	0.04611	0.00000	0.01031	0.00014	0.00005	0.00086	0.00006	0.10062
0.00000	0.20115	0.00000	0.00000	0.00000	0.57651							
1.02590	0.51854	0.37077	1.21055	0.00000	0.06701	0.00000	0.01273	0.00007	0.00004	0.00212	0.00002	0.10062
0.00000	0.20115	0.00000	0.00000	0.00000	0.52658							
1.00608	0.50767	0.41238	1.20984	0.00000	0.08190	0.00000	0.01415	0.00004	0.00003	0.00352	0.00001	0.10062
0.00000	0.20115	0.00000	0.00000	0.00000	0.49445							
0.97911	0.49777	0.45924	1.20907	0.00000	0.10126	0.00000	0.01570	0.00002	0.00002	0.00618	0.00000	0.10062
0.00000	0.20116	0.00000	0.00000	0.00000	0.45483							
0.94198	0.49126	0.50937	1.20839	0.00000	0.12610	0.00000	0.01706	0.00001	0.00002	0.01131	0.00000	0.10063
0.00000	0.20116	0.00000	0.00000	0.00000	0.40608							
0.88183	0.49269	0.56670	1.20783	0.00000	0.15929	0.00000	0.01817	0.00000	0.00001	0.02395	0.00000	0.10063
0.00000	0.20117	0.00000	0.00000	0.00000	0.33467							
0.77677	0.52028	0.61654	1.20837	0.00000	0.19840	0.00000	0.01710	0.00000	0.00000	0.05773	0.00000	0.10065
0.00000	0.20118	0.00000	0.00000	0.00000	0.22347							
0.74606	0.53410	0.61961	1.20882	0.00000	0.20547	0.00000	0.01621	0.00000	0.00000	0.07021	0.00000	0.10065
0.00000	0.20119	0.00000	0.00000	0.00000	0.19410							
0.70929	0.55314	0.61830	1.20946	0.00000	0.21208	0.00000	0.01492	0.00000	0.00000	0.08626	0.00000	0.10065
0.00000	0.20119	0.00000	0.00000	0.00000	0.16033							
0.68839	0.56586	0.61376	1.20989	0.00000	0.21486	0.00000	0.01406	0.00000	0.00000	0.09596	0.00000	0.10066
0.00000	0.20119	0.00000	0.00000	0.00000	0.14244							
0.66564	0.58197	0.60430	1.21042	0.00000	0.21701	0.00000	0.01300	0.00000	0.00000	0.10706	0.00000	0.10066
0.00000	0.20119	0.00000	0.00000	0.00000	0.12471							
0.63954	0.60173	0.59089	1.21107	0.00000	0.21928	0.00000	0.01170	0.00000	0.00000	0.11994	0.00000	0.10066
0.00000	0.20120	0.00000	0.00000	0.00000	0.10547							
0.61217	0.63119	0.55934	1.21192	0.00000	0.21940	0.00000	0.01001	0.00000	0.00000	0.13483	0.00000	0.10067
0.00000	0.20121	0.00000	0.00000	0.00000	0.09267							
0.58323	0.67999	0.49069	1.21311	0.00000	0.21651	0.00000	0.00764	0.00000	0.00000	0.15252	0.00000	0.10068
0.00000	0.20122	0.00000	0.00000	0.00000	0.09486							
0.57776	0.69485	0.46644	1.21343	0.00000	0.21520	0.00000	0.00700	0.00000	0.00000	0.15639	0.00000	0.10069
0.00000	0.20122	0.00000	0.00000	0.00000	0.10034							
0.57353	0.71374	0.43291	1.21380	0.00000	0.21296	0.00000	0.00625	0.00000	0.00000	0.16018	0.00000	0.10069
0.00000	0.20123	0.00000	0.00000	0.00000	0.11121							
0.57228	0.72542	0.41079	1.21402	0.00000	0.21131	0.00000	0.00582	0.00000	0.00000	0.16195	0.00000	0.10070
0.00000	0.20124	0.00000	0.00000	0.00000	0.11989							

	0.00000	0.20128	0.00000	0.00000	0.00000	0.25511							
0.060	0.62216	0.83086	0.15007	1.21574	0.00000	0.17308	0.00000	0.00238	0.00000	0.00000	0.15869	0.00000	0.10074
	0.00000	0.20129	0.00000	0.00000	0.00000	0.27843							
0.050	0.63031	0.83611	0.13141	1.21584	0.00000	0.16737	0.00000	0.00219	0.00000	0.00000	0.15761	0.00000	0.10075
	0.00000	0.20129	0.00000	0.00000	0.00000	0.29291							
0.040	0.64082	0.84141	0.11031	1.21594	0.00000	0.15981	0.00000	0.00198	0.00000	0.00000	0.15629	0.00000	0.10075
	0.00000	0.20130	0.00000	0.00000	0.00000	0.31001							
0.030	0.65530	0.84639	0.08588	1.21607	0.00000	0.14899	0.00000	0.00173	0.00000	0.00000	0.15464	0.00000	0.10077
	0.00000	0.20131	0.00000	0.00000	0.00000	0.33115							
0.020	0.67757	0.84964	0.05712	1.21622	0.00000	0.13175	0.00000	0.00142	0.00000	0.00000	0.15235	0.00000	0.10078
	0.00000	0.20133	0.00000	0.00000	0.00000	0.35894							
0.010	0.72159	0.84454	0.02331	1.21644	0.00000	0.09740	0.00000	0.00099	0.00000	0.00000	0.14783	0.00000	0.10080
	0.00000	0.20136	0.00000	0.00000	0.00000	0.40238							
0.008	0.73741	0.84012	0.01634	1.21650	0.00000	0.08560	0.00000	0.00087	0.00000	0.00000	0.14590	0.00000	0.10081
	0.00000	0.20137	0.00000	0.00000	0.00000	0.41571							
0.006	0.75803	0.83299	0.00998	1.21657	0.00000	0.07128	0.00000	0.00073	0.00000	0.00000	0.14285	0.00000	0.10082
	0.00000	0.20138	0.00000	0.00000	0.00000	0.43223							
0.005	0.77130	0.82778	0.00714	1.21661	0.00000	0.06278	0.00000	0.00065	0.00000	0.00000	0.14052	0.00000	0.10083
	0.00000	0.20138	0.00000	0.00000	0.00000	0.44262							
0.004	0.78846	0.82052	0.00452	1.21666	0.00000	0.05250	0.00000	0.00056	0.00000	0.00000	0.13715	0.00000	0.10084
	0.00000	0.20140	0.00000	0.00000	0.00000	0.45587							
0.003	0.81125	0.81021	0.00236	1.21671	0.00000	0.04045	0.00000	0.00046	0.00000	0.00000	0.13184	0.00000	0.10086
	0.00000	0.20142	0.00000	0.00000	0.00000	0.47364							
0.002	0.84441	0.79440	0.00084	1.21677	0.00000	0.02630	0.00000	0.00033	0.00000	0.00000	0.12242	0.00000	0.10088
	0.00000	0.20145	0.00000	0.00000	0.00000	0.50041							
400.000	1.11165	0.63978	0.02786	1.21056	0.00000	0.00138	0.00053	0.00138	0.00238	0.00003	0.00000	0.01134	0.10060
	0.00000	0.20114	0.00000	0.00001	0.00000	0.75038							
500.000	1.11156	0.63500	0.02230	1.20450	0.00000	0.00095	0.00139	0.00130	0.00366	0.00003	0.00000	0.02353	0.10060
	0.00000	0.20114	0.00000	0.00001	0.00000	0.76072							
600.000	1.11037	0.62631	0.02278	1.19700	0.00000	0.00088	0.00239	0.00166	0.00512	0.00004	0.00000	0.03818	0.10060
	0.00000	0.20114	0.00000	0.00001	0.00000	0.76893							

PRESS ;KBAR, PRODUCTS ;MOLES



T I E S <<DATE 82-11-01>> **********

R E S S U R E <<DATE 82-11-01>> **********

ED = 3.729676E+03 CAL/MOLE

V**2 -3.16957310 E-02LN V**3 7.82580348 E-04LN V**4

V**2 -1.97190493 E-02LN V**3 1.00227026 E-03LN V**4

P**2 5.41205704 E-03LN P**3 1.53035115 E-04LN P**4

NERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
0.15687 (0.15332)	3.2836	643.6
0.14372 (0.14290)	3.2276	1122.7
0.13083 (0.13181)	3.1639	1653.8
0.12149 (0.12353)	3.1105	2075.4
0.11815 (0.11978)	3.0826	2292.0
0.10568 (0.10622)	2.9670	3120.4
0.08969 (0.08961)	2.7761	4281.4
0.08568 (0.08555)	2.7161	4601.8
0.08114 (0.08101)	2.6394	4984.0
0.07861 (0.07848)	2.5914	5209.7
0.07582 (0.07570)	2.5330	5470.8
0.07271 (0.07257)	2.4569	5791.1
0.06900 (0.06886)	2.3534	6193.7
0.06415 (0.06398)	2.1779	6804.8
0.06284 (0.06271)	2.1219	6983.8
0.06135 (0.06123)	2.0493	7206.2
0.06049 (0.06037)	2.0032	7342.5
0.05956 (0.05940)	1.9465	7505.5
0.05838 (0.05826)	1.8739	7707.3
0.05684 (0.05681)	1.7731	7978.0
0.05461 (0.05464)	1.6063	8411.7
0.05395 (0.05400)	1.5554	8543.5
0.05312 (0.05320)	1.4924	8708.7
0.05261 (0.05271)	1.4543	8811.0
0.05200 (0.05212)	1.4096	8934.0
0.05123 (0.05137)	1.3559	9089.4
0.05018 (0.05033)	1.2885	9302.9
0.04844 (0.04860)	1.2011	9652.9
0.04792 (0.04805)	1.1812	9761.8
0.04725 (0.04735)	1.1617	9899.2
0.04684 (0.04691)	1.1529	9984.7
0.04635 (0.04638)	1.1459	10087.9
0.04575 (0.04572)	1.1428	10218.6
0.04493 (0.04483)	1.1491	10398.5
0.04366 (0.04347)	1.1864	10695.3
0.04328 (0.04308)	1.2047	10787.6
0.04282 (0.04264)	1.2328	10905.2
0.04255 (0.04239)	1.2529	10978.7
0.04222 (0.04213)	1.2798	11066.9
0.04182 (0.04187)	1.3179	11178.1
0.04129 (0.04166)	1.3778	11329.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUA

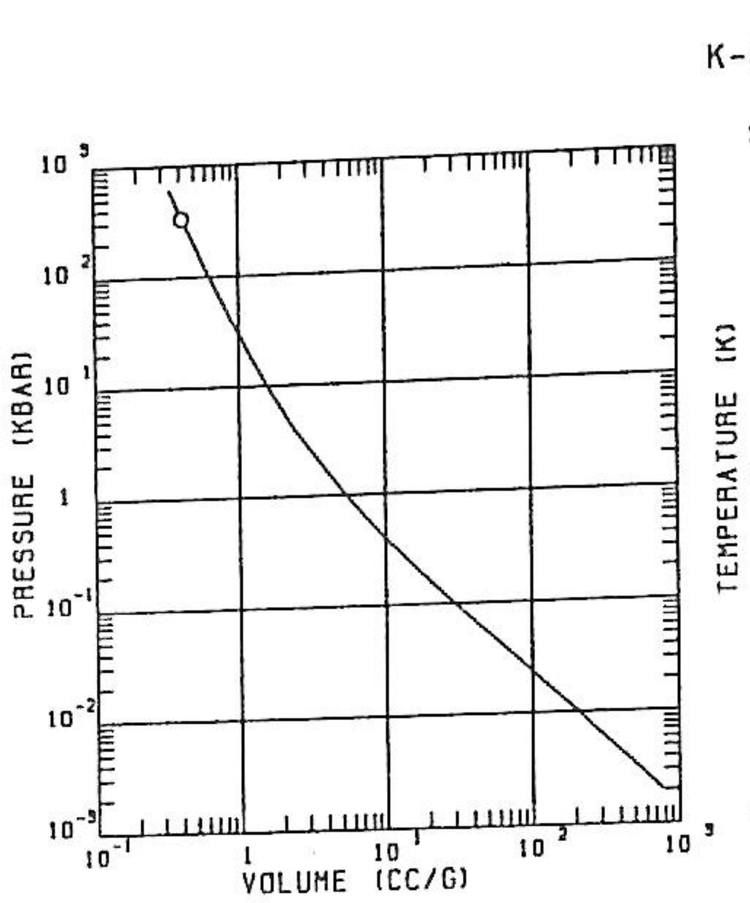
********** A K-H-T I S E N T R O P E

HMX 92/EXON 6.00/CEF 2 RHO

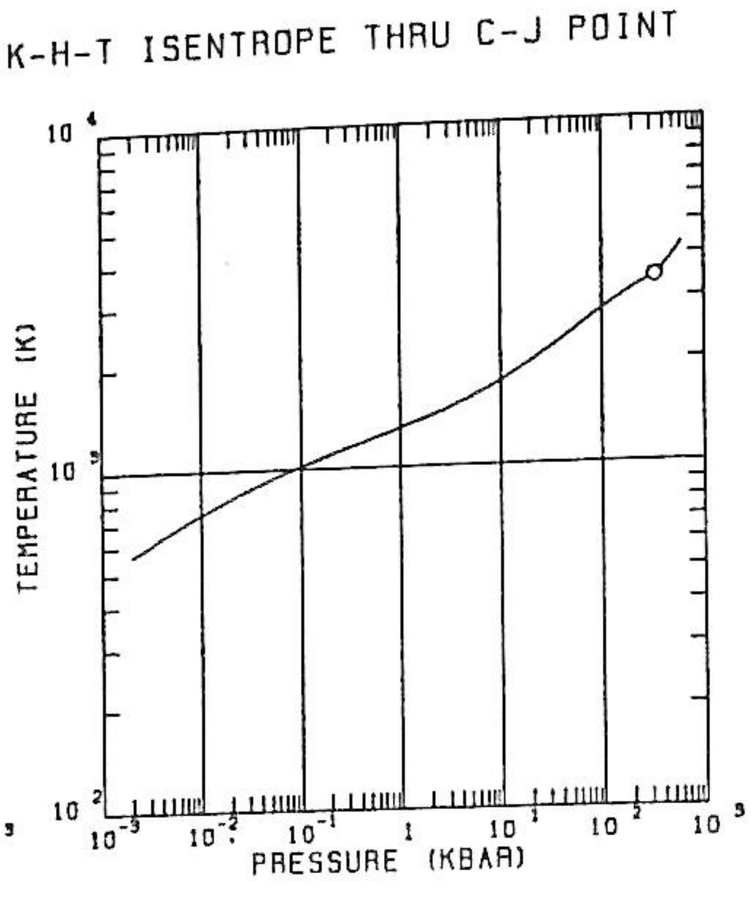
THE ISENTREOPE PRESSURE AND C

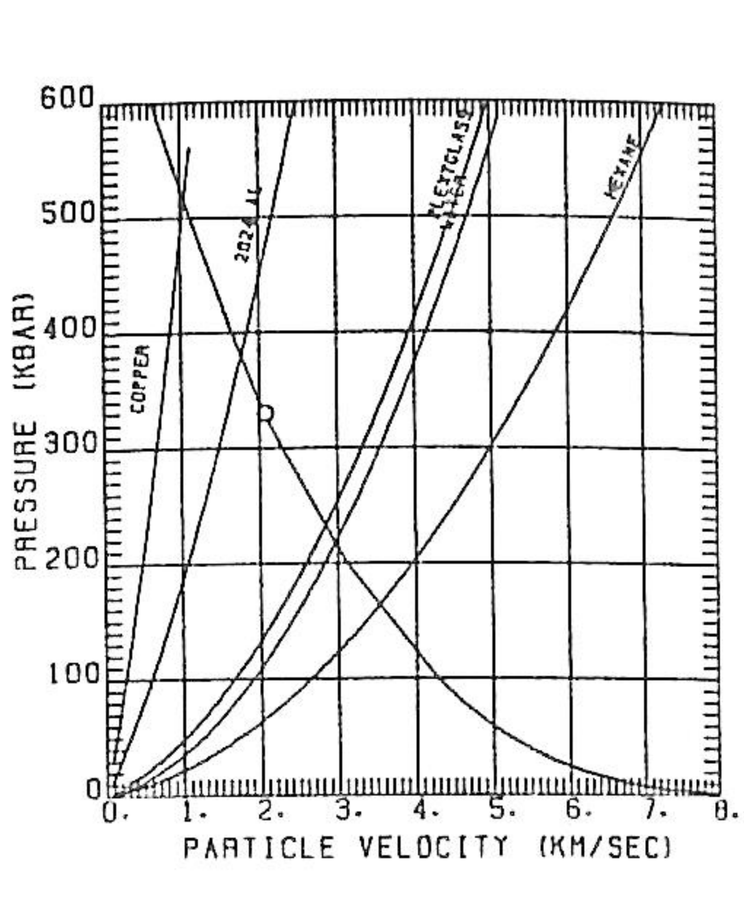
PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 PCL3
330.164	1.21955	0.62884	0.02389	1.23998	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00000
300.000	1.21864	0.62671	0.03010	1.24029	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00000
200.000	1.21179	0.61116	0.07061	1.24047	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00001
100.000	1.18173	0.56538	0.19361	1.23837	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00016
80.000	1.16547	0.54953	0.24181	1.23739	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00028
60.000	1.13929	0.53168	0.30401	1.23608	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00053
50.000	1.11980	0.52287	0.34137	1.23529	0.00000
	0.00000	0.12196	0.00000	0.00000	0.00075
40.000	1.09292	0.51525	0.38384	1.23441	0.00000
	0.00000	0.12196	0.00000	0.00000	0.00107
30.000	1.05529	0.51144	0.42955	1.23360	0.00000
	0.00000	0.12196	0.00000	0.00000	0.00154
20.000	0.99275	0.51681	0.48207	1.23288	0.00000
	0.00000	0.12197	0.00000	0.00000	0.00224
10.000	0.87874	0.55114	0.52841	1.23333	0.00000
	0.00000	0.12197	0.00000	0.00000	0.00322
8.000	0.84476	0.56734	0.53021	1.23380	0.00000
	0.00000	0.12198	0.00000	0.00000	0.00344
6.000	0.80329	0.58893	0.52875	1.23449	0.00000
	0.00000	0.12198	0.00000	0.00000	0.00368
5.000	0.77925	0.60289	0.52500	1.23495	0.00000
	0.00000	0.12199	0.00000	0.00000	0.00381
4.000	0.75169	0.61922	0.52004	1.23551	0.00000
	0.00000	0.12199	0.00000	0.00000	0.00394
3.000	0.72254	0.64147	0.50481	1.23622	0.00000
	0.00000	0.12199	0.00000	0.00000	0.00406
2.000	0.69140	0.67300	0.47297	1.23714	0.00000
	0.00000	0.12200	0.00000	0.00000	0.00414
1.000	0.65596	0.72109	0.41227	1.23843	0.00000
	0.00000	0.12201	0.00000	0.00000	0.00417
0.800	0.64922	0.73556	0.39006	1.23878	0.00000
	0.00000	0.12201	0.00000	0.00000	0.00415
0.600	0.64361	0.75362	0.35950	1.23919	0.00000
	0.00000	0.12202	0.00000	0.00000	0.00410
0.500	0.64175	0.76457	0.33941	1.23943	0.00000
	0.00000	0.12203	0.00000	0.00000	0.00405
0.400	0.64110	0.77736	0.31441	1.23970	0.00000
	0.00000	0.12203	0.00000	0.00000	0.00398
0.300	0.64283	0.79286	0.28157	1.24001	0.00000
	0.00000	0.12203	0.00000	0.00000	0.00386
0.200	0.64978	0.81261	0.23491	1.24041	0.00000
	0.00000	0.12204	0.00000	0.00000	0.00365
0.100	0.67180	0.83953	0.15856	1.24098	0.00000
	0.00000	0.12206	0.00000	0.00000	0.00314
0.080	0.68086	0.84592	0.13655	1.24113	0.00000
	0.00000	0.12207	0.00000	0.00000	0.00295
0.060	0.69396	0.85250	0.11001	1.24131	0.00000
	0.00000	0.12208	0.00000	0.00000	0.00268
0.050	0.70295	0.85563	0.09457	1.24141	0.00000
	0.00000	0.12208	0.00000	0.00000	0.00249
0.040	0.71463	0.85826	0.07741	1.24153	0.00000
	0.00000	0.12209	0.00000	0.00000	0.00225
0.030	0.73076	0.85968	0.05810	1.24167	0.00000
	0.00000	0.12210	0.00000	0.00000	0.00193
0.020	0.75560	0.85790	0.03637	1.24184	0.00000
	0.00000	0.12211	0.00000	0.00000	0.00146
0.010	0.80381	0.84504	0.01319	1.24209	0.00000
	0.00000	0.12213	0.00000	0.00000	0.00075
0.008	0.82126	0.83843	0.00879	1.24215	0.00000
	0.00000	0.12215	0.00000	0.00000	0.00056
0.006	0.84388	0.82891	0.00503	1.24223	0.00000
	0.00000	0.12216	0.00000	0.00000	0.00037
0.005	0.85851	0.82234	0.00344	1.24227	0.00000
	0.00000	0.12216	0.00000	0.00000	0.00028
0.004	0.87728	0.81361	0.00206	1.24232	0.00000
	0.00000	0.12217	0.00000	0.00000	0.00019
0.003	0.90220	0.80164	0.00100	1.24238	0.00000
	0.00000	0.12218	0.00000	0.00000	0.00011
0.002	0.93870	0.78371	0.00032	1.24245	0.00000
	0.00000	0.12221	0.00000	0.00000	0.00004
400.000	1.22013	0.62889	0.01826	1.23808	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00000
500.000	1.22010	0.62511	0.01462	1.23353	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00000
600.000	1.21913	0.61835	0.01532	1.22767	0.00000
	0.00000	0.12195	0.00000	0.00000	0.00000

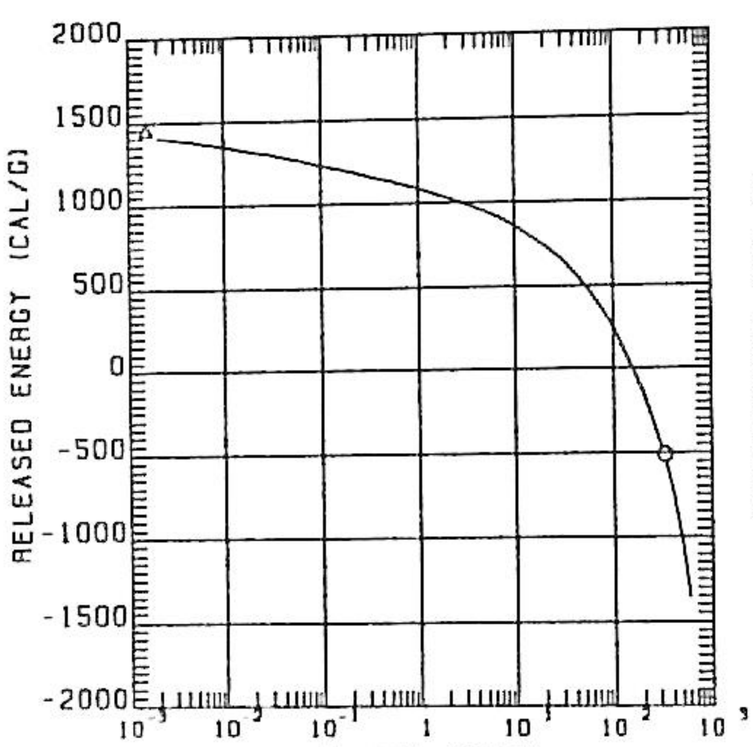
PRESS ;KBAR, PRODUCTS ;MOLES

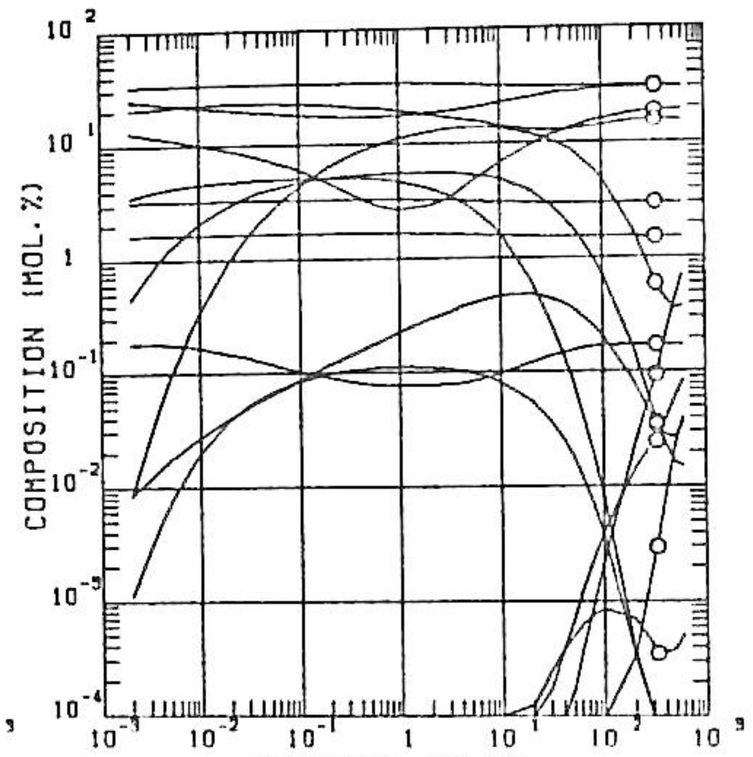


K-H-T ISENTROPE THRU C-J POINT









HMX 92/EXON 6.00/CEF 2

RHO (G/CC)	1.837
E_0 (KCAL/MOLE)	3.73
D_{C-J}(M/SEC)	8660.
P_{C-J}(KBAR)	330.2
T_{C-J}(K)	3442.

DATE 82-11 01

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-27>> **********

EXPLOSIVES	PICRYLSULFID E	#PICRYLSULFID E	# HNDS	# HNDS	# HNDS	# TNBSA	# TNBSA	#
RHO (G/CC)	1.650	1.500	1.841	1.600	1.400	1.500	1.400	
EO (KCAL/MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MOL.WEIGHT (G)	456.262	456.262	488.261	488.261	488.261	245.171	245.171	
C	12.0000	12.0000	12.0000	12.0000	12.0000	6.0000	6.0000	
H	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	
N	6.0000	6.0000	6.0000	6.0000	6.0000	3.0000	3.0000	
O	12.0000	12.0000	14.0000	14.0000	14.0000	6.0000	6.0000	
S	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
DETN.VEL (M/SEC)	6624.4	6246.5	7352.9	6722.5	6248.5	6064.4	5850.7	
PARTICL.VEL(")	1691.9	1670.6	1856.1	1770.5	1706.5	1608.2	1614.8	
C-J PRESS (KBAR)	184.9	156.5	251.3	190.4	149.3	146.3	132.3	
C-J VOLUME (CC/G)	0.45127	0.48837	0.40607	0.46039	0.51921	0.48988	0.51715	
C-J TEMP (DEG K)	3670.4	3734.8	3878.6	3997.7	4037.9	3492.4	3538.9	
C-J S(CAL/DEG MOL)	66.66	65.70	66.29	65.43	63.30	65.91	64.88	
C-J ENERGY (CAL/G)	342.10	333.53	411.69	374.62	347.99	309.05	311.61	
GAMMA	2.915	2.739	2.961	2.797	2.662	2.771	2.623	
C-J DETN.HEAT(CAL)	1189.7	1164.0	1314.6	1276.0	1225.4	1082.5	1068.4	
LAMDA	11.3086	11.1735	11.6085	11.3850	11.1263	11.1456	11.0947	
VOLUM(K LITTRE/KG)	0.5629	0.5830	0.5671	0.5921	0.6298	0.5732	0.5919	
TOTAL PRODCT(MOLE)	17.9494	17.8302	18.0052	17.9482	17.7523	9.6466	9.5123	
V GAS (MOLES)	10.4984	10.8731	11.3177	11.8162	12.5697	5.7439	5.9318	
V GAS (CC/MOLE)	16.9644	17.9897	15.5292	17.0950	18.5273	18.2164	18.9221	
V SOL C(S) (CC/G)	0.31063	0.32578	0.28030	0.30950	0.33145	0.33009	0.33831	
H2O (MOL %)	10.8421	10.6098	10.9719	10.7466	10.3371	14.2943	13.9972	
CO2 (MOL %)	20.3516	19.7106	26.2097	24.3886	22.6278	14.4782	15.1620	
CO (MOL %)	4.8914	8.2211	3.2870	8.1880	15.2442	5.8403	8.2995	
N2 (MOL %)	16.6681	16.7727	16.5917	16.6400	16.8219	15.4900	15.7019	
H2S (MOL %)	0.0781	0.2328	0.0100	0.0903	0.3459	0.7410	1.0904	
CS2 (MOL %)	0.0995	0.3493	0.0086	0.1164	0.5273	1.4195	1.9688	
S (MOL %)	0.0021	0.0056	0.0006	0.0045	0.0144	0.0070	0.0105	
H2 (MOL %)	0.1400	0.2603	0.0629	0.1959	0.4256	0.3471	0.4847	
O2 (MOL %)	0.0014	0.0012	0.0052	0.0039	0.0027	0.0004	0.0004	
NH3 (MOL %)	0.0439	0.0607	0.0274	0.0502	0.0732	0.0989	0.1138	
OH (MOL %)	0.0286	0.0354	0.0421	0.0613	0.0721	0.0215	0.0255	
H (MOL %)	0.0019	0.0039	0.0013	0.0047	0.0107	0.0027	0.0042	
CH4 (MOL %)	0.0006	0.0017	0.0001	0.0009	0.0032	0.0033	0.0056	
NO (MOL %)	0.0472	0.0445	0.1131	0.0992	0.0814	0.0200	0.0207	
SO2 (MOL %)	5.0472	4.2954	5.3853	4.8778	3.6490	6.2855	4.9345	
SO (MOL %)	0.2451	0.3762	0.1409	0.3662	0.5693	0.4937	0.5398	
C(S) (MOL %)	41.5114	39.0189	37.1421	34.1653	29.1944	40.4566	37.6406	

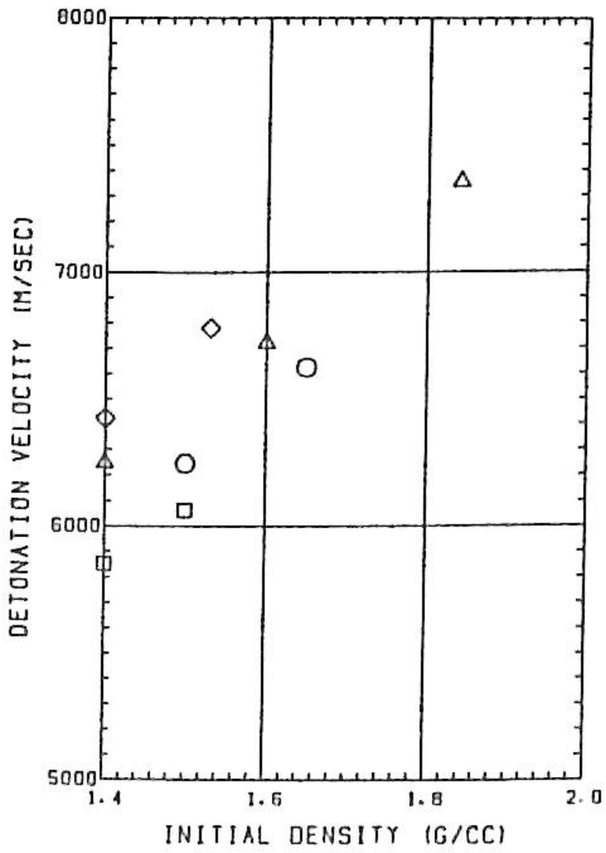
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENE

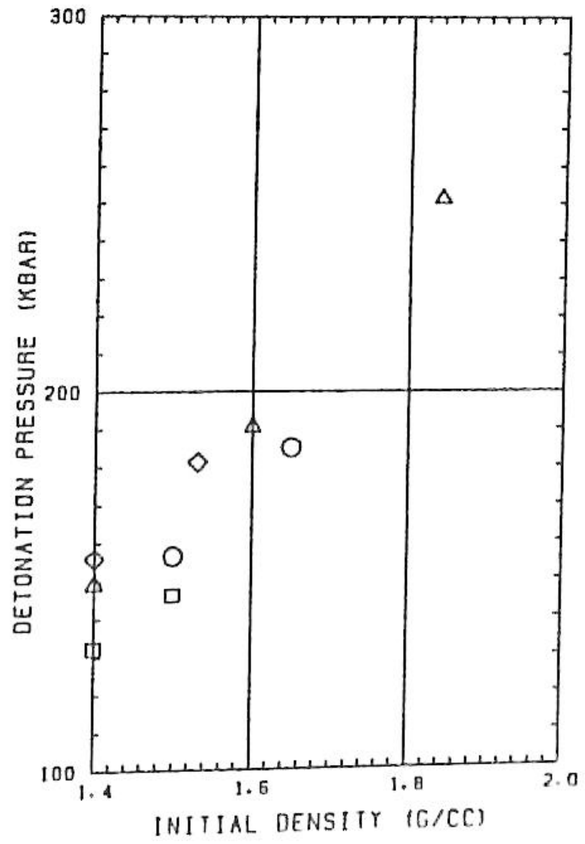
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-27>> **********

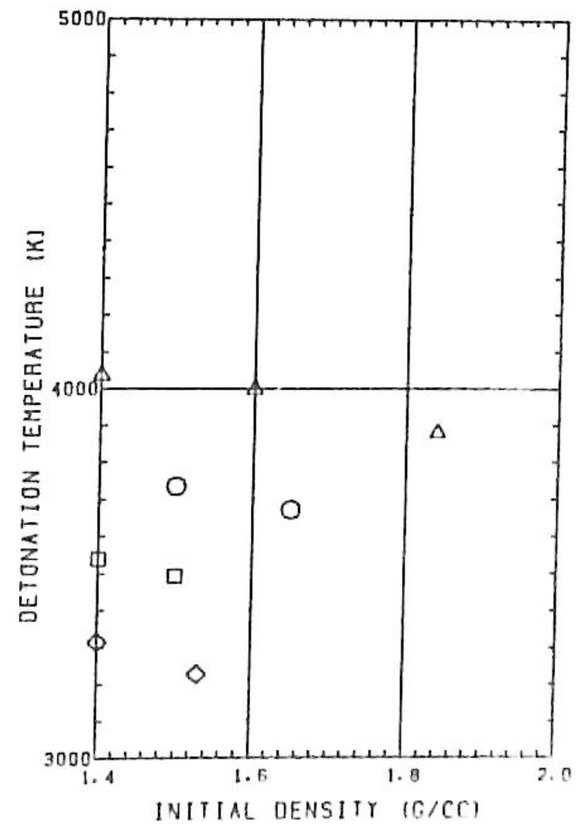
EXPLOSIVES		DNPS	# DNPS #
RHO	(G/CC)	1.530	1.400
EO	(KCAL/MOLE)	-136.00	-136.00
MOL.WEIGHT	(G)	346.231	346.231
C		6.0000	6.0000
H		10.0000	10.0000
N		4.0000	4.0000
O		11.0000	11.0000
S		1.0000	1.0000
DETN.VEL	(M/SEC)	6780.6	6426.1
PARTICL.VEL(")		1746.0	1734.5
C-J PRESS	(KBAR)	181.1	156.0
C-J VOLUME	(CC/G)	0.48529	0.52149
C-J TEMP	(DEG K)	3227.3	3314.7
C-J S(CAL/DEG MOL)		58.74	58.68
C-J ENERGY	(CAL/G)	364.32	359.52
GAMMA		2.883	2.705
C-J DETN.HEAT(CAL)		1168.2	1154.6
LAMDA		9.5746	9.5785
VOLUM(K LITTRE/KG)		0.7227	0.7386
TOTAL PRODCT(MOLE)		13.9234	13.7799
V GAS	(MOLES)	10.2271	10.4524
V GAS	(CC/MOLE)	15.0820	16.0360
V SOL C(S)	(CC/G)	0.31035	0.32381
H2O	(MOL %)	35.2170	34.8136
CO2	(MOL %)	14.0406	14.6320
CO	(MOL %)	2.3807	4.3434
N2	(MOL %)	14.2957	14.4143
H2S	(MOL %)	0.1952	0.5958
CS2	(MOL %)	0.1225	0.4137
S	(MOL %)	0.0010	0.0030
H2	(MOL %)	0.3012	0.5751
O2	(MOL %)	0.0003	0.0003
NH3	(MOL %)	0.1231	0.1842
OH	(MOL %)	0.0173	0.0237
H	(MOL %)	0.0012	0.0026
CH4	(MOL %)	0.0016	0.0053
NO	(MOL %)	0.0140	0.0148
SO2	(MOL %)	6.5517	5.5354
SO	(MOL %)	0.1894	0.2954
C(S)	(MOL %)	26.5473	24.1473

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES







○ PICRYLSULFIDE
△ HNDS
□ TNBSA
◇ DNPS

DATE 82-10-27

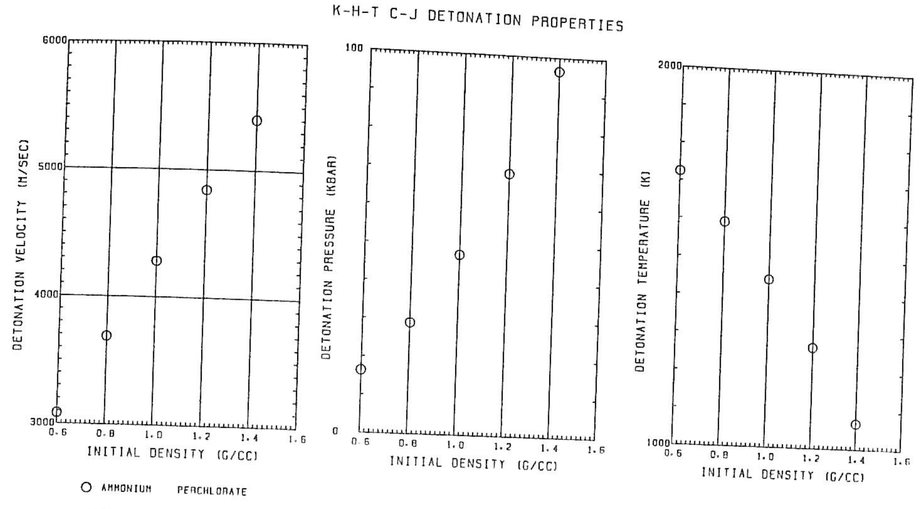
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES		TFTF #
RHO	(G/CC)	1.800
EO	(KCAL/MOLE)	-114.00
MOL.WEIGHT	(G)	267.078
C		6.0000
N		3.0000
O		6.0000
F		3.0000
DETN.VEL	(M/SEC)	7011.3
PARTICL.VEL	(")	1744.7
C-J PRESS	(KBAR)	220.2
C-J VOLUME	(CC/G)	0.41731
C-J TEMP	(DEG K)	3815.6
C-J S	(CAL/DEG MOL)	68.91
C-J ENERGY	(CAL/G)	363.76
GAMMA		3.019
C-J DETN.HEAT	(CAL)	1225.0
LAMDA		15.0312
VOLUM	(K LITTRE/KG)	0.4980
TOTAL PRODCT	(MOLE)	7.5044
V GAS	(MOLES)	5.4366
V GAS	(CC/MOLE)	19.1567
V SOL C(S)	(CC/G)	0.29425
CO2	(MOL %)	37.4438
CO	(MOL %)	4.9655
N2	(MOL %)	19.9417
CF4	(MOL %)	9.9903
O2	(MOL %)	0.0036
NO	(MOL %)	0.0934
F2	(MOL %)	0.0077
C(S)	(MOL %)	27.5540

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF ASES CORRESPONDING TO 1ATM,25 DEG C

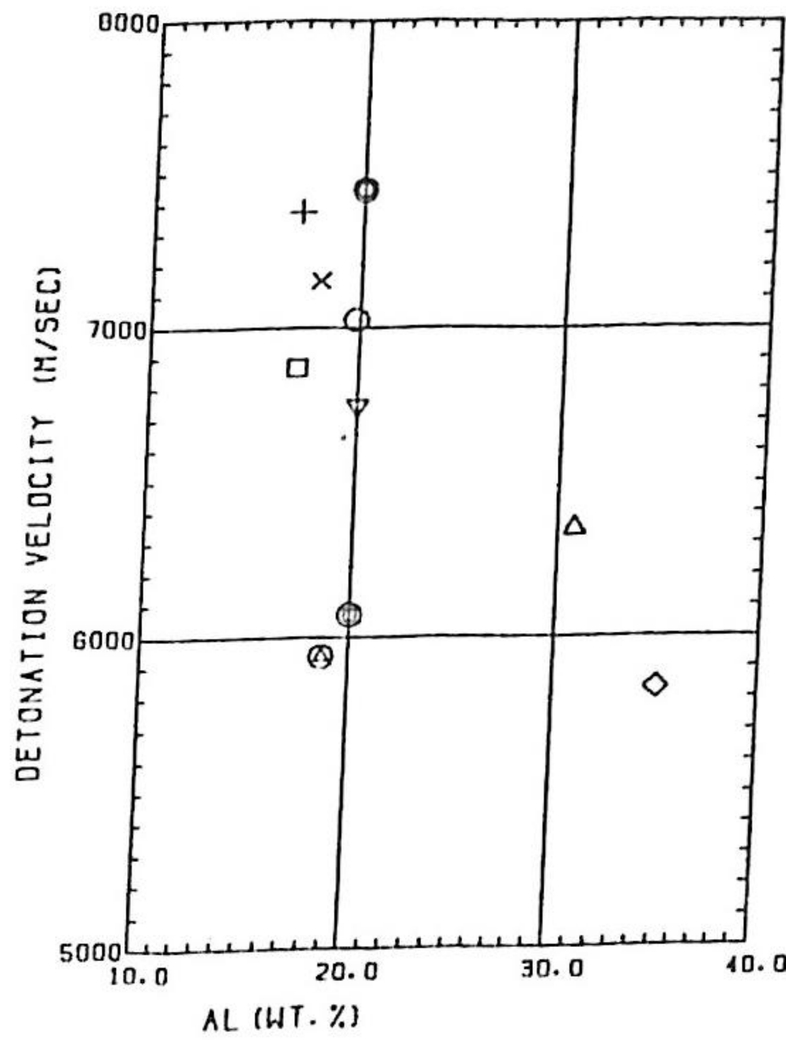
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E <<DATE 82-11-01>> **********

EXPLOSIVES		AMMONIUM PERCHLORATE	#AMMONIUM PERCHLORATE	#AMMONIUM PERCHLORATE	#AMMONIUM PERCHLORATE	#AMMONUM PERCHORATE #
RHO	(G/CC)	1.400	1.200	1.000	0.800	0.00
EO	(KCAL/MOLE)	-70.73	-70.73	-70.73	-70.73	-7(73
MOL.WEIGHT	(G)	117.489	117.489	117.489	117.489	117.89
N		1.0000	1.0000	1.0000	1.0000	1.(00
H		4.0000	4.0000	4.0000	4.0000	4.(00
CL		1.0000	1.0000	1.0000	1.0000	1.(00
O		4.0000	4.0000	4.0000	4.0000	4.(00
DETN.VEL	(M/SEC)	5395.7	4840.1	4277.2	3686.6	301.9
PARTICL.VEL	(")	1277.0	1186.0	1101.3	982.9	81.1
C-J PRESS	(KBAR)	96.5	68.9	47.1	29.0	.3
C-J VOLUME	(CC/G)	0.54524	0.62915	0.74252	0.91674	1.1(35
C-J TEMP	(DEG K)	1068.7	1268.1	1445.1	1592.7	17(.2
C-J S	(CAL/DEG MOL)	40.26	42.30	43.99	45.48	4.86
C-J ENERGY	(CAL/G)	194.87	168.08	144.95	115.45	9.78
GAMMA		3.225	3.081	2.884	2.751	2.99
C-J DETN.HEAT	(CAL)	346.6	345.3	344.0	342.9	3(.3
LAMDA		8.9649	8.9462	8.9289	8.9181	8.(06
VOLUM	(K LITTRE/KG)	0.8644	0.8654	0.8664	0.8670	0.(79
TOTAL PRODCT	(MOLE)	4.1511	4.1560	4.1606	4.1634	4.(81
V GAS	(MOLES)	4.1511	4.1560	4.1606	4.1634	4.(81
V GAS	(CC/MOLE)	15.4319	17.7857	20.9676	25.8697	33.(34
H2O	(MOL %)	40.9028	40.6163	40.3520	40.1882	39.(03
N2	(MOL %)	12.0422	12.0189	11.9877	11.9551	11.(12
H2	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.(00
O2	(MOL %)	27.7254	27.8026	27.8639	27.8878	27.(58
NH3	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.(00
OH	(MOL %)	0.0000	0.0000	0.0003	0.0017	0.(57
H	(MOL %)	0.0000	0.0000	0.0000	0.0000	0.(00


K-H-T C-J DETONATION PROPERTIES
DETONATION VELOCITY (M/SEC)
6000
5000
4000
3000
0.6
0.8
1.0
1.2
1.4
1.6
INITIAL DENSITY (G/CC)
DETONATION PRESSURE (KBAR)
100
0
INITIAL DENSITY (G/CC)
DETONATION TEMPERATURE (K)
2000
1000
INITIAL DENSITY (G/CC)
AMMONIUM PERCHLORATE
DATE 82-11-01

I E S <<DATE 82-11-02>> **********

H-6 RDX 45 TNT/30/AL20	#TORPEX RDX42 /TNT40/AL18	#PBXC-117 # RDX/AL/BINDE
1.710	1.810	1.750
-0.95	0.70	-7.26
100.000	100.000	100.008
1.8874	1.8000	1.6499
2.6058	2.0151	3.1378
1.6118	1.6629	1.9464
2.0081	2.1912	2.0475
0.7412	0.6671	0.6303
6743.9	7151.2	7376.0
1722.2	1834.9	1809.3
198.6	237.5	233.5
0.43546	0.41073	0.43126
5144.9	5368.6	4618.0
83.78	81.91	74.18
354.43	402.34	391.19
2.916	2.897	3.077
1971.1	1951.6	1831.0
7.4887	8.1217	7.5194
0.5010	0.5017	0.5831
4.1824	3.9289	4.2976
2.0477	2.0507	2.3835
13.6352	13.4527	12.5586
0.31121	0.29343	0.29175
0.23901	0.23645	0.23633
0.30285	0.29606	0.29671
18.2814	21.2846	24.3289
0.3556	2.1481	0.1889
2.2195	4.2936	0.8057
17.3157	20.4497	20.3284
6.2117	2.2196	4.8245
0.0005	0.0036	0.0002
3.8441	1.2451	4.5937
0.1518	0.2403	0.0902
0.1444	0.0742	0.0688
0.3720	0.0574	0.1917
0.0622	0.1787	0.0404
42.1795	39.3153	37.2053
8.8616	8.4899	7.3333
0.0	0.0	0.0



15 K
- EO
OUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N

ALEX 20 RDX/TNT

LN P = -3.74574375 E+00 -2.18852425 E+

LN T = 8.19817448 E+00 -3.23776662 E-

LN E = -1.65571785 E+00 4.05478239 E-
(P; MBARS, T; DEG KELVIN, V ; CC/G,
THE CONSTANT ADDED TO ENERGIES WAS 0.100

R T I E S <<DATE 82-11-02>> **********

PRESSURE (KBAR)	VOLUME (CC/G)	TEM (
500.000 (517.218)	0.3162	6463.
400.000 (400.685)	0.3424	6003.
300.000 (296.898)	0.3770	5564.
* 224.045 (222.270)	0.4151	5206.
200.000 (197.690)	0.4320	5118.
100.000 (98.684)	0.5540	4517.
80.000 (78.971)	0.6029	4332.
60.000 (59.339)	0.6745	4111.
50.000 (49.571)	0.7255	3984.
40.000 (39.832)	0.7947	3843.
30.000 (29.815)	0.9007	3685.
20.000 (20.199)	1.0750	3494.
10.000 (10.215)	1.5052	3232.
8.000 (8.168)	1.6948	3154.
6.000 (6.106)	1.9910	3059.
5.000 (5.075)	2.2145	2998.
4.000 (4.045)	2.5351	2927.
3.000 (3.017)	3.0420	2838.
2.000 (1.997)	3.9925	2714.
1.000 (0.989)	6.6152	2501.
0.800 (0.789)	7.8660	2434.
0.600 (0.590)	9.8941	2348.
0.500 (0.492)	11.4714	2293.
0.400 (0.393)	13.7921	2227.
0.300 (0.296)	17.5073	2140.
0.200 (0.199)	24.6760	2027.
0.100 (0.101)	44.6980	1847.
0.080 (0.081)	54.0971	1791.
0.060 (0.061)	69.2990	1723.
0.050 (0.051)	81.0847	1681.
0.040 (0.041)	98.2874	1632.
0.030 (0.030)	125.9833	1571.
0.020 (0.020)	178.8415	1490.
0.010 (0.010)	325.8918	1366.
0.008 (0.008)	396.1633	1331.
0.006 (0.006)	509.2253	1287.
0.005 (0.005)	597.0305	1261.
0.004 (0.004)	726.0674	1230.
0.003 (0.003)	932.9900	1192.
0.002 (0.002)	1333.9785	1143.

98.15 K
J) - EO
AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

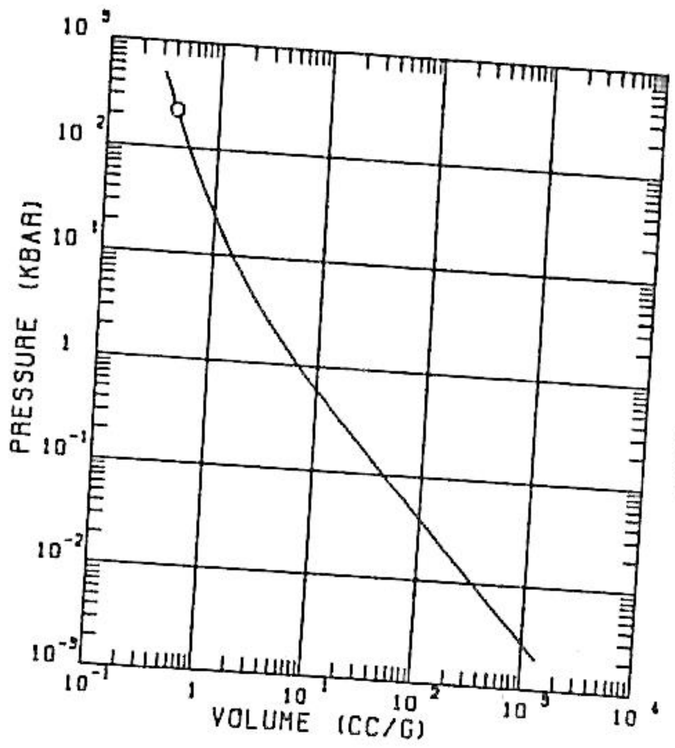
* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

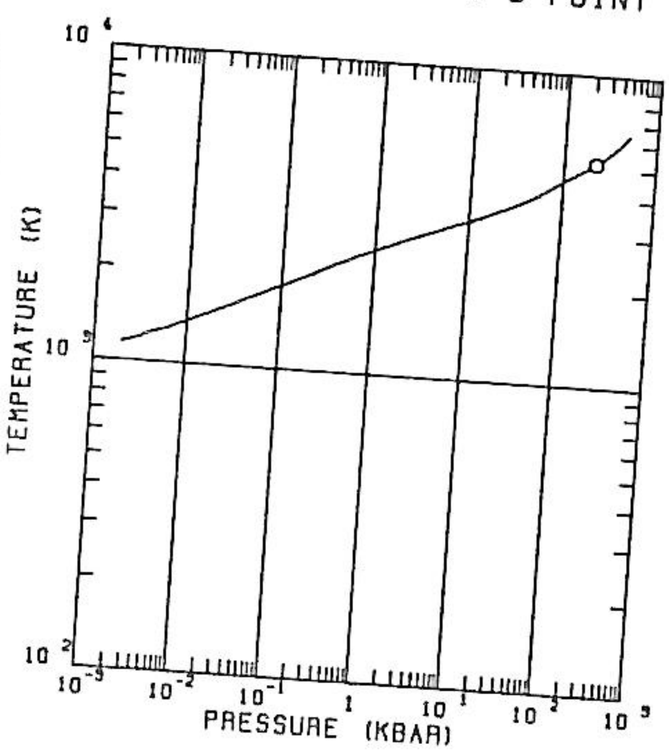
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

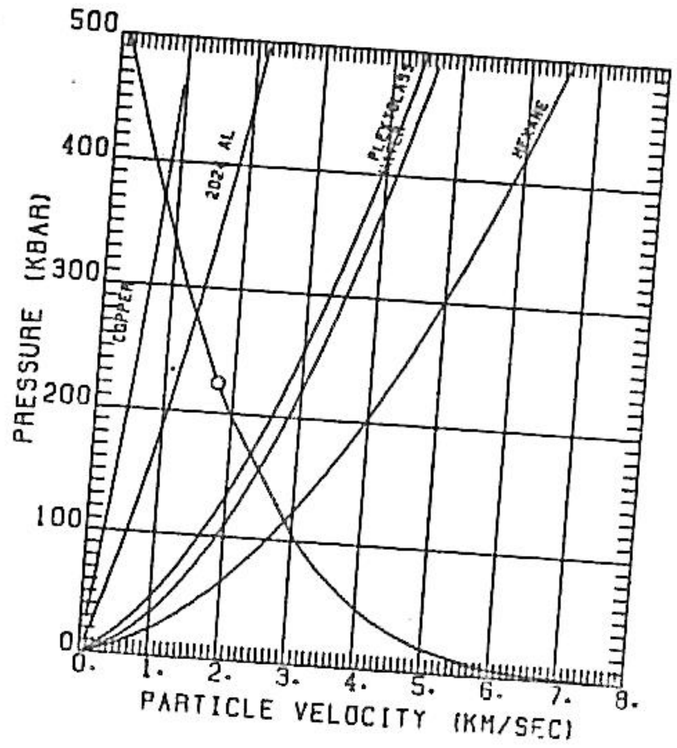
ALEX 20 RDX/TNT/AL/WAX RHO = 1.8010 G/CC EO = -6.601519E+02 CAL/MOLE

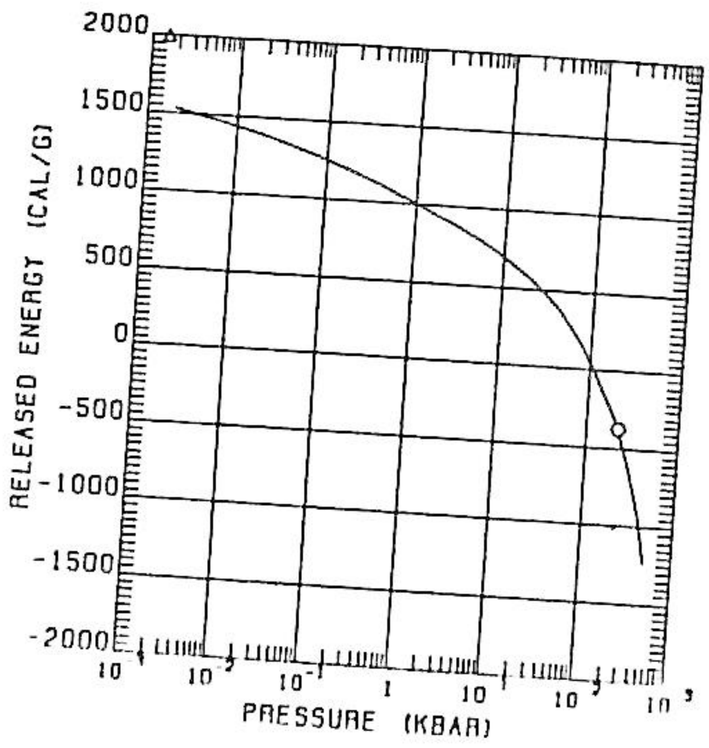
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

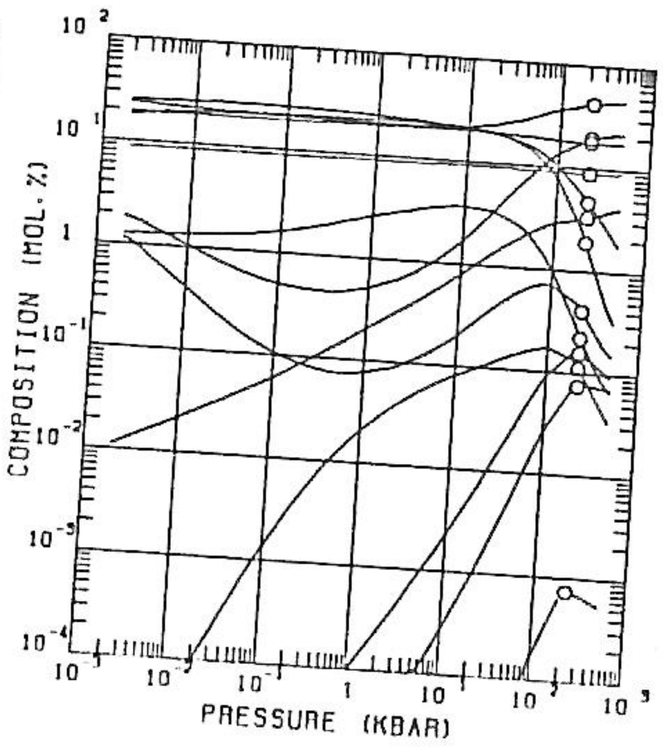
PRESS	H2O AL(S)	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	AL2O3(S)
224.045	0.81657 0.0	0.01698	0.07817	0.73684	0.19430	0.00003	0.13707	0.00653	0.00464	0.00928	0.00312	1.76625	0.36692
200.000	0.78488 0.0	0.01976	0.10401	0.73799	0.22376	0.00003	0.13481	0.00686	0.00550	0.01178	0.00306	1.73511	0.36692
100.000	0.55674 0.0	0.02911	0.31854	0.74803	0.42242	0.00001	0.11671	0.00381	0.00715	0.04045	0.00109	1.48257	0.36692
80.000	0.47614 0.0	0.02904	0.40078	0.75254	0.48805	0.00000	0.10809	0.00273	0.00690	0.05474	0.00069	1.38612	0.36692
60.000	0.37697 0.0	0.02713	0.50514	0.75901	0.56636	0.00000	0.09546	0.00171	0.00637	0.07503	0.00037	1.26338	0.36692
50.000	0.31979 0.0	0.02516	0.56683	0.76328	0.61057	0.00000	0.08704	0.00125	0.00597	0.08804	0.00025	1.19065	0.36692
40.000	0.25785 0.0	0.02231	0.63499	0.76844	0.65819	0.00000	0.07682	0.00085	0.00549	0.10309	0.00015	1.11029	0.36691
30.000	0.19479 0.0	0.01857	0.70592	0.77461	0.71032	0.00000	0.06455	0.00052	0.00493	0.11798	0.00009	1.02821	0.36691
20.000	0.12805 0.0	0.01366	0.78281	0.78209	0.76604	0.00000	0.04963	0.00026	0.00422	0.13492	0.00004	0.93932	0.36691
10.000	0.06697 0.0	0.00805	0.85532	0.79114	0.83646	0.00000	0.03156	0.00009	0.00327	0.14408	0.00001	0.86324	0.36691
8.000	0.05613 0.0	0.00693	0.86842	0.79321	0.85530	0.00000	0.02742	0.00007	0.00297	0.14327	0.00001	0.85208	0.36691
6.000	0.04567 0.0	0.00581	0.88120	0.79544	0.87823	0.00000	0.02297	0.00004	0.00262	0.14047	0.00000	0.84323	0.36689
5.000	0.04068 0.0	0.00526	0.88728	0.79663	0.89170	0.00000	0.02059	0.00003	0.00239	0.13807	0.00000	0.84009	0.36690
4.000	0.03567 0.0	0.00471	0.89345	0.79790	0.90790	0.00000	0.01805	0.00002	0.00214	0.13444	0.00000	0.83810	0.36689
3.000	0.03068 0.0	0.00414	0.89954	0.79928	0.92797	0.00000	0.01530	0.00002	0.00183	0.12905	0.00000	0.83797	0.36690
2.000	0.02572 0.0	0.00359	0.90558	0.80084	0.95469	0.00000	0.01218	0.00001	0.00143	0.12061	0.00000	0.84090	0.36691
1.000	0.02094 0.0	0.00311	0.91132	0.80277	0.99605	0.00000	0.00832	0.00000	0.00085	0.10535	0.00000	0.85092	0.36691
0.800	0.02001 0.0	0.00304	0.91240	0.80324	1.00859	0.00000	0.00737	0.00000	0.00070	0.10030	0.00000	0.85495	0.36691
0.600	0.01916 0.0	0.00300	0.91335	0.80378	1.02369	0.00000	0.00630	0.00000	0.00053	0.09402	0.00000	0.86032	0.36691
0.500	0.01886 0.0	0.00303	0.91364	0.80407	1.03220	0.00000	0.00572	0.00000	0.00044	0.09038	0.00000	0.86366	0.36690
0.400	0.01858 0.0	0.00307	0.91382	0.80439	1.04233	0.00000	0.00507	0.00000	0.00035	0.08596	0.00000	0.86783	0.36690
0.300	0.01873 0.0	0.00324	0.91331	0.80474	1.05248	0.00000	0.00437	0.00000	0.00025	0.08136	0.00000	0.87279	0.36691
0.200	0.01909 0.0	0.00353	0.91238	0.80516	1.06604	0.00000	0.00354	0.00000	0.00015	0.07505	0.00000	0.87973	0.36690
0.100	0.02079 0.0	0.00440	0.90895	0.80568	1.08293	0.00000	0.00251	0.00000	0.00006	0.06655	0.00000	0.89079	0.36690
0.080	0.02189 0.0	0.00488	0.90689	0.80580	1.08569	0.00000	0.00226	0.00000	0.00004	0.06481	0.00000	0.89410	0.36690
0.060	0.02343 0.0	0.00560	0.90388	0.80594	1.08894	0.00000	0.00197	0.00000	0.00003	0.06263	0.00000	0.89859	0.36691
0.050	0.02461 0.0	0.00615	0.90161	0.80602	1.09031	0.00000	0.00182	0.00000	0.00002	0.06148	0.00000	0.90146	0.36691
0.040	0.02627 0.0	0.00696	0.89835	0.80611	1.09133	0.00000	0.00164	0.00000	0.00001	0.06027	0.00000	0.90514	0.36691
0.030	0.02882 0.0	0.00825	0.89322	0.80621	1.09157	0.00000	0.00145	0.00000	0.00001	0.05902	0.00000	0.91022	0.36691
0.020	0.03328 0.0	0.01068	0.88383	0.80632	1.09001	0.00000	0.00122	0.00000	0.00000	0.05774	0.00000	0.91843	0.36692
0.010	0.04374 0.0	0.01725	0.86026	0.80647	1.08247	0.00000	0.00092	0.00000	0.00000	0.05651	0.00000	0.93666	0.36691
0.008	0.04735 0.0	0.01991	0.85135	0.80652	1.08036	0.00000	0.00084	0.00000	0.00000	0.05583	0.00000	0.94362	0.36691
0.006	0.05287 0.0	0.02420	0.83728	0.80656	1.07613	0.00000	0.00074	0.00000	0.00000	0.05525	0.00000	0.95396	0.36691
0.005	0.05677 0.0	0.02742	0.82689	0.80659	1.07290	0.00000	0.00069	0.00000	0.00000	0.05495	0.00000	0.96143	0.36693
0.004	0.06156 0.0	0.03168	0.81361	0.80662	1.06932	0.00000	0.00063	0.00000	0.00000	0.05440	0.00000	0.97102	0.36691
0.003	0.06903 0.0	0.03861	0.79228	0.80666	1.06253	0.00000	0.00056	0.00000	0.00000	0.05411	0.00000	0.98570	0.36691
0.002	0.07876 0.0	0.04907	0.76161	0.80670	1.05553	0.00000	0.00047	0.00000	0.00000	0.05281	0.00000	1.00722	0.36691
300.000	0.86802 0.0	0.01136	0.03891	0.73230	0.13795	0.00003	0.14614	0.00556	0.00303	0.00557	0.00312	1.81483	0.36692
400.000	0.89616 0.0	0.00755	0.01951	0.72636	0.09694	0.00002	0.15811	0.00455	0.00196	0.00355	0.00302	1.84006	0.36692
500.000	0.90624 0.0	0.00623	0.01285	0.72123	0.07340	0.00000	0.16408	0.00396	0.00135	0.00258	0.00301	1.85284	0.36692











ALEX 20 RDX/TNT/AL/WAX

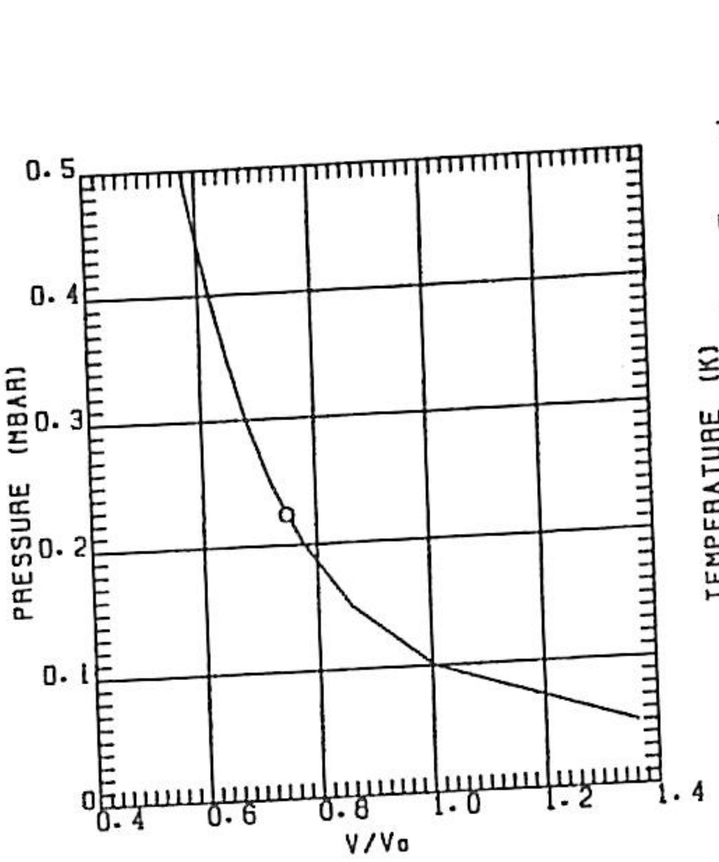
RHO (G/CC)	1.801
E_0 (KCAL/MOLE)	0.66
D_{C-J} (M/SEC)	7024.
P_{C-J} (KBAR)	224.0
T_{C-J} (K)	5206.

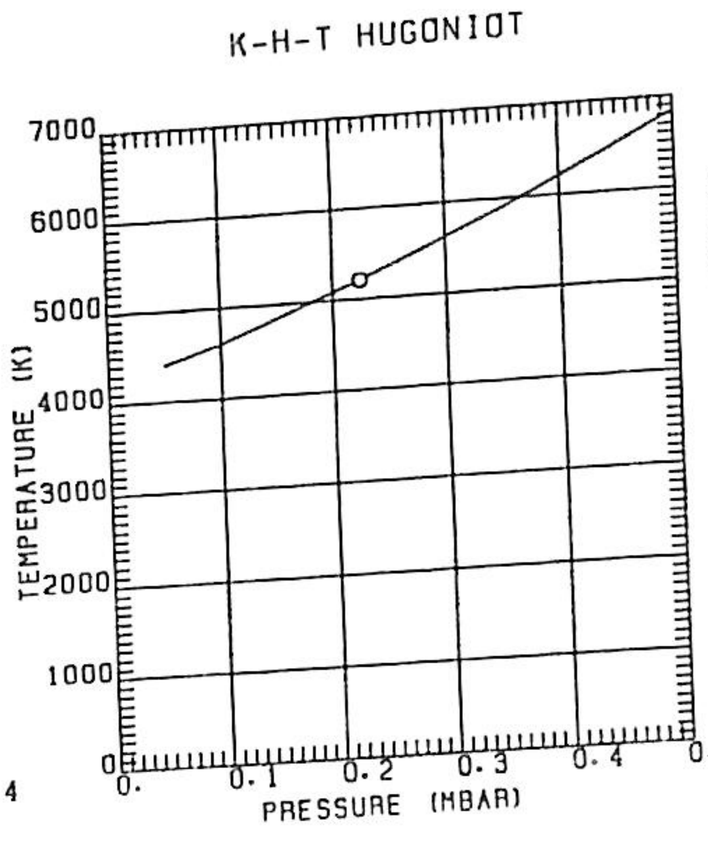
DATE 82-11-02

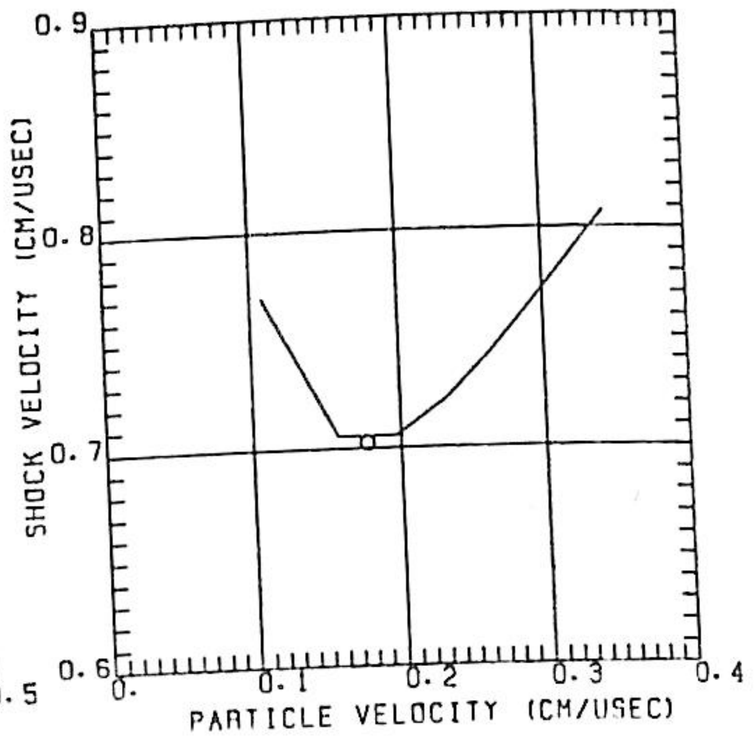
********** A K-H-T H U G O N I O T <<DATE 82-11-02>>**********

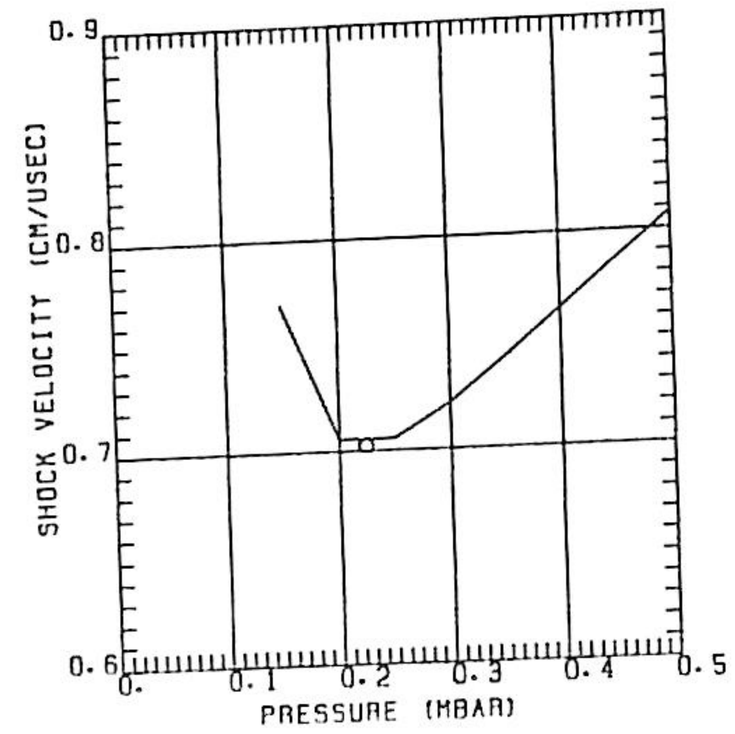
ALEX 20 RDX/TNT/AL/WAX RHO = 1.8010 G/CC, EO = -6.601519E+02 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3190	0.3309	0.3441	0.3594	0.3776	0.4005	0.4314	0.4772	0.5581	0.7578
TEMP (DEG K)	6843.0	6511.4	6195.8	5896.1	5611.8	5341.8	5082.8	4839.3	4600.5	4391.0
US (M/SEC)	8077.4	7863.6	7642.7	7422.0	7215.5	7058.0	7055.1	7698.3	0.0	0.0
UP (M/SEC)	3437.0	3177.5	2906.0	2618.4	2308.5	1966.7	1574.0	1081.9	0.0	0.0
H2O (MOLE)	0.8968	0.8946	0.8898	0.8810	0.8656	0.8381	0.7882	0.7015	0.5365	0.2326
CO2 (MOLE)	0.0084	0.0084	0.0088	0.0099	0.0118	0.0149	0.0194	0.0251	0.0290	0.0191
CO (MOLE)	0.0175	0.0195	0.0231	0.0294	0.0405	0.0612	0.1014	0.1784	0.3385	0.6652
N2 (MOLE)	0.7205	0.7232	0.7260	0.7290	0.7321	0.7353	0.7382	0.7417	0.7475	0.7641
H2 (MOLE)	0.0794	0.0889	0.1011	0.1173	0.1395	0.1718	0.2218	0.3001	0.4368	0.6851
O2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.1697	0.1644	0.1588	0.1528	0.1464	0.1401	0.1344	0.1282	0.1176	0.0852
OH (MOLE)	0.0042	0.0044	0.0047	0.0051	0.0056	0.0062	0.0069	0.0060	0.0042	0.0021
H (MOLE)	0.0015	0.0018	0.0021	0.0025	0.0031	0.0040	0.0055	0.0067	0.0082	0.0124
CH4 (MOLE)	0.0035	0.0037	0.0041	0.0047	0.0058	0.0077	0.0114	0.0202	0.0423	0.0939
NO (MOLE)	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031	0.0022	0.0012	0.0005
C(S) (MOLE)	1.8412	1.8390	1.8347	1.8267	1.8126	1.7869	1.7384	1.6469	1.4608	1.0925
AL2O3(S) (MOLE)	0.3669	0.3669	0.3669	0.3669	0.3669	0.3669	0.3669	0.3669	0.3669	0.3669
AL(S) (MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0









ALEX 20 RDX/TNT/AL/WAX
RHO (G/CC) 1.801
E_0 (KCAL/MOLE) -0.66

DATE 82-11-02

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 83-01-20>> **********

ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC EO = -8.874150E+02 CAL/MOLE

LN P = -4.12160778 E+00 -2.12005424 E+00LN V 4.63086784 E-01LN V*2 -8.07328820 E-02LN V*3 4.77419049 E-03LN V*4

LN T = 8.54340363 E+00 -1.48245454 E-01LN V 3.60136703 E-02LN V*2 -7.11135194 E-03LN V*3 4.55595786 E-04LN V*4

LN E = -1.80416584 E+00 2.79265642 E-01LNP 4.48763035 E-02LN P*2 4.11340594 E-03LN P*3 1.29652850 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (379.022)	0.3194	6855.3 (6443.9)	-876.1	0.13665 (0.13193)	3.5212	0.0
300.000 (279.080)	0.3490	6434.8 (6299.7)	-599.1	0.12507 (0.12465)	3.3859	536.5
200.000 (187.957)	0.3934	6039.0 (6119.1)	-327.0	0.11368 (0.11606)	3.2104	1205.8
* 171.217 (162.750)	0.4116	5923.9 (6054.9)	-246.1	0.11030 (0.11320)	3.1463	1435.0
100.000 (99.633)	0.4839	5726.6 (5842.1)	-80.0	0.10335 (0.10479)	2.9274	2106.5
80.000 (81.652)	0.5184	5647.2 (5758.5)	-19.8	0.10083 (0.10185)	2.8384	2355.6
60.000 (63.071)	0.5689	5555.6 (5652.2)	47.6	0.09801 (0.09846)	2.7229	2661.3
50.000 (53.437)	0.6051	5497.9 (5585.3)	87.4	0.09634 (0.09650)	2.6488	2848.0
40.000 (43.426)	0.6553	5430.7 (5502.9)	131.9	0.09448 (0.09429)	2.5562	3072.0
30.000 (32.719)	0.7342	5343.8 (5393.1)	185.1	0.09226 (0.09169)	2.4300	3361.9
20.000 (21.899)	0.8716	5220.1 (5242.1)	255.6	0.08931 (0.08841)	2.2520	3745.8
10.000 (10.502)	1.2395	4988.2 (4979.9)	372.4	0.08442 (0.08358)	1.9322	4383.1
8.000 (8.235)	1.4106	4921.8 (4897.0)	405.7	0.08302 (0.08217)	1.8293	4579.6
6.000 (6.012)	1.6862	4834.1 (4792.4)	448.6	0.08123 (0.08044)	1.6995	4826.4
5.000 (4.926)	1.9013	4776.9 (4727.8)	475.9	0.08009 (0.07937)	1.6199	4979.0
4.000 (3.863)	2.2194	4707.0 (4650.3)	508.7	0.07872 (0.07809)	1.5259	5162.5
3.000 (2.832)	2.7416	4615.6 (4553.7)	550.7	0.07696 (0.07648)	1.4127	5393.6
2.000 (1.848)	3.7713	4484.1 (4424.3)	609.9	0.07448 (0.07424)	1.2727	5709.6
1.000 (0.924)	6.7907	4256.8 (4220.6)	710.5	0.07027 (0.07047)	1.1004	6226.6
0.800 (0.747)	8.2675	4183.5 (4158.9)	742.7	0.06892 (0.06926)	1.0644	6388.0
0.600 (0.571)	10.6933	4091.7 (4080.9)	783.0	0.06724 (0.06769)	1.0313	6594.2
0.500 (0.482)	12.6031	4033.9 (4032.2)	808.4	0.06618 (0.06669)	1.0176	6723.9
0.400 (0.393)	15.4302	3964.9 (3972.9)	838.7	0.06491 (0.06546)	1.0079	6882.6
0.300 (0.302)	20.0558	3877.6 (3896.4)	877.1	0.06330 (0.06388)	1.0057	7087.3
0.200 (0.207)	29.0646	3757.9 (3787.5)	929.7	0.06110 (0.06164)	1.0186	7377.2
0.100 (0.107)	54.9340	3562.0 (3596.2)	1016.1	0.05748 (0.05783)	1.0689	7879.1
0.080 (0.086)	67.4493	3501.3 (3533.2)	1042.9	0.05636 (0.05662)	1.0888	8041.8
0.060 (0.064)	87.8999	3424.9 (3451.3)	1076.7	0.05495 (0.05507)	1.1144	8251.7
0.050 (0.053)	103.9643	3377.3 (3399.2)	1097.8	0.05407 (0.05411)	1.1297	8384.4
0.040 (0.042)	127.6853	3320.1 (3335.5)	1123.1	0.05301 (0.05295)	1.1466	8546.0
0.030 (0.031)	166.4297	3247.8 (3253.8)	1155.1	0.05167 (0.05149)	1.1637	8752.4
0.020 (0.020)	241.7976	3148.6 (3141.1)	1199.0	0.04983 (0.04951)	1.1753	9037.7
0.010 (0.009)	457.8987	2986.0 (2961.6)	1271.0	0.04682 (0.04641)	1.1452	9503.7
0.008 (0.008)	562.5083	2936.0 (2909.1)	1293.0	0.04590 (0.04550)	1.1180	9646.8
0.006 (0.006)	733.2273	2872.2 (2846.8)	1321.2	0.04472 (0.04440)	1.0678	9825.7
0.005 (0.005)	867.3687	2832.6 (2810.7)	1338.7	0.04399 (0.04375)	1.0263	9935.8
0.004 (0.004)	1065.3333	2784.7 (2770.9)	1359.8	0.04311 (0.04300)	0.9642	10066.8
0.003 (0.003)	1388.6079	2724.0 (2727.3)	1386.4	0.04199 (0.04214)	0.8644	10229.6
0.002 (0.002)	2017.2896	2640.6 (2683.4)	1423.0	0.04046 (0.04111)	0.6822	10446.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 83-01-20>> **********

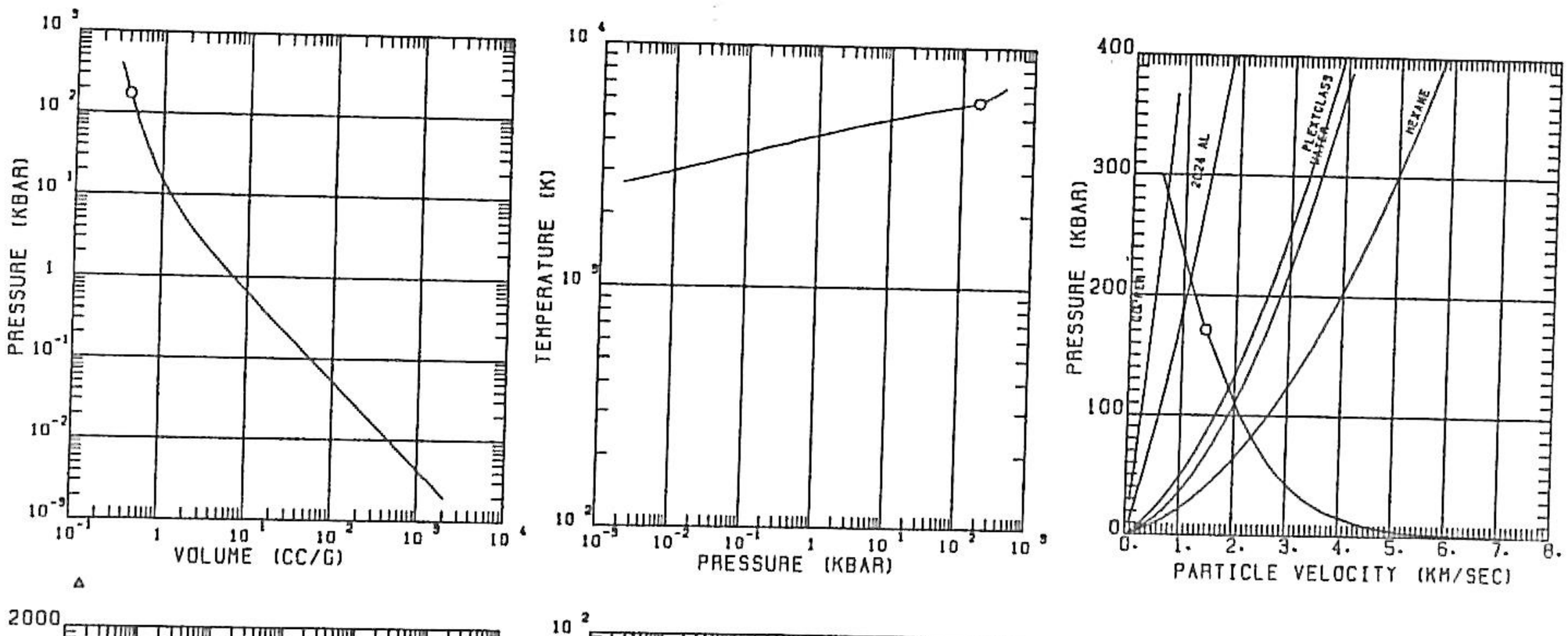
ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC ED = -8.874150E+02 CAL/MOLE

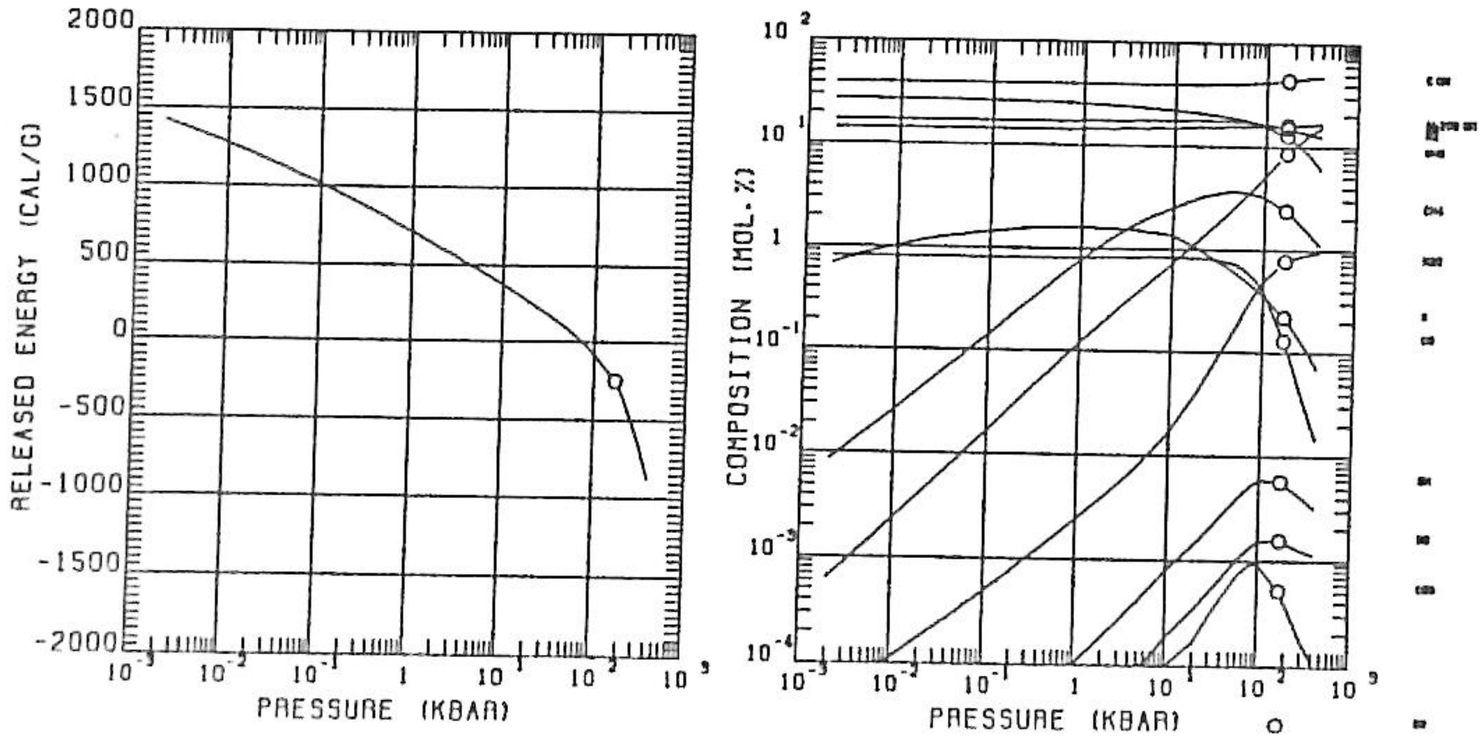
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	AL2O3(S)
171.217	0.02740	0.00002	0.00467	0.53777	0.44965	0.00000	0.30186	0.00021	0.00790	0.08457	0.00006	1.55667	0.57076
100.000	0.01777	0.00003	0.01425	0.59561	0.56879	0.00000	0.18619	0.00021	0.01315	0.11525	0.00005	1.51639	0.57076
80.000	0.01332	0.00003	0.01874	0.61274	0.60643	0.00000	0.15193	0.00019	0.01561	0.12375	0.00005	1.50340	0.57076
60.000	0.00861	0.00003	0.02351	0.63005	0.64757	0.00000	0.11733	0.00015	0.01906	0.13063	0.00004	1.49176	0.57076
50.000	0.00643	0.00002	0.02573	0.63873	0.67075	0.00000	0.09997	0.00013	0.02142	0.13256	0.00003	1.48761	0.57076
40.000	0.00448	0.00002	0.02772	0.64745	0.69717	0.00000	0.08254	0.00010	0.02455	0.13262	0.00003	1.48557	0.57076
30.000	0.00288	0.00001	0.02937	0.65618	0.73041	0.00000	0.06507	0.00008	0.02905	0.12879	0.00002	1.48776	0.57076
20.000	0.00159	0.00001	0.03070	0.66527	0.77351	0.00000	0.04690	0.00005	0.03640	0.11969	0.00001	1.49553	0.57076
10.000	0.00065	0.00000	0.03167	0.67503	0.84346	0.00000	0.02740	0.00003	0.05180	0.09595	0.00001	1.51830	0.57076
8.000	0.00052	0.00000	0.03181	0.67707	0.86165	0.00000	0.02330	0.00003	0.05367	0.08954	0.00001	1.52457	0.57076
6.000	0.00040	0.00000	0.03195	0.67926	0.88454	0.00000	0.01893	0.00002	0.05583	0.08090	0.00000	1.53308	0.57076
5.000	0.00034	0.00000	0.03201	0.68043	0.89871	0.00000	0.01658	0.00002	0.05701	0.07530	0.00000	1.53861	0.57076
4.000	0.00028	0.00000	0.03208	0.68169	0.91569	0.00000	0.01408	0.00001	0.05841	0.06837	0.00000	1.54548	0.57076
3.000	0.00022	0.00000	0.03214	0.68305	0.93675	0.00000	0.01136	0.00001	0.05999	0.05951	0.00000	1.55427	0.57076
2.000	0.00016	0.00000	0.03221	0.68457	0.96422	0.00000	0.00832	0.00001	0.06176	0.04765	0.00000	1.56607	0.57076
1.000	0.00010	0.00000	0.03228	0.68635	1.00277	0.00000	0.00475	0.00000	0.06339	0.03067	0.00000	1.58298	0.57076
0.800	0.00008	0.00000	0.03229	0.68675	1.01267	0.00000	0.00395	0.00000	0.06345	0.02632	0.00000	1.58731	0.57076
0.600	0.00007	0.00000	0.03231	0.68718	1.02367	0.00000	0.00310	0.00000	0.06342	0.02147	0.00000	1.59215	0.57076
0.500	0.00006	0.00000	0.03232	0.68740	1.02974	0.00000	0.00266	0.00000	0.06320	0.01883	0.00000	1.59478	0.57076
0.400	0.00005	0.00000	0.03233	0.68763	1.03626	0.00000	0.00220	0.00000	0.06286	0.01600	0.00000	1.59760	0.57076
0.300	0.00004	0.00000	0.03234	0.68787	1.04344	0.00000	0.00172	0.00000	0.06221	0.01294	0.00000	1.60064	0.57076
0.200	0.00003	0.00000	0.03236	0.68812	1.05160	0.00000	0.00121	0.00000	0.06089	0.00958	0.00000	1.60400	0.57076
0.100	0.00002	0.00000	0.03237	0.68840	1.06177	0.00000	0.00067	0.00000	0.05764	0.00571	0.00000	1.60784	0.57076
0.080	0.00002	0.00000	0.03238	0.68845	1.06433	0.00000	0.00055	0.00000	0.05638	0.00484	0.00000	1.60871	0.57076
0.060	0.00001	0.00000	0.03238	0.68851	1.06725	0.00000	0.00043	0.00000	0.05462	0.00391	0.00000	1.60964	0.57076
0.050	0.00001	0.00000	0.03239	0.68855	1.06893	0.00000	0.00037	0.00000	0.05342	0.00342	0.00000	1.61013	0.57076
0.040	0.00001	0.00000	0.03239	0.68858	1.07083	0.00000	0.00030	0.00000	0.05189	0.00290	0.00000	1.61064	0.57076
0.030	0.00001	0.00000	0.03239	0.68861	1.07307	0.00000	0.00024	0.00000	0.04981	0.00235	0.00000	1.61119	0.57076
0.020	0.00001	0.00000	0.03240	0.68865	1.07594	0.00000	0.00017	0.00000	0.04669	0.00175	0.00000	1.61178	0.57076
0.010	0.00000	0.00000	0.03240	0.68868	1.08027	0.00000	0.00009	0.00000	0.04098	0.00107	0.00000	1.61246	0.57076
0.008	0.00000	0.00000	0.03241	0.68869	1.08152	0.00000	0.00008	0.00000	0.03916	0.00091	0.00000	1.61261	0.57076
0.006	0.00000	0.00000	0.03241	0.68870	1.08310	0.00000	0.00006	0.00000	0.03671	0.00074	0.00000	1.61278	0.57076
0.005	0.00000	0.00000	0.03241	0.68870	1.08407	0.00000	0.00005	0.00000	0.03516	0.00065	0.00000	1.61287	0.57076
0.004	0.00000	0.00000	0.03241	0.68871	1.08522	0.00000	0.00004	0.00000	0.03326	0.00056	0.00000	1.61296	0.57076
0.003	0.00000	0.00000	0.03242	0.68871	1.08665	0.00000	0.00004	0.00000	0.03082	0.00046	0.00000	1.61305	0.57076
0.002	0.00000	0.00000	0.03242	0.68872	1.08858	0.00000	0.00003	0.00000	0.02743	0.00035	0.00000	1.61316	0.57076
200.000	0.02897	0.00001	0.00313	0.51756	0.40696	0.00000	0.34228	0.00019	0.00660	0.07515	0.00005	1.56763	0.57076
300.000	0.03114	0.00001	0.00103	0.46198	0.28701	0.00000	0.45344	0.00014	0.00380	0.05138	0.00004	1.59350	0.57076
400.000	0.03171	0.00000	0.00050	0.42614	0.20645	0.00000	0.52512	0.00011	0.00240	0.03797	0.00004	1.60745	0.57076

PRESS ;KBAR, PRODUCTS ;MOLES

K-H-T ISENTROPE THRU C-J POINT





ALEX 32 RDX/TNT/AL/WAX

RHO (G/CC)	1.880
E_0 (KCAL/MOLE)	-0.89
D_{C-J} (M/SEC)	6347.
P_{C-J} (KBAR)	171.2
T_{C-J} (K)	5924.

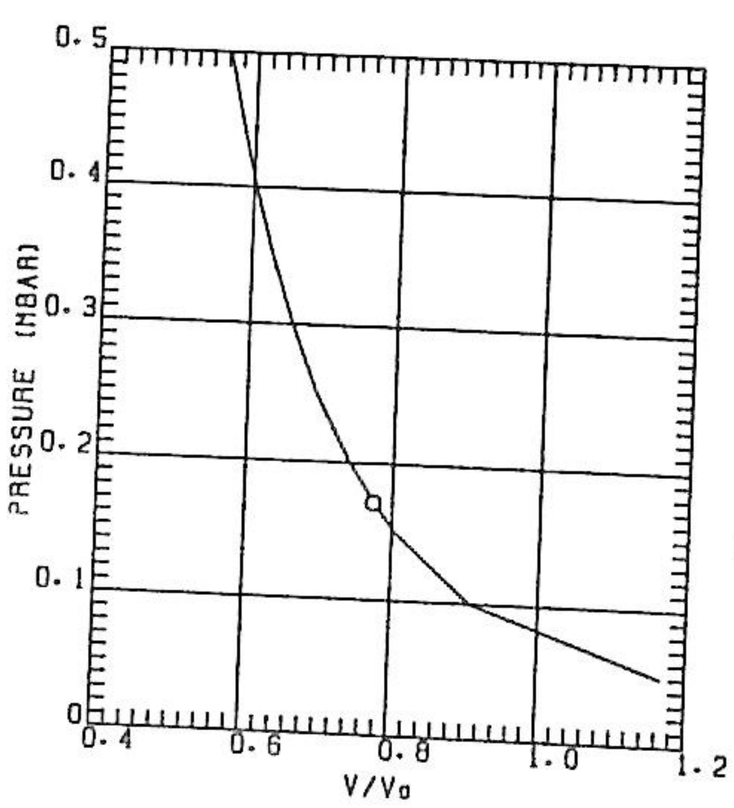
DATE 83-01-20

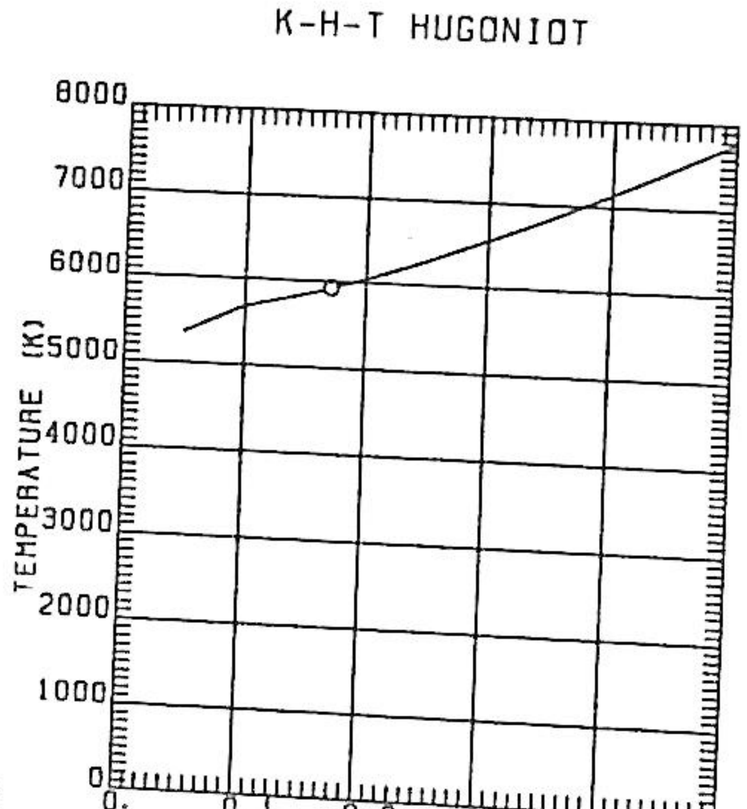
********** A K-H-T H U G O N I O T <<DATE 82-11-02>>**********

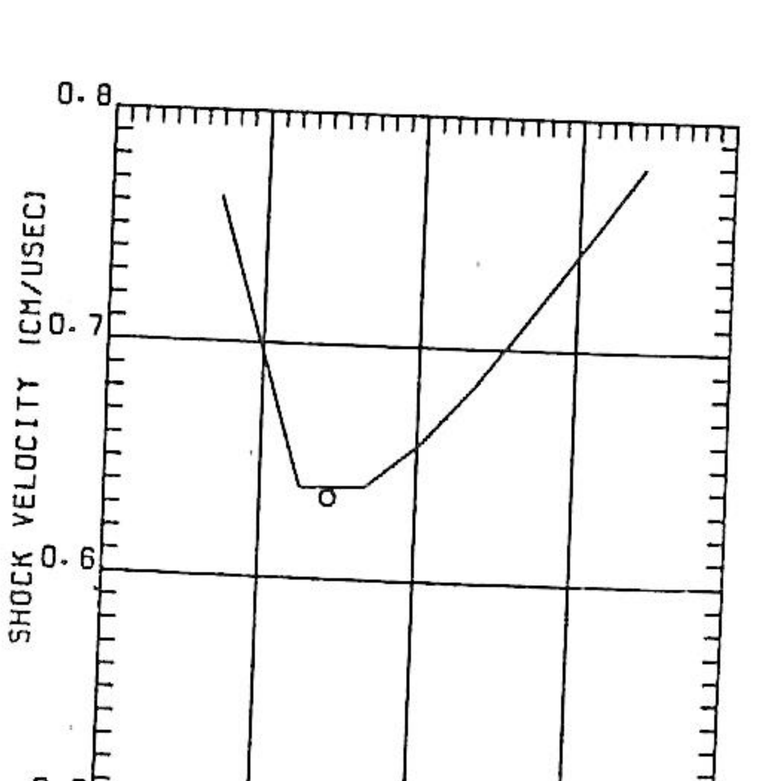
ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC, EO = -8.874150E+02 CAL/MOLE

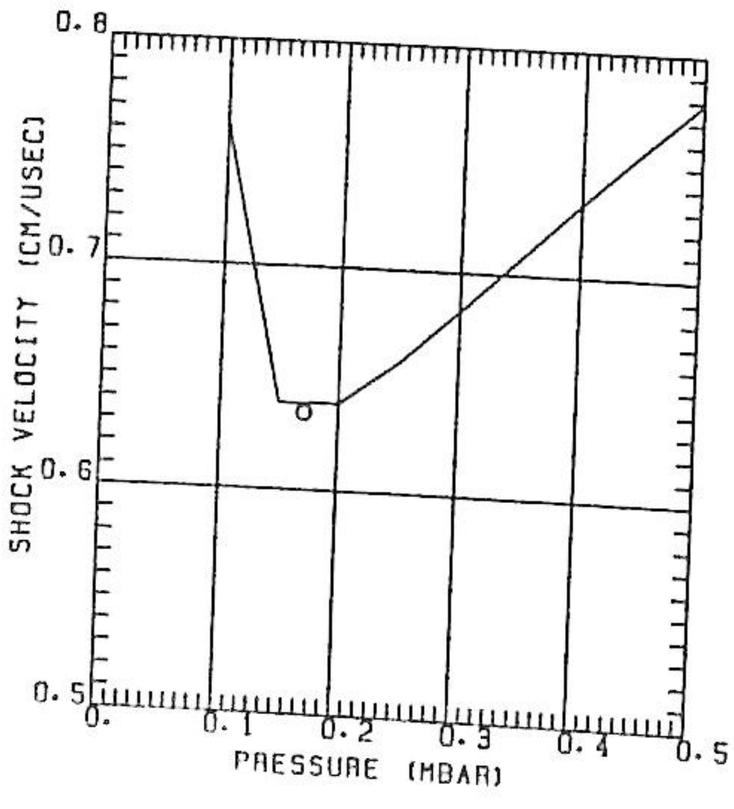
PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.2990	0.3094	0.3210	0.3342	0.3498	0.3688	0.3935	0.4279	0.4832	0.6208
TEMP	(DEG K)	7778.6	7446.9	7130.8	6830.7	6547.9	6285.3	6047.2	5841.0	5679.5	5362.2
US	(M/SEC)	7794.1	7564.6	7325.0	7077.0	6826.3	6586.0	6393.4	6387.2	7619.4	0.0
UP	(M/SEC)	3412.3	3164.2	2904.6	2630.6	2337.6	2019.1	1663.9	1249.2	698.1	0.0
H2O	(MOLE)	0.0318	0.0317	0.0316	0.0314	0.0310	0.0304	0.0289	0.0256	0.0180	0.0256
CO2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003
CO	(MOLE)	0.0004	0.0005	0.0006	0.0008	0.0011	0.0018	0.0031	0.0064	0.0141	0.1041
N2	(MOLE)	0.4103	0.4190	0.4305	0.4451	0.4639	0.4878	0.5177	0.5539	0.5953	0.6409
H2	(MOLE)	0.1626	0.1846	0.2121	0.2463	0.2890	0.3421	0.4070	0.4835	0.5697	0.6747
O2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.5567	0.5393	0.5165	0.4871	0.4496	0.4018	0.3420	0.2696	0.1869	0.0956
OH	(MOLE)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0005
H	(MOLE)	0.0018	0.0021	0.0025	0.0031	0.0039	0.0050	0.0066	0.0091	0.0131	0.0221
CH4	(MOLE)	0.0363	0.0383	0.0417	0.0465	0.0533	0.0626	0.0753	0.0925	0.1142	0.1240
NO	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001
C(S)	(MOLE)	1.6092	1.6071	1.6036	1.5986	1.5915	1.5816	1.5674	1.5470	1.5176	1.4175
AL2O3(S)	(MOLE)	0.5708	0.5708	0.5708	0.5708	0.5708	0.5708	0.5708	0.5708	0.5708	0.5378
AL(S)	(MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0658

K-H-T HUGONIOT









ALEX 32 RDX/TNT/AL/WAX
RHO (G/CC) 1.880
E_0 (KCAL/MOLE) -0.89

DATE 82-11-02

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

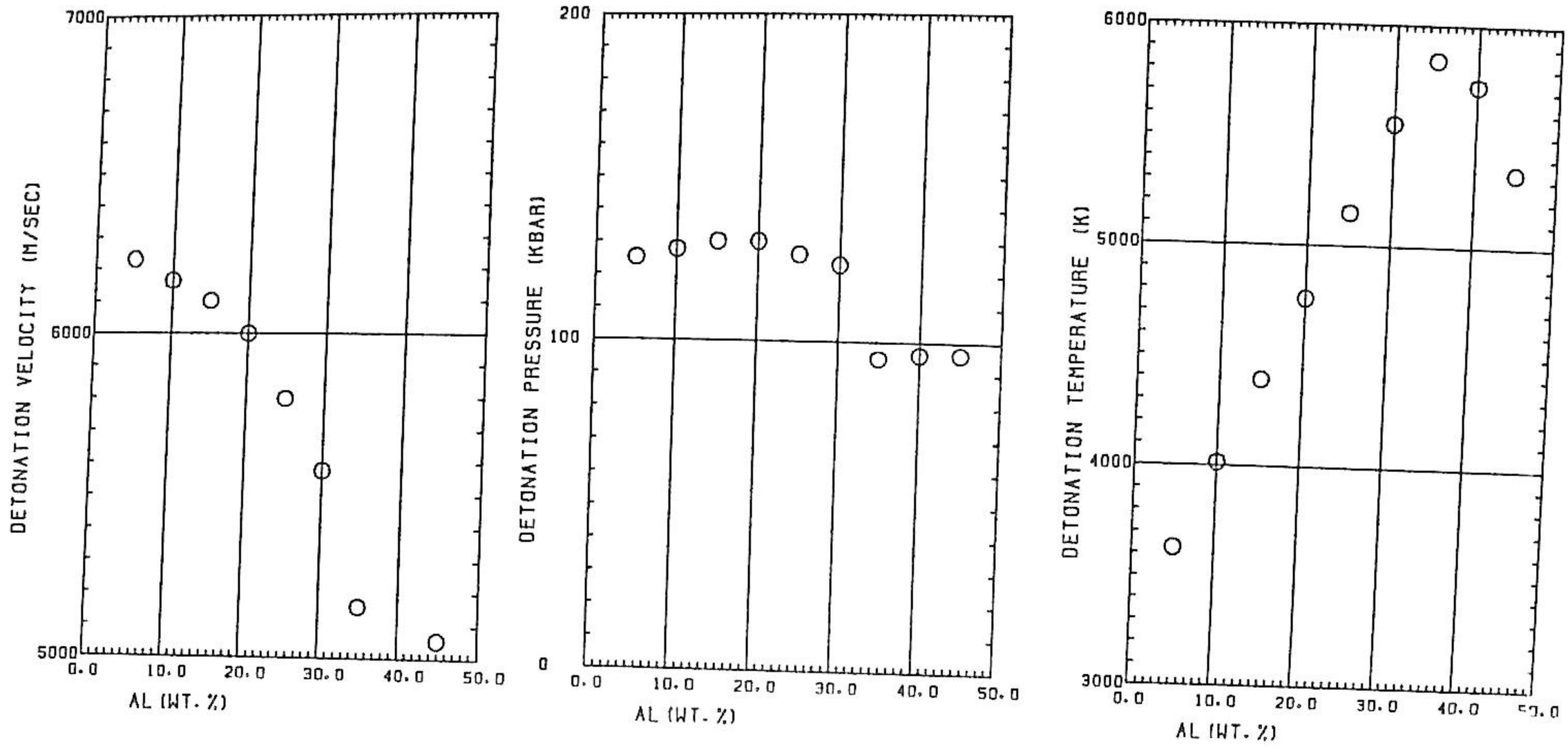
EXPLOSIVES		NM(GEL) 95 AL 5	#NM(GEL) 90 AL.10	#NM(GEL) 85 AL 15	#NM(GEL) 80 AL 20	#NM(GEL) 75 AL 25	#NM(GEL) 70 AL 30	#NM(GEL) 65 AL 35	#
RHO	(G/CC)	1.180	1.210	1.251	1.292	1.322	1.382	1.432	
EO	(KCAL/MOLE)	-44.28	-44.28	-44.28	-44.28	-44.28	-44.28	-44.28	
MOL.WEIGHT	(G)	108.421	114.444	121.176	128.750	137.333	147.143	158.461	
C		1.8504	1.8504	1.8504	1.8504	1.8504	1.8504	1.8504	
H		5.2669	5.2669	5.2669	5.2669	5.2669	5.2669	5.2669	
N		1.6047	1.6047	1.6047	1.6047	1.6047	1.6047	1.6047	
O		3.3119	3.3119	3.3119	3.3119	3.3119	3.3119	3.3119	
AL		0.2009	0.4242	0.6737	0.9544	1.2725	1.6360	2.0555	
DETN.VEL	(M/SEC)	6230.9	6163.7	6101.0	5998.5	5796.3	5577.1	5158.3	
PARTICL.VEL(	")	1701.4	1711.1	1703.7	1678.3	1648.9	1598.7	1283.8	
C-J PRESS	(KBAR)	125.1	127.6	130.0	130.1	126.4	123.2	94.8	
C-J VOLUME	(CC/G)	0.61606	0.59701	0.57614	0.55744	0.54125	0.51617	0.52453	
C-J TEMP	(DEG K)	3625.3	4012.2	4387.9	4757.4	5147.9	5553.7	5842.2	
C-J S	(CAL/DEG MOL)	57.89	61.41	65.39	69.99	75.85	84.83	95.27	
C-J ENERGY	(CAL/G)	345.91	349.82	346.82	336.54	324.88	305.48	196.95	
GAMMA		2.662	2.602	2.581	2.574	2.515	2.488	3.018	
C-J DETN.HEAT	(CAL)	1446.1	1595.1	1747.7	1901.9	2064.1	2248.2	2430.3	
LAMDA		7.4047	7.2223	7.0501	6.8788	6.7118	6.5696	6.3892	
VOLUM(K LITTRE	/KG)	0.8726	0.8101	0.7454	0.6798	0.6100	0.5257	0.4472	
TOTAL PRODCT	(MOLE)	5.3149	5.3642	5.4010	5.4258	5.4314	5.4010	5.3537	
V GAS	(MOLES)	3.8672	3.7898	3.6919	3.5775	3.4245	3.1620	2.8966	
V GAS	(CC/MOLE)	15.1918	15.1552	15.1069	15.1512	15.3905	15.6452	17.5258	
V C(S)	(CC/G)	0.34305	0.34386	0.34469	0.34696	0.35177	0.35642	0.37854	
V AL2O3(S)	(CC/G)	0.24339	0.24342	0.24344	0.24364	0.24411	0.24455	0.24673	
V AL(S)	(CC/G)	0.39205	0.39986	0.40744	0.41558	0.42538	0.43539	0.45190	
H2O	(MOL %)	43.5457	38.7214	32.8712	25.9996	18.4761	11.1673	2.3762	
CO2	(MOL %)	3.6909	2.2637	1.3703	0.8033	0.4264	0.1576	0.0134	
CO	(MOL %)	5.6512	6.5130	6.8184	6.8128	6.2790	4.2702	1.8351	
N2	(MOL %)	14.5190	13.9727	13.3679	12.7467	12.2016	11.7151	11.8873	
H2	(MOL %)	4.0033	6.7332	10.0088	13.8164	17.8024	20.8794	25.1985	
O2	(MOL %)	0.0002	0.0003	0.0004	0.0005	0.0003	0.0001	0.0000	
NH3	(MOL %)	1.1403	1.9455	2.9405	4.0388	5.1030	6.2600	6.1945	
OH	(MOL %)	0.0497	0.0936	0.1456	0.1936	0.1881	0.1107	0.0276	
H	(MOL %)	0.0216	0.0601	0.1345	0.2631	0.4070	0.4408	0.5501	
CH4	(MOL %)	0.1267	0.3216	0.6637	1.2165	2.1275	3.5229	6.0172	
NO	(MOL %)	0.0141	0.0240	0.0345	0.0429	0.0386	0.0206	0.0047	
C(S)	(MOL %)	25.3468	25.3971	25.4079	25.2713	25.2359	26.3096	26.6978	
AL2O3(S)	(MOL %)	1.8905	3.9538	6.2364	8.7945	11.7141	15.1456	19.1975	
AL(S)	(MOL %)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES		NM(GEL) 60 AL 40	#NM(GEL) 55 AL 45	#
RHO	(G/CC)	1.472	1.543	
EO	(KCAL/MOLE)	-44.28	-44.28	
MOL.WEIGHT	(G)	171.667	187.273	
C		1.8504	1.8504	
H		5.2669	5.2669	
N		1.6047	1.6047	
O		3.3119	3.3119	
AL		2.5450	3.1234	
DETN.VEL	(M/SEC)	4992.9	5056.1	
PARTICL.VEL(	")	1307.5	1232.8	
C-J PRESS	(KBAR)	96.1	96.2	
C-J VOLUME	(CC/G)	0.50145	0.49007	
C-J TEMP	(DEG K)	5727.5	5333.6	
C-J S	(CAL/DEG MOL)	103.66	108.12	
C-J ENERGY	(CAL/G)	204.29	181.63	
GAMMA		2.819	3.101	
C-J DETN.HEAT	(CAL)	2350.3	2156.5	
LAMDA		6.2948	6.2124	
VOLUM(K LITTRE	/KG)	0.3937	0.3617	
TOTAL PRODCT	(MOLE)	5.7126	6.3249	
V GAS	(MOLES)	2.7624	2.7690	
V GAS	(CC/MOLE)	17.1865	16.7336	
V C(S)	(CC/G)	0.37669	0.37362	
V AL2O3(S)	(CC/G)	0.24658	0.24636	
V AL(S)	(CC/G)	0.44882	0.43986	
H2O	(MOL %)	0.3336	0.2518	
CO2	(MOL %)	0.0002	0.0001	
CO	(MOL %)	0.2186	0.1317	
N2	(MOL %)	10.8833	9.7117	
H2	(MOL %)	24.1489	22.3149	
O2	(MOL %)	0.0000	0.0000	
NH3	(MOL %)	6.3230	5.9471	
OH	(MOL %)	0.0037	0.0026	
H	(MOL %)	0.5055	0.4597	
CH4	(MOL %)	5.9386	4.9588	
NO	(MOL %)	0.0006	0.0004	
C(S)	(MOL %)	26.2341	24.1652	
AL2O3(S)	(MOL %)	19.1396	17.3255	
AL(S)	(MOL %)	6.2703	14.7305	

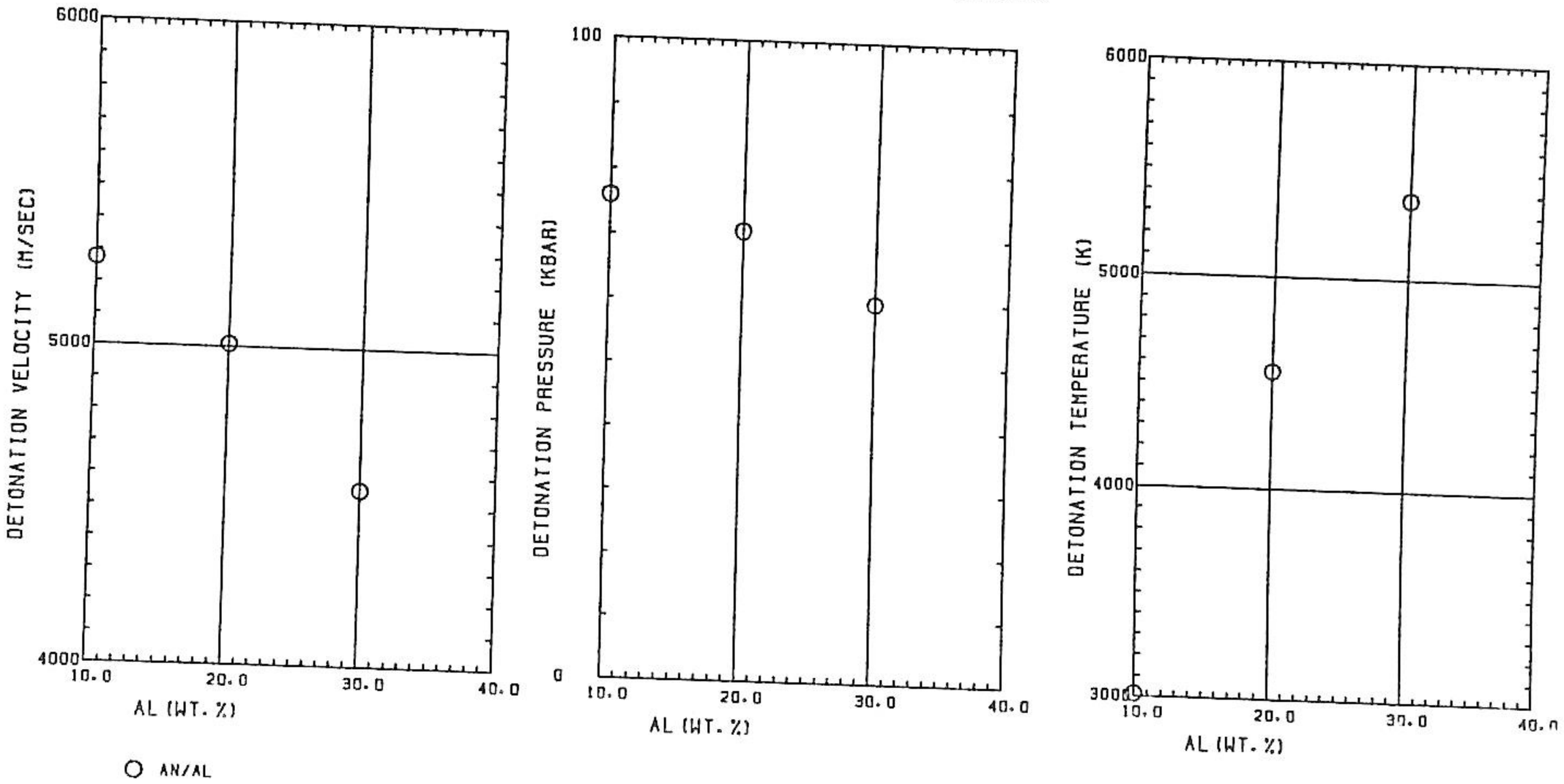
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES	AN 90 AL 10	#AN 80 AL 20	#AN 70 AL 30	#
RHO (G/CC)	1.050	1.050	1.050	
EO (KCAL/MOLE)	-98.14	-87.23	-76.33	
MOL.WEIGHT (G)	100.000	100.000	100.000	
N	2.2488	1.9989	1.7490	
H	4.4976	3.9978	3.4981	
O	3.3732	2.9984	2.6236	
AL	0.3706	0.7412	1.1119	
DETN.VEL (M/SEC)	5273.6	5007.5	4555.6	
PARTICL.VEL(")	1370.6	1345.2	1250.5	
C-J PRESS (KBAR)	75.9	70.7	59.8	
C-J VOLUME (CC/G)	0.70486	0.69654	0.69095	
C-J TEMP (DEG K)	3011.1	4551.7	5367.9	
C-J S(CAL/DEG MOL)	53.15	64.07	72.26	
C-J ENERGY (CAL/G)	224.48	216.25	186.87	
GAMMA	2.848	2.722	2.643	
C-J DETN.HEAT(CAL)	1038.1	1653.5	1993.1	
LAMDA	7.4648	7.1755	6.5194	
VOLUM(K LITTRE/KG)	0.8957	0.7397	0.6271	
TOTAL PRODCT(MOLE)	3.8463	3.3940	3.1191	
V GAS (MOLES)	3.6610	3.0233	2.5631	
V GAS (CC/MOLE)	17.9807	19.9423	21.4519	
V AL2O3(S) (CC/G)	0.24658	0.24774	0.24895	
V AL(S) (CC/G)	0.39405	0.43160	0.45514	
H2O (MOL %)	58.2783	53.6536	29.7940	
N2 (MOL %)	28.2184	28.9569	26.5667	
H2 (MOL %)	0.0093	4.0991	21.4180	
O2 (MOL %)	6.2902	0.0681	0.0041	
NH3 (MOL %)	0.0001	0.3223	2.7584	
OH (MOL %)	0.3559	1.1340	0.6569	
H (MOL %)	0.0003	0.1860	0.7948	
NO (MOL %)	2.0289	0.6599	0.1836	
AL2O3(S) (MOL %)	4.8185	10.9201	17.8236	
AL(S) (MOL %)	0.0	0.0	0.0	

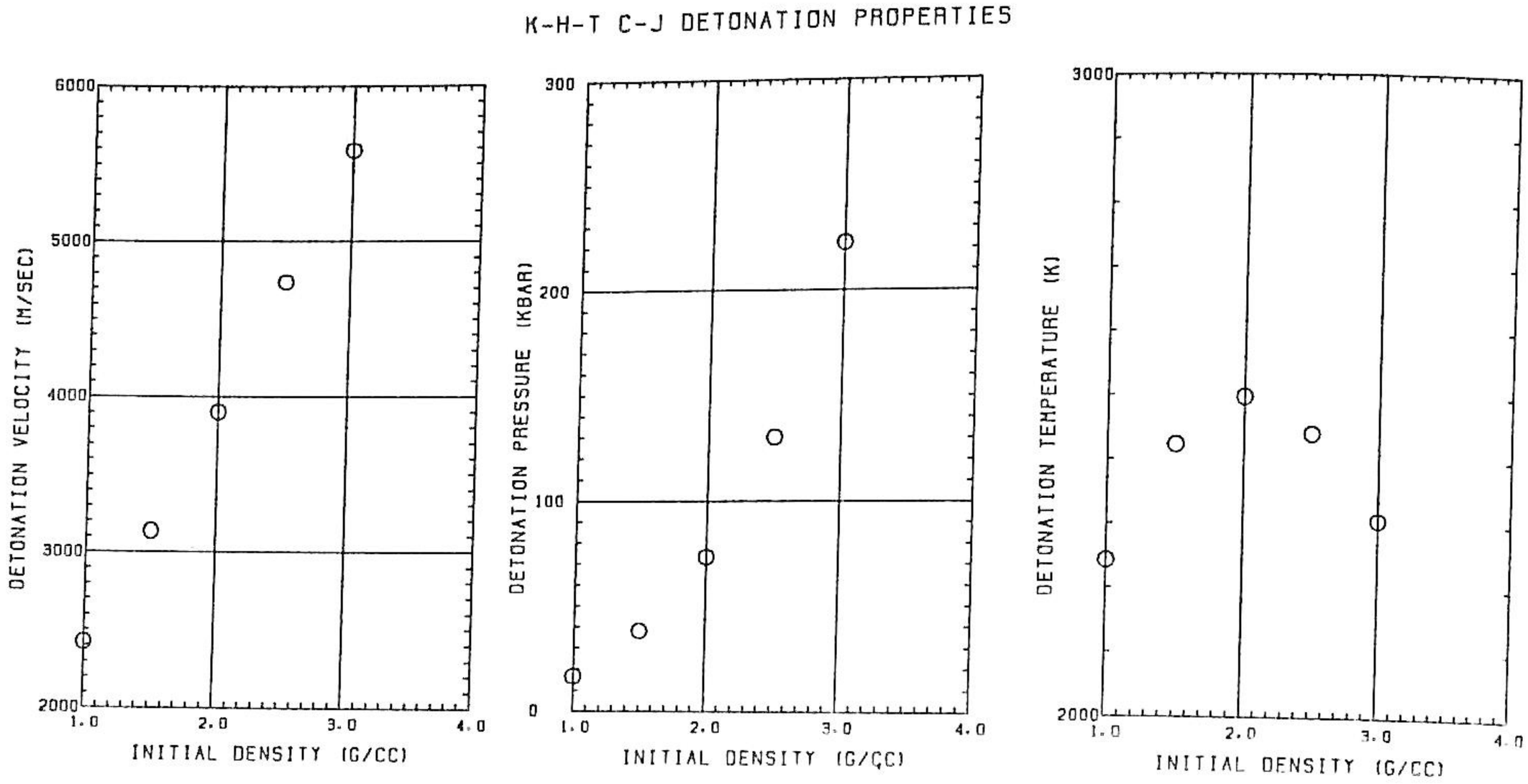
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES	TRICINATE	#TRICINATE	#TRICINATE	#TRICINATE	#TRICINATE	#
RHO (G/CC)	3.000	2.500	2.000	1.500	1.000	
EO (KCAL/MOLE)	-219.30	-219.30	-219.30	-219.30	-219.30	
MOL.WEIGHT (G)	468.295	468.295	468.295	468.295	468.295	
C	6.0000	6.0000	6.0000	6.0000	6.0000	
H	3.0000	3.0000	3.0000	3.0000	3.0000	
N	3.0000	3.0000	3.0000	3.0000	3.0000	
O	9.0000	9.0000	9.0000	9.0000	9.0000	
PB	1.0000	1.0000	1.0000	1.0000	1.0000	
DETN.VEL (M/SEC)	5584.0	4736.3	3902.4	3134.9	2419.8	
PARTICL.VEL(")	1328.0	1099.6	939.2	811.0	683.3	
C-J PRESS (KBAR)	222.5	130.2	73.3	38.1	16.5	
C-J VOLUME (CC/G)	0.25406	0.30714	0.37966	0.49420	0.71766	
C-J TEMP (DEG K)	2305.7	2440.5	2497.0	2422.8	2242.0	
C-J S(CAL/DEG MOL)	62.52	64.18	63.92	60.97	56.92	
C-J ENERGY (CAL/G)	210.76	144.48	105.41	78.60	55.79	
GAMMA	3.205	3.307	3.155	2.865	2.542	
C-J DETN.HEAT(CAL)	479.3	474.0	449.6	396.6	324.6	
LAMDA	11.0912	11.0401	10.8158	10.3914	9.9476	
VOLUM(K LITTRE/KG)	0.3268	0.3300	0.3447	0.3772	0.4221	
TOTAL PRODCT(MOLE)	9.9998	9.9986	9.9948	9.9814	9.9284	
V GAS (MOLES)	6.2557	6.3167	6.5983	7.2195	8.0797	
V GAS (CC/MOLE)	14.6622	17.8164	21.9628	27.6690	38.0122	
V SOL C(S) (CC/G)	0.28633	0.33330	0.36948	0.39653	0.44444	
V SOL PBO((CC/G)	0.07982	0.09209	0.09966	0.10434	0.10941	
H2O (MOL %)	14.9945	14.9406	14.6365	13.6194	11.1790	
CO2 (MOL %)	32.4464	31.8836	29.3529	24.1132	17.8021	
CO (MOL %)	0.1130	1.3017	6.6982	18.3021	33.7933	
N2 (MOL %)	14.9987	14.9947	14.9846	14.9788	15.0355	
H2 (MOL %)	0.0022	0.0401	0.2946	1.1718	3.1349	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.0023	0.0139	0.0460	0.0980	0.1451	
OH (MOL %)	0.0002	0.0006	0.0009	0.0007	0.0002	
H (MOL %)	0.0000	0.0000	0.0002	0.0005	0.0006	
CH4 (MOL %)	0.0000	0.0001	0.0036	0.0446	0.2880	
NO (MOL %)	0.0009	0.0007	0.0004	0.0002	0.0000	
C(S) (MOL %)	27.4417	26.8227	23.9768	17.6522	8.5491	
PBO(S) (MOL %)	10.0002	10.0013	10.0052	10.0186	10.0721	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

TRICINATE RHO = 3.0000 G/CC EO = -2.193000E+05 CAL/MOLE

LN P = -5.32767582 E+00 -2.18895817 E+00LN V 3.49523544 E-01LN V*2 -4.52551767 E-02LN V*3 1.84126268 E-03LN V*4

LN T = 7.24738026 E+00 -2.46079803 E-01LN V 9.55500603 E-02LN V*2 -2.39378177 E-02LN V*3 1.92103838 E-03LN V*4

LN E = -1.90800381 E+00 2.50920892 E-01LNP 4.66564596 E-02LN P*2 3.89196677 E-03LN P*3 1.17060175 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (601.820)	0.1900	3537.8 (3114.1)	-763.5	0.13195 (0.12735)	3.7578	0.0
400.000 (427.846)	0.2084	3027.0 (2899.7)	-550.6	0.12304 (0.12225)	3.6477	427.5
300.000 (296.266)	0.2309	2598.8 (2691.2)	-355.6	0.11488 (0.11660)	3.5287	903.9
* 222.474 (212.432)	0.2540	2305.7 (2520.8)	-210.9	0.10882 (0.11165)	3.4207	1328.0
200.000 (188.547)	0.2631	2280.9 (2463.5)	-181.9	0.10761 (0.11009)	3.3819	1475.2
100.000 (91.651)	0.3282	2104.5 (2156.4)	-30.4	0.10127 (0.10202)	3.1464	2261.0
80.000 (73.641)	0.3521	2045.6 (2075.2)	7.1	0.09970 (0.10005)	3.0749	2468.3
60.000 (55.872)	0.3857	1968.4 (1979.8)	49.2	0.09794 (0.09788)	2.9844	2712.2
50.000 (47.006)	0.4090	1919.8 (1924.0)	72.7	0.09696 (0.09670)	2.9278	2855.6
40.000 (38.105)	0.4397	1860.8 (1859.8)	98.7	0.09587 (0.09542)	2.8590	3021.0
30.000 (28.299)	0.4888	1789.3 (1775.3)	127.1	0.09468 (0.09402)	2.7615	3240.0
20.000 (19.589)	0.5602	1692.1 (1680.7)	161.6	0.09324 (0.09244)	2.6411	3488.5
10.000 (10.316)	0.7214	1548.3 (1538.8)	206.9	0.09134 (0.09058)	2.4320	3871.3
8.000 (8.358)	0.7876	1508.1 (1498.0)	218.7	0.09085 (0.09015)	2.3637	3985.1
6.000 (6.346)	0.8869	1460.0 (1448.6)	232.5	0.09027 (0.08968)	2.2748	4126.1
5.000 (5.319)	0.9595	1431.5 (1419.0)	240.5	0.08994 (0.08943)	2.2181	4212.4
4.000 (4.270)	1.0610	1398.5 (1384.6)	249.7	0.08955 (0.08915)	2.1480	4315.5
3.000 (3.202)	1.2167	1358.6 (1342.9)	260.7	0.08909 (0.08885)	2.0570	4444.1
2.000 (2.116)	1.4981	1306.9 (1289.5)	274.8	0.08850 (0.08848)	1.9281	4618.1
1.000 (1.028)	2.2293	1228.0 (1211.9)	296.2	0.08761 (0.08792)	1.7120	4895.7
0.800 (0.814)	2.5621	1204.8 (1190.4)	302.5	0.08734 (0.08774)	1.6453	4980.0
0.600 (0.603)	3.0898	1175.9 (1164.6)	310.4	0.08701 (0.08749)	1.5626	5085.2
0.500 (0.499)	3.4956	1158.1 (1149.2)	315.2	0.08681 (0.08733)	1.5123	5150.1
0.400 (0.395)	4.0866	1136.7 (1131.3)	321.0	0.08657 (0.08712)	1.4534	5228.0
0.300 (0.294)	5.0409	1109.7 (1109.0)	328.3	0.08626 (0.08682)	1.3823	5326.2
0.200 (0.194)	6.8833	1072.1 (1078.2)	338.4	0.08584 (0.08636)	1.2928	5461.0
0.100 (0.096)	12.1529	1008.6 (1023.1)	355.3	0.08513 (0.08546)	1.1752	5683.3
0.080 (0.077)	14.6984	988.4 (1004.0)	360.6	0.08491 (0.08515)	1.1479	5752.8
0.060 (0.058)	18.8438	962.5 (977.9)	367.3	0.08463 (0.08474)	1.1205	5841.2
0.050 (0.049)	22.0855	946.2 (960.7)	371.5	0.08446 (0.08448)	1.1076	5896.5
0.040 (0.039)	26.8531	926.4 (938.8)	376.5	0.08425 (0.08415)	1.0963	5963.5
0.030 (0.030)	34.5872	901.1 (909.6)	382.7	0.08399 (0.08375)	1.0889	6049.0
0.020 (0.020)	49.4651	865.6 (867.2)	391.3	0.08363 (0.08321)	1.0908	6168.0
0.010 (0.010)	91.1930	805.5 (795.9)	405.1	0.08305 (0.08248)	1.1223	6368.3
0.008 (0.008)	111.0073	786.2 (774.6)	409.2	0.08288 (0.08232)	1.1387	6432.0
0.006 (0.006)	142.9425	761.5 (749.1)	414.5	0.08266 (0.08220)	1.1633	6513.3
0.005 (0.005)	167.7424	745.8 (734.5)	417.7	0.08252 (0.08218)	1.1806	6564.3
0.004 (0.004)	203.9447	726.7 (718.6)	421.5	0.08236 (0.08222)	1.2033	6626.2
0.003 (0.003)	262.2021	702.1 (701.8)	426.3	0.08216 (0.08239)	1.2345	6704.9
0.002 (0.002)	373.1272	667.6 (686.9)	432.7	0.08189 (0.08291)	1.2809	6813.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

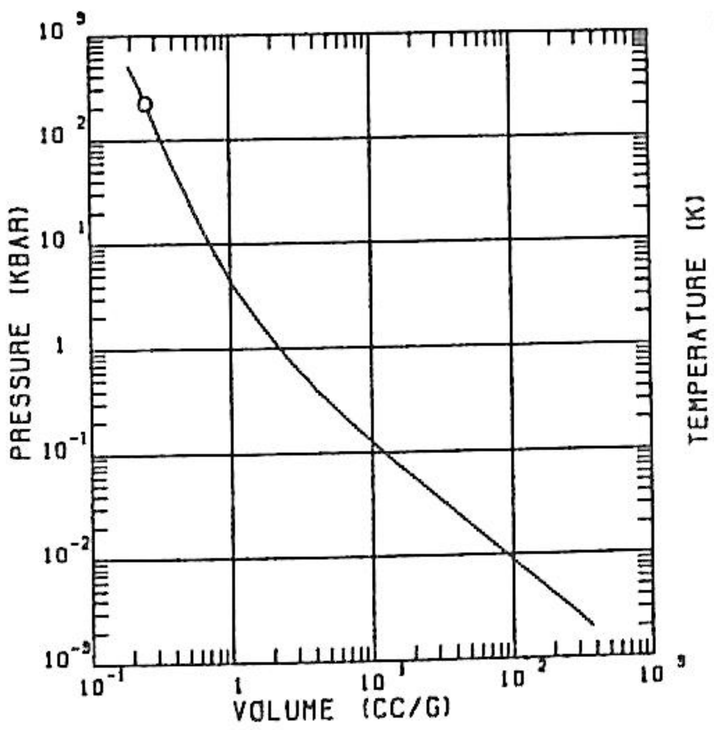
TRICINATE RHO = 3.0000 G/CC EO = -2.193000E+05 CAL/MOLE

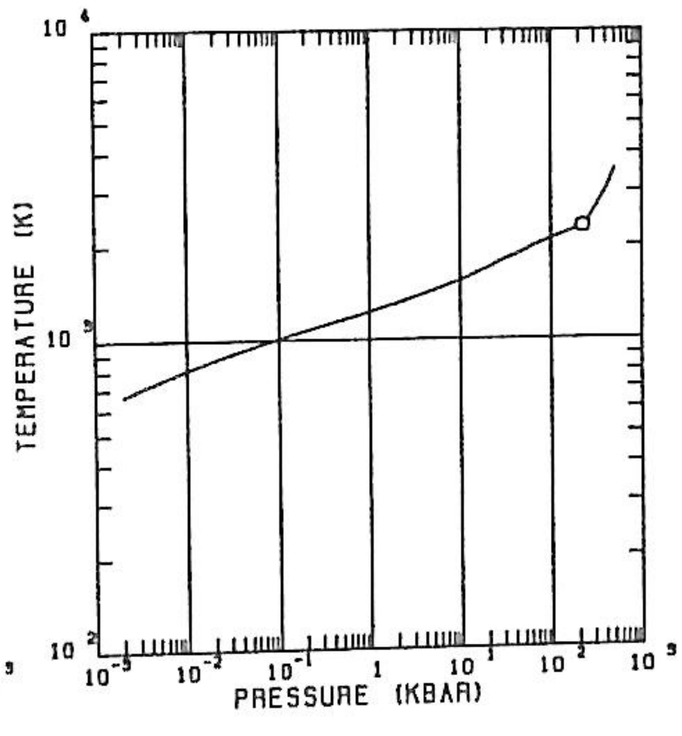
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

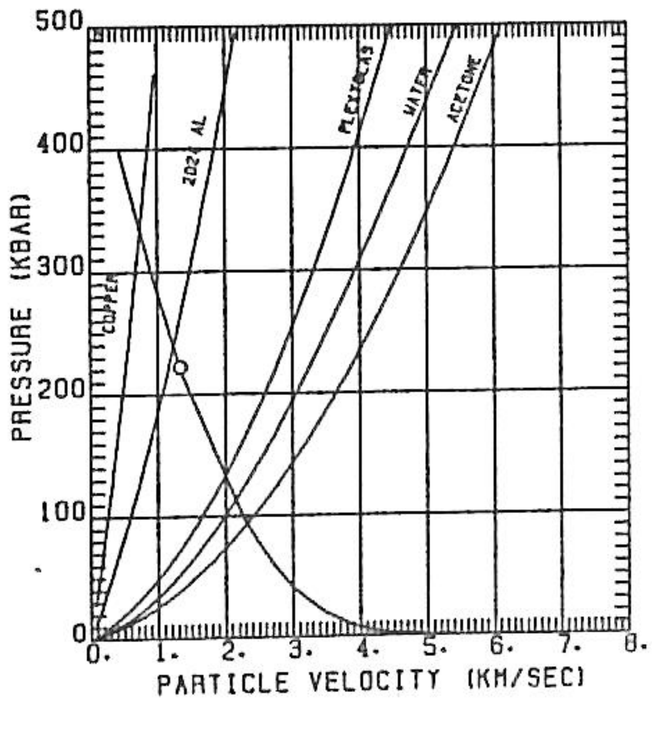
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	PBO(S)
222.474	1.49942	3.24460	0.01127	1.49984	0.00022	0.00000	0.00023	0.00002	0.00000	0.00000	0.00009	2.74414	1.00000
200.000	1.49919	3.24242	0.01590	1.49982	0.00035	0.00000	0.00030	0.00002	0.00000	0.00000	0.00006	2.74169	1.00000
100.000	1.49462	3.20665	0.09208	1.49940	0.00356	0.00000	0.00120	0.00001	0.00000	0.00001	0.00001	2.70127	1.00000
80.000	1.49112	3.18481	0.13926	1.49916	0.00629	0.00000	0.00167	0.00001	0.00000	0.00004	0.00000	2.67589	1.00000
60.000	1.48437	3.15005	0.21554	1.49880	0.01173	0.00000	0.00241	0.00000	0.00000	0.00015	0.00000	2.63427	1.00000
50.000	1.47849	3.12515	0.27121	1.49853	0.01650	0.00000	0.00293	0.00000	0.00000	0.00030	0.00000	2.60334	1.00000
40.000	1.46939	3.09345	0.34372	1.49819	0.02383	0.00000	0.00361	0.00000	0.00000	0.00068	0.00000	2.56215	1.00000
30.000	1.45431	3.05296	0.43978	1.49776	0.03565	0.00000	0.00448	0.00000	0.00000	0.00166	0.00000	2.50560	1.00000
20.000	1.42494	3.00269	0.56969	1.49715	0.05648	0.00000	0.00571	0.00000	0.00000	0.00501	0.00000	2.42261	1.00000
10.000	1.35341	2.95539	0.73584	1.49645	0.09665	0.00000	0.00709	0.00000	0.00000	0.01965	0.00000	2.28913	1.00000
8.000	1.32567	2.95140	0.77156	1.49636	0.10911	0.00000	0.00728	0.00000	0.00000	0.02715	0.00000	2.24989	1.00000
6.000	1.28828	2.95373	0.80431	1.49634	0.12388	0.00000	0.00732	0.00000	0.00000	0.03843	0.00000	2.20355	1.00000
5.000	1.26457	2.95904	0.81740	1.49638	0.13226	0.00000	0.00725	0.00000	0.00000	0.04615	0.00000	2.17744	1.00000
4.000	1.23606	2.96852	0.82695	1.49646	0.14156	0.00000	0.00708	0.00000	0.00000	0.05588	0.00000	2.14866	1.00000
3.000	1.20165	2.98498	0.82845	1.49663	0.15182	0.00000	0.00675	0.00000	0.00000	0.06820	0.00000	2.11841	1.00000
2.000	1.15925	3.01370	0.81342	1.49693	0.16338	0.00000	0.00615	0.00000	0.00000	0.08407	0.00000	2.08885	1.00000
1.000	1.10552	3.07058	0.75339	1.49748	0.17690	0.00000	0.00505	0.00000	0.00000	0.10501	0.00000	2.07106	1.00000
0.800	1.09296	3.08958	0.72794	1.49765	0.18001	0.00000	0.00471	0.00000	0.00000	0.10999	0.00000	2.07253	1.00000
0.600	1.07996	3.11430	0.69151	1.49786	0.18324	0.00000	0.00428	0.00000	0.00000	0.11519	0.00000	2.07903	1.00000
0.500	1.07359	3.13015	0.66618	1.49799	0.18481	0.00000	0.00403	0.00000	0.00000	0.11778	0.00000	2.08589	1.00000
0.400	1.06757	3.14926	0.63399	1.49814	0.18638	0.00000	0.00373	0.00000	0.00000	0.12024	0.00000	2.09653	1.00000
0.300	1.06268	3.17370	0.59000	1.49833	0.18773	0.00000	0.00336	0.00000	0.00000	0.12228	0.00000	2.11403	1.00000
0.200	1.06098	3.20751	0.52408	1.49857	0.18829	0.00000	0.00288	0.00000	0.00000	0.12321	0.00000	2.14520	1.00000
0.100	1.06989	3.26199	0.40622	1.49893	0.18534	0.00000	0.00217	0.00000	0.00000	0.12076	0.00000	2.21103	1.00000
0.080	1.07513	3.27797	0.36902	1.49903	0.18338	0.00000	0.00197	0.00000	0.00000	0.11927	0.00000	2.23374	1.00000
0.060	1.08322	3.29724	0.32241	1.49914	0.18005	0.00000	0.00173	0.00000	0.00000	0.11707	0.00000	2.26329	1.00000
0.050	1.08911	3.30866	0.29367	1.49921	0.17736	0.00000	0.00160	0.00000	0.00000	0.11557	0.00000	2.28209	1.00000
0.040	1.09688	3.32148	0.26027	1.49929	0.17365	0.00000	0.00144	0.00000	0.00000	0.11366	0.00000	2.30460	1.00000
0.030	1.10787	3.33622	0.21980	1.49938	0.16800	0.00000	0.00126	0.00000	0.00000	0.11112	0.00000	2.33288	1.00000
0.020	1.12521	3.35327	0.16836	1.49949	0.15829	0.00000	0.00104	0.00000	0.00000	0.10747	0.00000	2.37088	1.00000
0.010	1.15969	3.37151	0.09742	1.49964	0.13705	0.00000	0.00074	0.00000	0.00000	0.10108	0.00000	2.42999	1.00000
0.008	1.17195	3.37435	0.07949	1.49968	0.12916	0.00000	0.00066	0.00000	0.00000	0.09895	0.00000	2.44721	1.00000
0.006	1.18868	3.37588	0.05970	1.49973	0.11827	0.00000	0.00057	0.00000	0.00000	0.09611	0.00000	2.46831	1.00000
0.005	1.19974	3.37567	0.04906	1.49976	0.11105	0.00000	0.00052	0.00000	0.00000	0.09423	0.00000	2.48104	1.00000
0.004	1.21372	3.37423	0.03797	1.49979	0.10198	0.00000	0.00046	0.00000	0.00000	0.09182	0.00000	2.49598	1.00000
0.003	1.23230	3.37067	0.02652	1.49982	0.09009	0.00000	0.00039	0.00000	0.00000	0.08853	0.00000	2.51429	1.00000
0.002	1.25930	3.36290	0.01508	1.49987	0.07342	0.00000	0.00030	0.00000	0.00000	0.08343	0.00000	2.53860	1.00000
300.000	1.49953	3.24516	0.00947	1.49961	0.00014	0.00001	0.00020	0.00008	0.00000	0.00000	0.00057	2.74538	1.00000
400.000	1.49934	3.24258	0.01084	1.49793	0.00013	0.00020	0.00024	0.00036	0.00000	0.00000	0.00391	2.74659	1.00000
500.000	1.49856	3.23173	0.01711	1.49135	0.00018	0.00130	0.00039	0.00136	0.00000	0.00000	0.01690	2.75116	1.00000

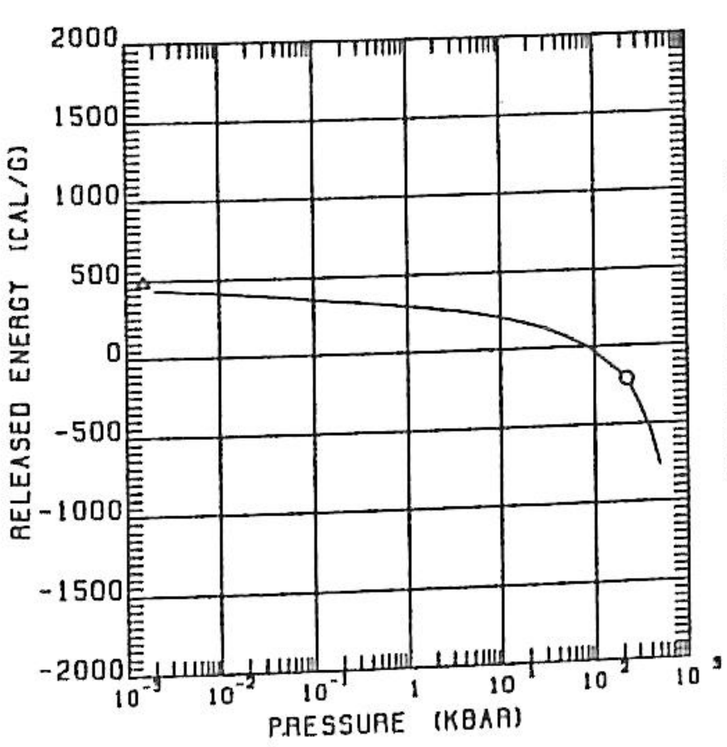
PRESS ;KBAR, PRODUCTS ;MOLES

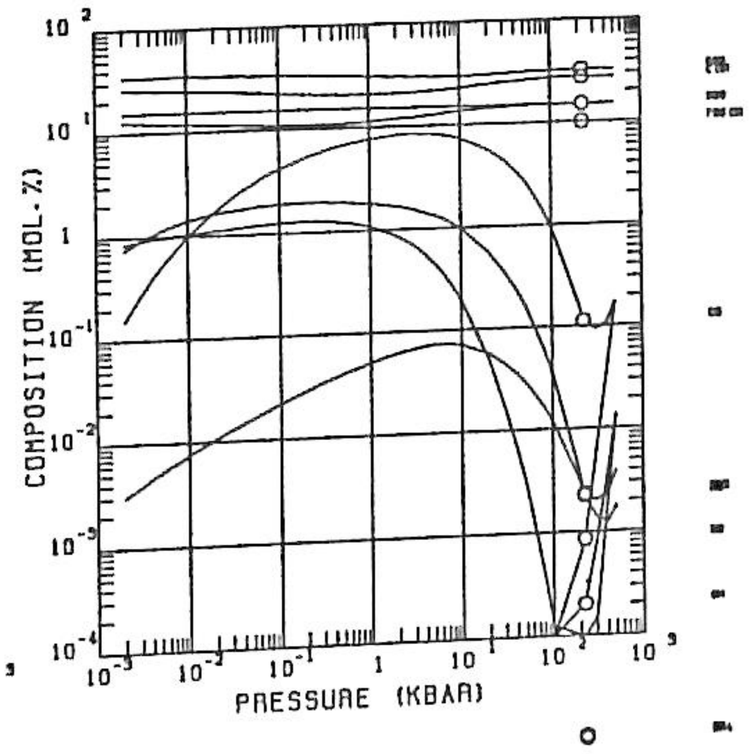
K-H-T ISENTROPE THRU C-J POINT











TRICINATE

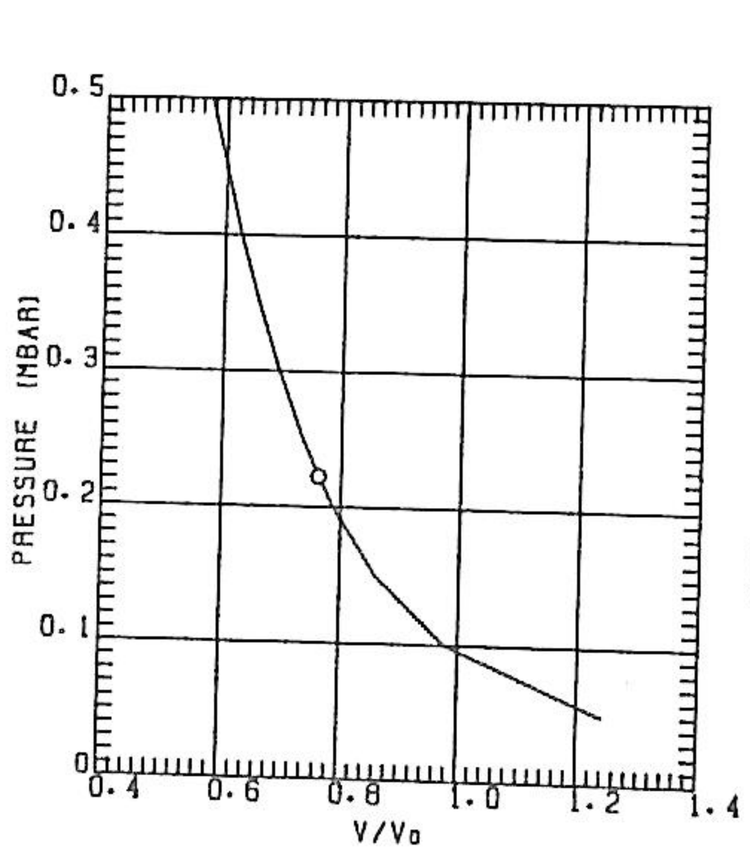
RHO (G/CC)	3.000
E_0 (KCAL/MOLE)	-219.30
D_{C-J} (M/SEC)	5584.
P_{C-J} (KBAR)	222.5
T_{C-J} (K)	2306.

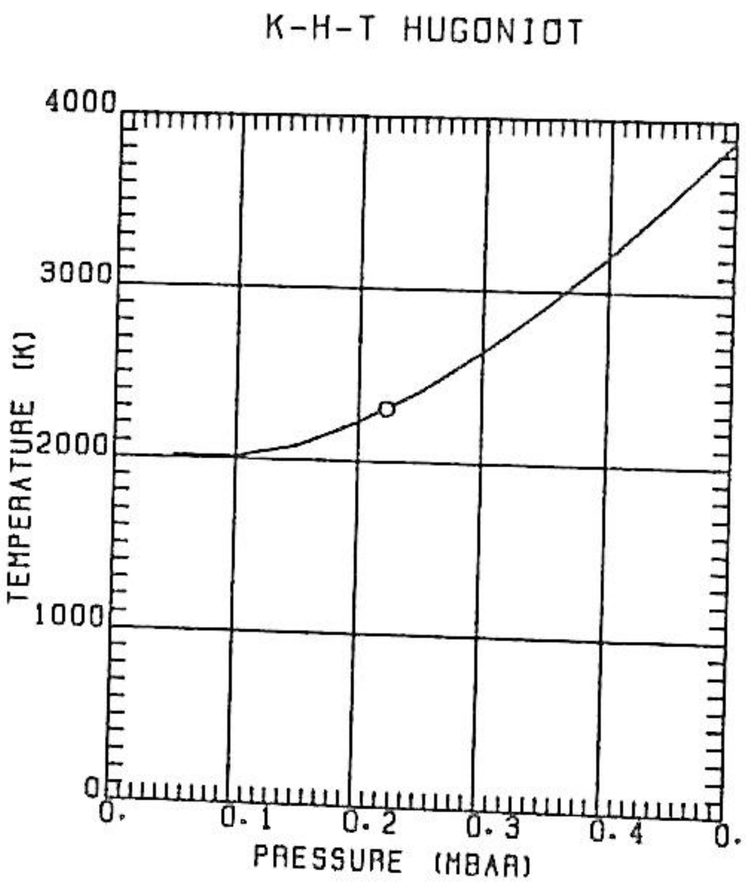
DATE 82-10-28

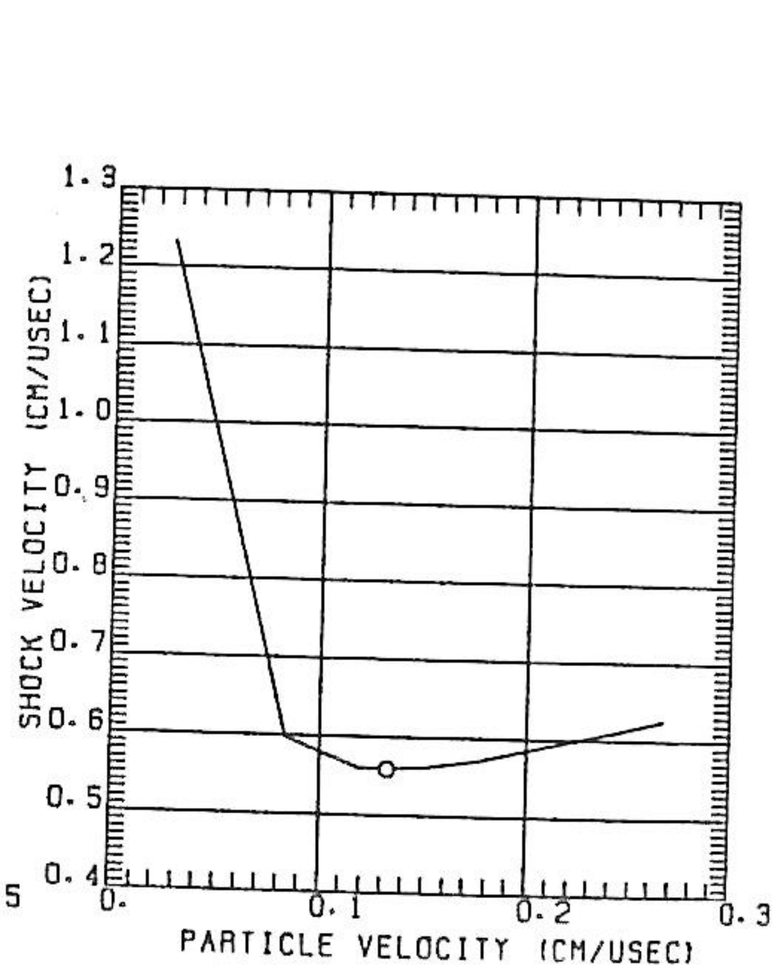
********** A K-H-T H U G O N I O T <<DATE 82-10-28>>**********

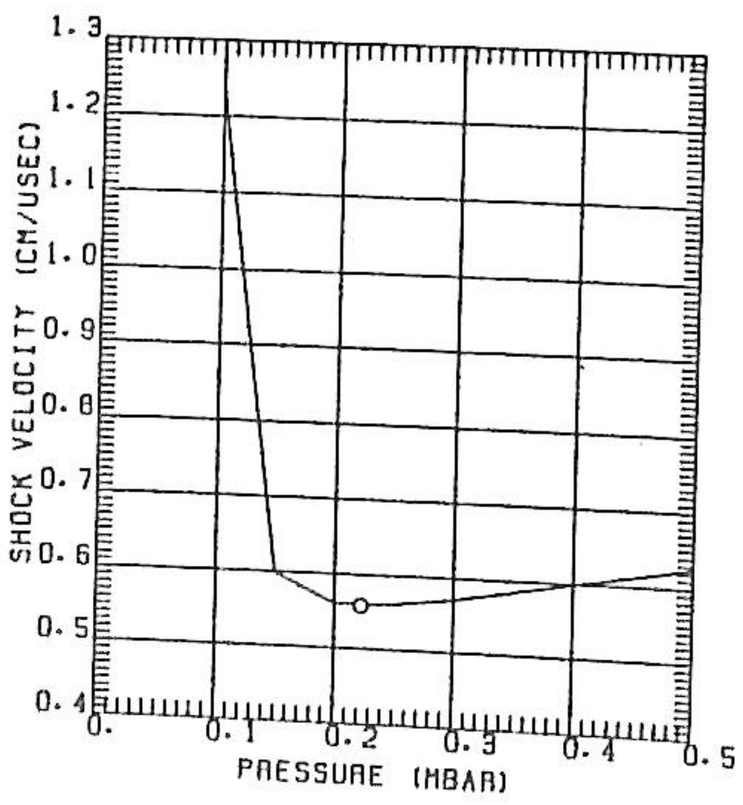
TRICINATE RHO = 3.0000 G/CC, EO = -2.193000E+05 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.1915	0.2000	0.2093	0.2195	0.2312	0.2450	0.2625	0.2868	0.3260	0.4136
TEMP (DEG K)	3878.7	3532.0	3207.9	2911.4	2645.3	2415.0	2225.6	2086.1	2011.7	2013.8
US (M/SEC)	6257.6	6124.5	5985.5	5845.3	5712.1	5608.3	5600.6	5982.2	12332.5	0.0
UP (M/SEC)	2663.4	2449.2	2227.6	1995.9	1750.7	1485.9	1190.3	835.8	270.3	0.0
H2O (MOLE)	1.4969	1.4982	1.4989	1.4993	1.4994	1.4995	1.4993	1.4988	1.4960	1.4715
CO2 (MOLE)	3.2141	3.2289	3.2376	3.2421	3.2442	3.2449	3.2440	3.2398	3.2202	3.0738
CO (MOLE)	0.0366	0.0258	0.0184	0.0138	0.0112	0.0106	0.0126	0.0217	0.0636	0.3809
N2 (MOLE)	1.4847	1.4925	1.4968	1.4988	1.4995	1.4998	1.4998	1.4998	1.4995	1.4982
H2 (MOLE)	0.0004	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	0.0006	0.0025	0.0223
O2 (MOLE)	0.0027	0.0011	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0007	0.0005	0.0004	0.0003	0.0002	0.0002	0.0003	0.0004	0.0009	0.0036
OH (MOLE)	0.0031	0.0015	0.0007	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004
NO (MOLE)	0.0299	0.0145	0.0061	0.0022	0.0007	0.0002	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	2.7494	2.7453	2.7440	2.7441	2.7445	2.7446	2.7434	2.7386	2.7162	2.5449
PBO(S) (MOLE)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000









TRICINATE
RHO (G/CC) 3.000
E_0 (KCAL/MOLE) -219.30

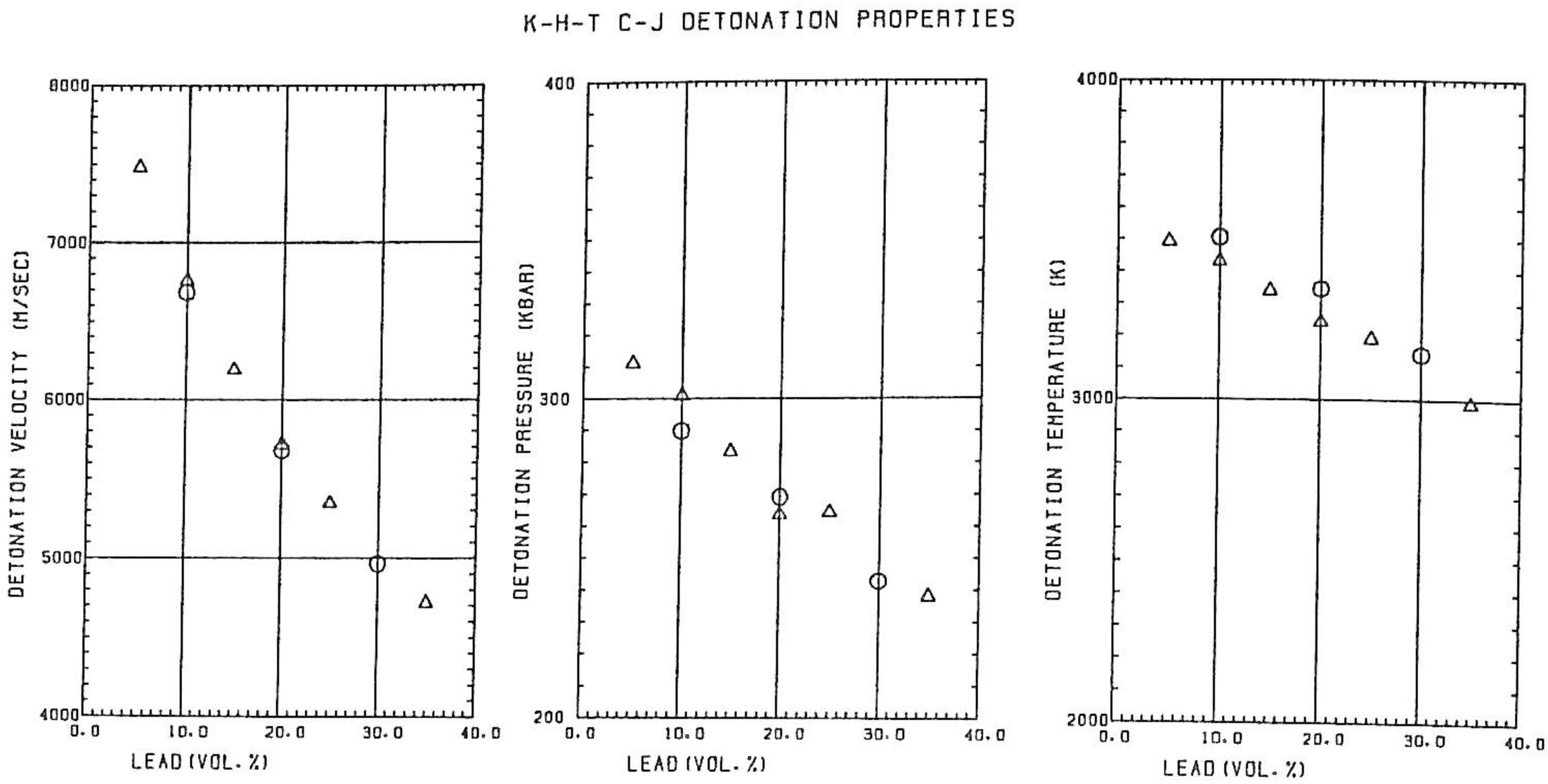
DATE 82-10-28

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	RDX/EXON/PB 80/10/10 VOL	#RDX/EXON/PB 70/10/20	#RDX/EXON/PB 60/10/30	#RDX/PB/KEL-F 55/35/10	#RDX/PB/KEL-F 65/25/10	#RDX/PB/KEL-F 70/20/10	#RDX/PB/KEL-F 75/15/10
RHO (G/CC)	2.700	3.650	4.600	5.107	4.164	3.680	3.218
EO (KCAL/MOLE)	5.78	4.41	3.04	-7.84	-6.47	-5.79	-5.10
MOL.WEIGHT (G)	274.500	370.000	465.500	514.750	419.250	371.500	323.750
C	2.2902	2.0470	1.8039	1.7471	1.9902	2.1118	2.2333
H	4.0624	3.5762	3.0900	2.8792	3.3655	3.6086	3.8517
N	3.8898	3.4036	2.9174	2.6743	3.1605	3.4036	3.6467
O	3.8898	3.4036	2.9174	2.6743	3.1605	3.4036	3.6467
F	0.3452	0.3452	0.3452	0.5124	0.5124	0.5124	0.5124
CL	0.1726	0.1726	0.1726	0.1025	0.1025	0.1025	0.1025
PB	0.5478	1.0956	1.6434	1.9173	1.3695	1.0956	0.8217
DETN.VEL (M/SEC)	6681.0	5676.3	4965.6	4716.0	5344.3	5715.2	6187.5
PARTICL.VEL(")	1606.4	1298.7	1062.8	988.1	1187.1	1253.5	1422.9
C-J PRESS (KBAR)	289.8	269.1	242.8	238.0	264.2	263.6	283.3
C-J VOLUME (CC/G)	0.28131	0.21129	0.17086	0.15478	0.18681	0.21214	0.23929
C-J TEMP (DEG K)	3505.2	3344.7	3141.9	2986.8	3189.6	3241.8	3339.3
C-J S(CAL/DEG MOL)	57.54	61.54	66.55	68.82	63.27	60.87	58.86
C-J ENERGY (CAL/G)	308.40	201.54	134.99	116.68	168.41	187.76	241.95
GAMMA	3.159	3.371	3.672	3.773	3.502	3.559	3.349
C-J DETN.HEAT(CAL)	845.4	556.0	385.1	320.5	456.8	551.1	673.4
LAMDA	9.0262	9.0145	8.9985	8.7756	8.8239	8.8425	8.8603
VOLUM(K LITTRE/KG)	0.4751	0.3118	0.2156	0.1840	0.2617	0.3157	0.3852
TOTAL PRODCT(MOLE)	7.0743	6.8916	6.7094	6.7483	6.9302	7.0210	7.1125
V GAS (MOLES)	5.3304	4.7163	4.1023	3.8722	4.4851	4.7934	5.0980
V GAS (CC/MOLE)	12.3718	12.6115	12.9537	12.7423	12.4333	12.4898	12.2366
V SOL C(S) (CC/G)	0.26191	0.27014	0.28085	0.28232	0.27160	0.27211	0.26398
V SOL PB(S (CC/G)	0.06619	0.06694	0.06798	0.06817	0.06713	0.06715	0.06642
H2O (MOL %)	24.9159	22.0781	19.0815	16.7225	19.7719	21.2309	22.6622
CO2 (MOL %)	14.4907	13.2073	11.8461	11.2061	12.5948	13.2413	13.9078
CO (MOL %)	0.9746	0.8303	0.6783	0.4764	0.6021	0.7146	0.7221
N2 (MOL %)	27.4318	24.6545	21.7179	19.8004	22.7770	24.2084	25.5963
CF4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2 (MOL %)	0.0599	0.0516	0.0430	0.0276	0.0345	0.0423	0.0414
O2 (MOL %)	0.0024	0.0011	0.0004	0.0002	0.0007	0.0008	0.0014
NH3 (MOL %)	0.0408	0.0330	0.0254	0.0153	0.0210	0.0255	0.0270
OH (MOL %)	0.0278	0.0168	0.0084	0.0047	0.0101	0.0125	0.0170
H (MOL %)	0.0006	0.0004	0.0002	0.0001	0.0002	0.0003	0.0003
CH4 (MOL %)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO (MOL %)	0.0809	0.0457	0.0208	0.0124	0.0292	0.0351	0.0524
HCL (MOL %)	2.4412	2.5059	2.5740	1.5201	1.4802	1.4611	1.4423
CCL4 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF (MOL %)	4.8814	5.0109	5.1470	7.5949	7.3955	7.2999	7.2060
F2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOL %)	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
C(S) (MOL %)	16.9083	15.6665	14.3628	14.2074	15.5213	16.1224	16.7707
PB(S) (MOL %)	7.7436	15.8978	24.4943	28.4119	19.7614	15.6048	11.5531

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-01>> **********

EXPLOSIVES	RDX/PB/KEL-F 80/10/10	#RDX/PB/KEL-F 95/5/10
RHO (G/CC)	2.748	2.274
EO (KCAL/MOLE)	-4.42	-3.73
MOL.WEIGHT (G)	276.000	228.250
C	2.3549	2.4764
H	4.0948	4.3379
N	3.8898	4.1329
O	3.8898	4.1329
F	0.5124	0.5124
CL	0.1025	0.1025
PB	0.5478	0.2739
DETN.VEL (M/SEC)	6756.9	7479.4
PARTICL.VEL(")	1620.7	1829.2
C-J PRESS (KBAR)	300.9	311.1
C-J VOLUME (CC/G)	0.27661	0.33220
C-J TEMP (DEG K)	3429.2	3492.0
C-J S(CAL/DEG MOL)	57.05	55.37
C-J ENERGY (CAL/G)	313.91	399.87
GAMMA	3.169	3.089
C-J DETN.HEAT(CAL)	837.9	1071.1
LAMDA	8.8757	8.8891
VOLUM(K LITTRE/KG)	0.4789	0.6119
TOTAL PRODCT(MOLE)	7.2042	7.2957
V GAS (MOLES)	5.4029	5.7088
V GAS (CC/MOLE)	12.0325	11.9330
V SOL C(S) (CC/G)	0.25687	0.25286
V SOL PB(S (CC/G)	0.06580	0.06546
H2O (MOL %)	24.0546	25.4091
CO2 (MOL %)	14.5499	15.1660
CO (MOL %)	0.7391	0.7821
N2 (MOL %)	26.9457	28.2624
CF4 (MOL %)	0.0000	0.0000
H2 (MOL %)	0.0414	0.0436
O2 (MOL %)	0.0022	0.0030
NH3 (MOL %)	0.0288	0.0315
OH (MOL %)	0.0223	0.0271
H (MOL %)	0.0004	0.0005
CH4 (MOL %)	0.0000	0.0000
NO (MOL %)	0.0740	0.0930
HCL (MOL %)	1.4239	1.4061
CCL4 (MOL %)	0.0000	0.0000
HF (MOL %)	7.1143	7.0251
F2 (MOL %)	0.0000	0.0000
CL2 (MOL %)	0.0000	0.0000
C(S) (MOL %)	17.3993	17.9963
PB(S) (MOL %)	7.6040	3.7543



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

RDX/EXON/PB 80/10/10 VOL RHO = 2.7000 G/CC EO = 5.778934E+03 CAL/MOLE

LN P = -4.63708210 E+00 -2.20672131 E+00LN V 3.22252989 E-01LN V*2 -3.97281498 E-02LN V*3 1.59861008 E-03LN V*4

LN T = 7.51423645 E+00 -3.60970676 E-01LN V 1.12436831 E-01LN V*2 -2.11180337 E-02LN V*3 1.32499752 E-03LN V*4

LN E = -1.85467815 E+00 3.07838500 E-01LNP 5.20276241 E-02LN P*2 4.13531810 E-03LN P*3 1.20660625 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (634.524)	0.2228	4578.0 (4393.4)	-930.4	0.13893 (0.13548)	3.4647	259.3
500.000 (514.913)	0.2368	4218.6 (4173.1)	-728.6	0.13048 (0.12946)	3.4016	639.0
400.000 (405.418)	0.2542	3885.2 (3937.8)	-531.7	0.12225 (0.12293)	3.3294	1060.0
300.000 (301.298)	0.2783	3542.4 (3669.1)	-329.8	0.11380 (0.11569)	3.2395	1550.7
* 289.781 (290.833)	0.2813	3505.2 (3638.7)	-308.2	0.11290 (0.11490)	3.2288	1606.4
200.000 (195.723)	0.3188	3297.0 (3319.8)	-148.2	0.10620 (0.10734)	3.1089	2201.4
100.000 (96.012)	0.4042	2879.4 (2835.7)	82.1	0.09656 (0.09683)	2.8930	3114.4
80.000 (76.740)	0.4372	2749.5 (2703.9)	139.7	0.09416 (0.09423)	2.8252	3366.1
60.000 (57.680)	0.4844	2585.6 (2548.7)	205.5	0.09140 (0.09131)	2.7389	3665.7
50.000 (48.217)	0.5175	2486.8 (2457.9)	242.3	0.08986 (0.08969)	2.6848	3842.5
40.000 (38.773)	0.5619	2372.2 (2354.1)	282.9	0.08817 (0.08791)	2.6191	4046.9
30.000 (28.963)	0.6293	2237.6 (2225.5)	328.3	0.08627 (0.08591)	2.5315	4303.6
20.000 (19.700)	0.7354	2065.6 (2072.4)	382.4	0.08400 (0.08357)	2.4163	4615.9
10.000 (10.158)	0.9788	1827.8 (1848.3)	453.8	0.08101 (0.08058)	2.2206	5092.5
8.000 (8.192)	1.0798	1764.1 (1785.0)	472.7	0.08022 (0.07982)	2.1579	5233.3
6.000 (6.189)	1.2327	1690.2 (1708.7)	494.6	0.07931 (0.07895)	2.0771	5407.9
5.000 (5.174)	1.3452	1647.3 (1663.3)	507.3	0.07877 (0.07846)	2.0259	5514.7
4.000 (4.147)	1.5030	1598.3 (1610.7)	522.0	0.07816 (0.07791)	1.9635	5641.8
3.000 (3.104)	1.7473	1541.5 (1547.3)	539.0	0.07745 (0.07727)	1.8830	5801.1
2.000 (2.058)	2.1881	1468.4 (1466.9)	561.4	0.07651 (0.07646)	1.7721	6014.7
1.000 (1.014)	3.3351	1361.0 (1350.8)	595.3	0.07509 (0.07525)	1.5922	6355.3
0.800 (0.807)	3.8591	1330.1 (1318.5)	605.2	0.07468 (0.07489)	1.5380	6459.3
0.600 (0.602)	4.6920	1291.8 (1279.8)	617.7	0.07416 (0.07443)	1.4716	6589.7
0.500 (0.499)	5.3345	1268.3 (1256.8)	625.4	0.07383 (0.07413)	1.4318	6670.7
0.400 (0.398)	6.2723	1240.3 (1230.1)	634.6	0.07345 (0.07377)	1.3856	6768.2
0.300 (0.296)	7.7879	1205.2 (1197.4)	646.3	0.07296 (0.07330)	1.3307	6891.7
0.200 (0.196)	10.7095	1157.0 (1153.8)	662.4	0.07228 (0.07262)	1.2634	7061.7
0.100 (0.098)	18.9811	1077.5 (1082.2)	688.9	0.07117 (0.07142)	1.1792	7341.8
0.080 (0.078)	22.9416	1052.9 (1059.1)	697.0	0.07084 (0.07103)	1.1607	7429.3
0.060 (0.059)	29.3448	1021.4 (1028.9)	707.3	0.07041 (0.07051)	1.1430	7540.2
0.050 (0.049)	34.3237	1001.6 (1009.5)	713.7	0.07014 (0.07019)	1.1352	7609.4
0.040 (0.040)	41.6106	977.8 (985.3)	721.2	0.06982 (0.06979)	1.1291	7693.1
0.030 (0.030)	53.3583	947.3 (953.5)	730.7	0.06943 (0.06930)	1.1264	7799.5
0.020 (0.020)	75.7602	904.8 (907.8)	743.5	0.06889 (0.06863)	1.1314	7946.8
0.010 (0.010)	137.6390	832.4 (829.3)	763.9	0.06804 (0.06765)	1.1595	8191.3
0.008 (0.008)	166.6908	809.2 (804.5)	769.9	0.06779 (0.06741)	1.1727	8268.1
0.006 (0.006)	213.1108	779.2 (773.6)	777.5	0.06747 (0.06715)	1.1918	8365.5
0.005 (0.005)	248.8527	760.1 (754.7)	782.1	0.06728 (0.06703)	1.2049	8426.3
0.004 (0.004)	300.6406	736.8 (732.6)	787.6	0.06705 (0.06693)	1.2217	8499.5
0.003 (0.003)	383.2297	706.6 (705.9)	794.3	0.06677 (0.06691)	1.2443	8592.0
0.002 (0.002)	538.3337	664.4 (672.5)	803.3	0.06639 (0.06709)	1.2767	8718.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

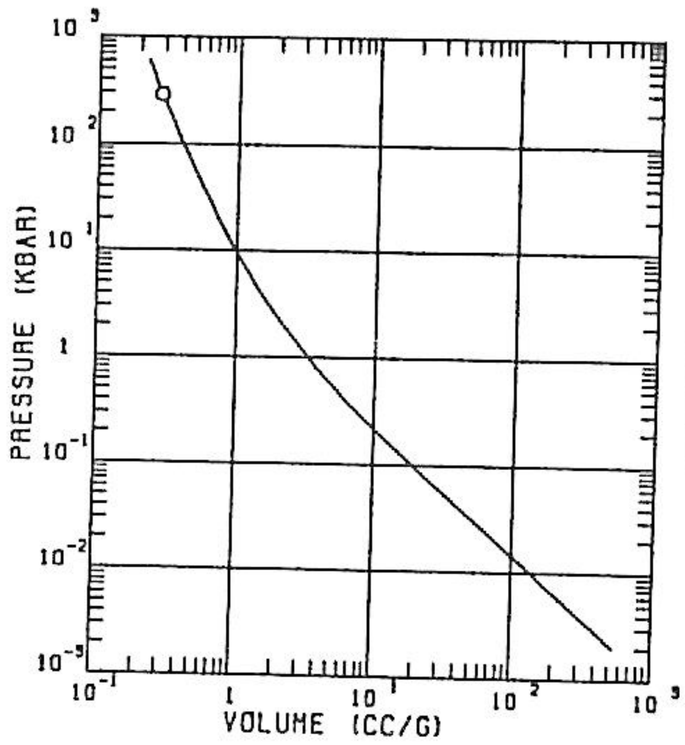
RDX/EXON/PB 80/10/10 VOL RHO = 2.7000 G/CC EO = 5.778934E+03 CAL/MOLE

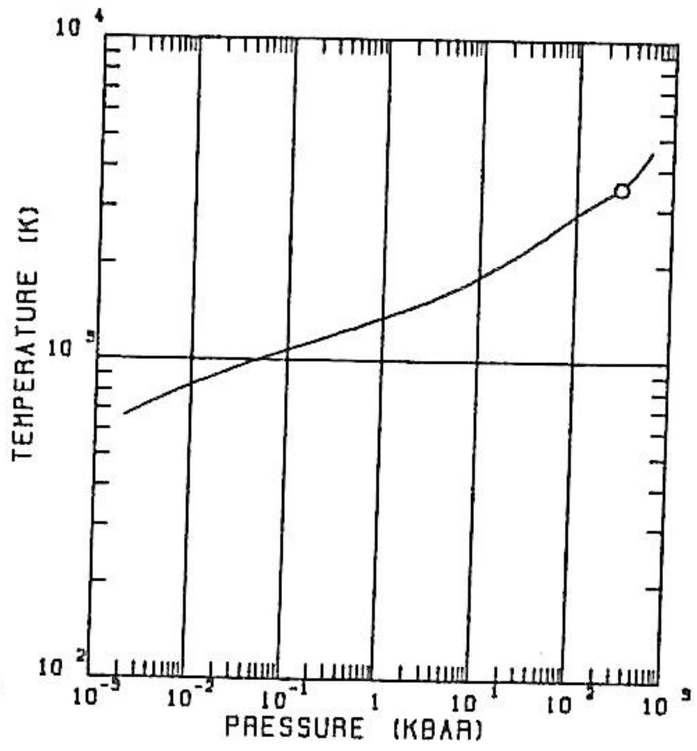
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

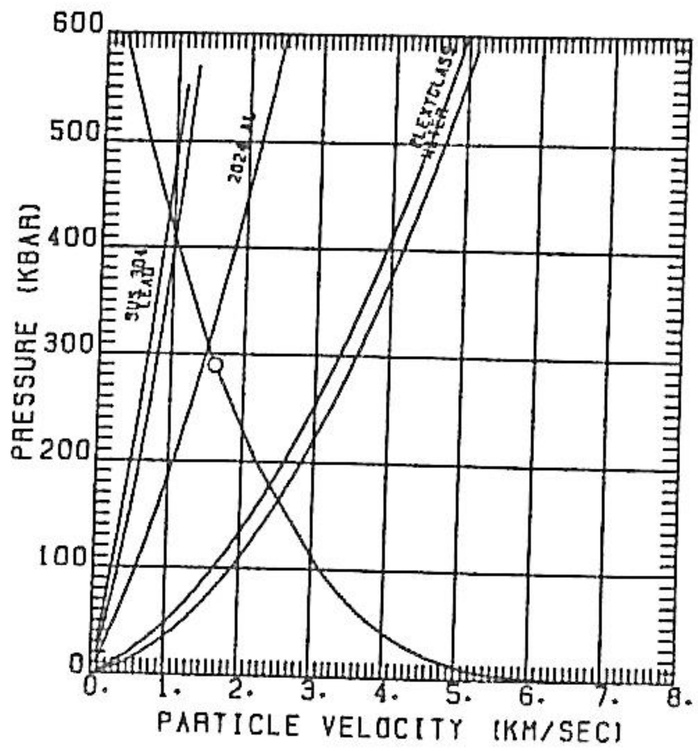
PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 C(S)	H2 PB(S)	O2	NH3	OH	H	CH4	NO	HCL
289.781	1.76261	1.02505	0.06910	1.94061	0.00000	0.00425	0.00017	0.00289	0.00197	0.00005	0.00000	0.00572	0.17270
	0.00000	0.34533	0.00000	0.00001	1.19604	0.54781							
200.000	1.75123	0.99390	0.14745	1.94120	0.00000	0.01209	0.00004	0.00544	0.00128	0.00007	0.00003	0.00199	0.17270
	0.00000	0.34533	0.00000	0.00000	1.14882	0.54781							
100.000	1.69903	0.89889	0.39242	1.93819	0.00000	0.05186	0.00000	0.01324	0.00038	0.00009	0.00062	0.00022	0.17270
	0.00000	0.34533	0.00000	0.00000	0.99827	0.54781							
80.000	1.67061	0.86533	0.48822	1.93668	0.00000	0.07411	0.00000	0.01637	0.00023	0.00008	0.00138	0.00010	0.17271
	0.00000	0.34534	0.00000	0.00000	0.93527	0.54781							
60.000	1.62524	0.82695	0.61053	1.93468	0.00000	0.10932	0.00000	0.02043	0.00012	0.00007	0.00345	0.00004	0.17271
	0.00000	0.34534	0.00000	0.00000	0.84926	0.54781							
50.000	1.59160	0.80692	0.68431	1.93348	0.00000	0.13470	0.00000	0.02285	0.00007	0.00006	0.00578	0.00002	0.17271
	0.00000	0.34534	0.00000	0.00000	0.79319	0.54781							
40.000	1.54561	0.78783	0.76852	1.93218	0.00000	0.16790	0.00000	0.02546	0.00004	0.00004	0.01022	0.00001	0.17271
	0.00000	0.34535	0.00000	0.00000	0.72363	0.54781							
30.000	1.48207	0.77344	0.86087	1.93102	0.00000	0.21083	0.00000	0.02778	0.00002	0.00003	0.01880	0.00000	0.17271
	0.00000	0.34535	0.00000	0.00000	0.63709	0.54781							
20.000	1.37956	0.77017	0.96994	1.93009	0.00000	0.26859	0.00000	0.02964	0.00001	0.00002	0.03979	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.51031	0.54781							
10.000	1.20338	0.80521	1.07605	1.93102	0.00000	0.33766	0.00000	0.02779	0.00000	0.00000	0.09473	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.31427	0.54781							
8.000	1.15222	0.82397	1.08971	1.93175	0.00000	0.35101	0.00000	0.02633	0.00000	0.00000	0.11473	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.26184	0.54781							
6.000	1.09200	0.85072	1.09642	1.93282	0.00000	0.36362	0.00000	0.02419	0.00000	0.00000	0.14013	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.20300	0.54781							
5.000	1.05822	0.86901	1.09363	1.93353	0.00000	0.36912	0.00000	0.02277	0.00000	0.00000	0.15534	0.00000	0.17273
	0.00000	0.34537	0.00000	0.00000	0.17224	0.54781							
4.000	1.02147	0.89225	1.08389	1.93439	0.00000	0.37390	0.00000	0.02105	0.00000	0.00000	0.17261	0.00000	0.17273
	0.00000	0.34537	0.00000	0.00000	0.14149	0.54781							
3.000	0.98017	0.92162	1.06647	1.93545	0.00000	0.37869	0.00000	0.01892	0.00000	0.00000	0.19246	0.00000	0.17274
	0.00000	0.34537	0.00000	0.00000	0.10973	0.54781							
2.000	0.93651	0.96559	1.02219	1.93682	0.00000	0.38097	0.00000	0.01618	0.00000	0.00000	0.21520	0.00000	0.17274
	0.00000	0.34539	0.00000	0.00000	0.08728	0.54781							
1.000	0.89024	1.04023	0.91917	1.93874	0.00000	0.38008	0.00000	0.01234	0.00000	0.00000	0.24166	0.00000	0.17275
	0.00000	0.34540	0.00000	0.00000	0.08916	0.54781							
0.800	0.88139	1.06349	0.88150	1.93926	0.00000	0.37925	0.00000	0.01132	0.00000	0.00000	0.24727	0.00000	0.17276
	0.00000	0.34540	0.00000	0.00000	0.09801	0.54781							
0.600	0.87445	1.09356	0.82832	1.93986	0.00000	0.37733	0.00000	0.01011	0.00000	0.00000	0.25260	0.00000	0.17276
	0.00000	0.34541	0.00000	0.00000	0.11575	0.54781							
0.500	0.87233	1.11238	0.79280	1.94021	0.00000	0.37582	0.00000	0.00941	0.00000	0.00000	0.25494	0.00000	0.17277
	0.00000	0.34542	0.00000	0.00000	0.13008	0.54781							
0.400	0.87194	1.13503	0.74789	1.94061	0.00000	0.37372	0.00000	0.00861	0.00000	0.00000	0.25678	0.00000	0.17277
	0.00000	0.34543	0.00000	0.00000	0.15048	0.54781							
0.300	0.87489	1.16361	0.68777	1.94108	0.00000	0.37041	0.00000	0.00767	0.00000	0.00000	0.25766	0.00000	0.17277
	0.00000	0.34544	0.00000	0.00000	0.18112	0.54781							
0.200	0.88488	1.20236	0.60031	1.94167	0.00000	0.36446	0.00000	0.00649	0.00000	0.00000	0.25651	0.00000	0.17278
	0.00000	0.34546	0.00000	0.00000	0.23100	0.54781							
0.100	0.91432	1.26262	0.45035	1.94250	0.00000	0.34941	0.00000	0.00485	0.00000	0.00000	0.25055	0.00000	0.17279
	0.00000	0.34549	0.00000	0.00000	0.32669	0.54781							
0.080	0.92594	1.27951	0.40495	1.94272	0.00000	0.34340	0.00000	0.00440	0.00000	0.00000	0.24807	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.35767	0.54781							
0.060	0.94252	1.29962	0.34816	1.94298	0.00000	0.33407	0.00000	0.00389	0.00000	0.00000	0.24484	0.00000	0.17281
	0.00000	0.34547	0.00000	0.00000	0.39757	0.54781							
0.050	0.95385	1.31124	0.31360	1.94313	0.00000	0.32720	0.00000	0.00359	0.00000	0.00000	0.24282	0.00000	0.17281
	0.00000	0.34550	0.00000	0.00000	0.42255	0.54781							
0.040	0.96835	1.32394	0.27369	1.94330	0.00000	0.31805	0.00000	0.00325	0.00000	0.00000	0.24040	0.00000	0.17281
	0.00000	0.34552	0.00000	0.00000	0.45216	0.54781							
0.030	0.98815	1.33794	0.22589	1.94349	0.00000	0.30466	0.00000	0.00286	0.00000	0.00000	0.23748	0.00000	0.17282
	0.00000	0.34554	0.00000	0.00000	0.48888	0.54781							
0.020	1.01851	1.35264	0.16615	1.94374	0.00000	0.28246	0.00000	0.00238	0.00000	0.00000	0.23376	0.00000	0.17283
	0.00000	0.34555	0.00000	0.00000	0.53767	0.54781							
0.010	1.07762	1.36273	0.08686	1.94407	0.00000	0.23543	0.00000	0.00171	0.00000	0.00000	0.22821	0.00000	0.17285
	0.00000	0.34555	0.00000	0.00000	0.61244	0.54781							
0.008	1.09842	1.36180	0.06794	1.94416	0.00000	0.21846	0.00000	0.00154	0.00000	0.00000	0.22642	0.00000	0.17286
	0.00000	0.34557	0.00000	0.00000	0.63408	0.54781							
0.006	1.12708	1.35758	0.04771	1.94426	0.00000	0.19503	0.00000	0.00133	0.00000	0.00000	0.22396	0.00000	0.17286
	0.00000	0.34558	0.00000	0.00000	0.66098	0.54781							
0.005	1.14617	1.35325	0.03730	1.94432	0.00000	0.17964	0.00000	0.00120	0.00000	0.00000	0.22220	0.00000	0.17287
	0.00000	0.34558	0.00000	0.00000	0.67752	0.54781							
0.004	1.17034	1.34635	0.02693	1.94439	0.00000	0.16058	0.00000	0.00107	0.00000	0.00000	0.21974	0.00000	0.17288
	0.00000	0.34560	0.00000	0.00000	0.69724	0.54781							
0.003	1.20296	1.33504	0.01695	1.94448	0.00000	0.13608	0.00000	0.00090	0.00000	0.00000	0.21580	0.00000	0.17289
	0.00000	0.34560	0.00000	0.00000	0.72243	0.54781							
0.002	1.25122	1.31536	0.00806	1.94458	0.00000	0.10304	0.00000	0.00070	0.00000	0.00000	0.20833	0.00000	0.17290
	0.00000	0.34564	0.00000	0.00000	0.75848	0.54781							
300.000	1.76297	1.02593	0.06593	1.94025	0.00000	0.00396	0.00020	0.00280	0.00212	0.00005	0.00000	0.00653	0.17269
	0.00000	0.34533	0.00000	0.00001	1.19833	0.54781							
400.000	1.76454	1.02718	0.04648	1.93443	0.00000	0.00229	0.00088	0.00225	0.00397	0.00005	0.00000	0.01871	0.17269
	0.00000	0.34533	0.00000	0.00001	1.21654	0.54781							
500.000	1.76406	1.01797	0.03862	1.92381	0.00000	0.00165	0.00241	0.00219	0.00637	0.00006	0.00000	0.04001	0.17268
	0.00000	0.34533	0.00000	0.00001	1.23361	0.54781							
600.000	1.76163	1.00157	0.04083	1.91026	0.00000	0.00160	0.00427	0.00288	0.00926	0.00008	0.00000	0.06642	0.17268
	0.00000	0.34533	0.00000	0.00002	1.24780	0.54781							

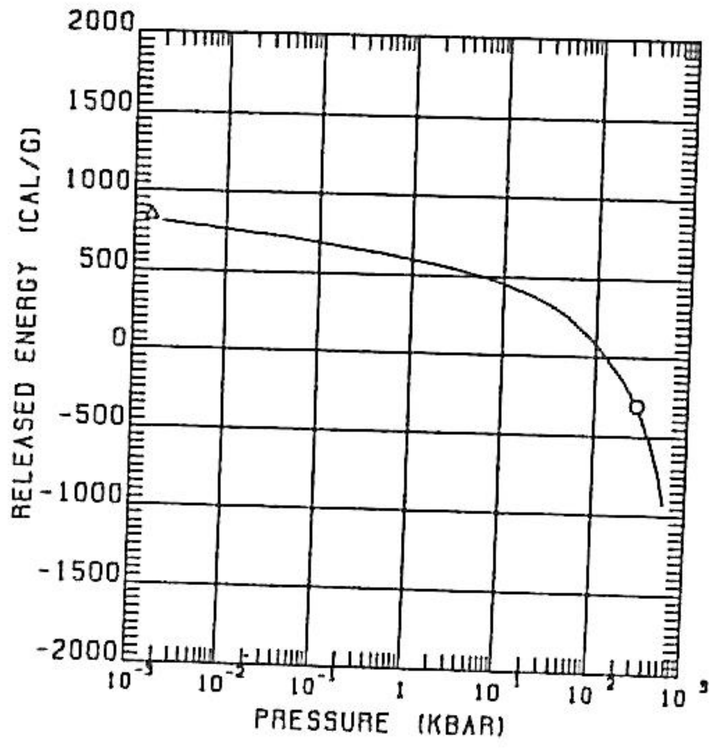
PRESS ;KBAR, PRODUCTS ;MOLES

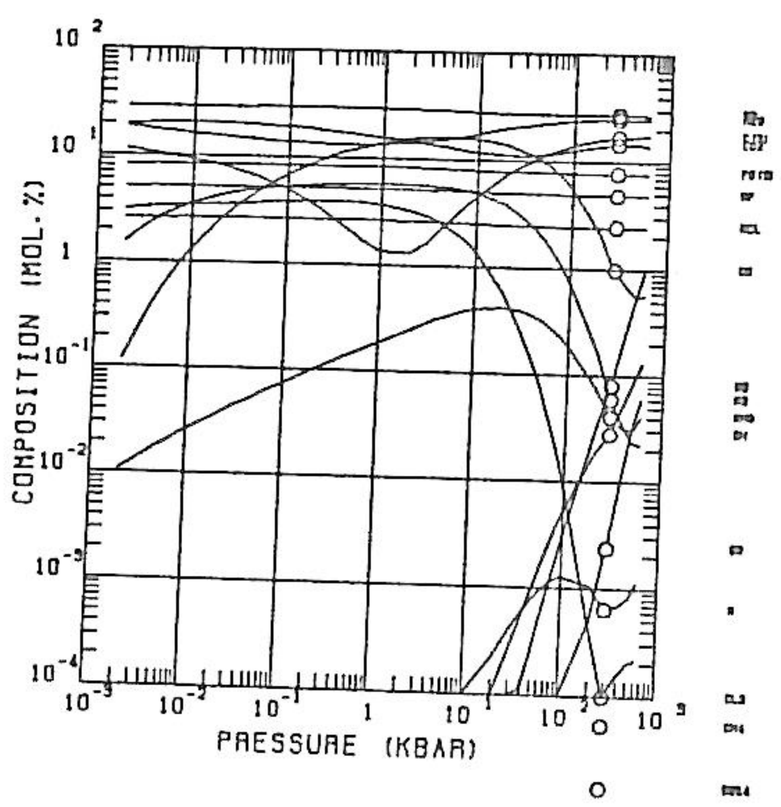
K-H-T ISENTROPE THRU C-J POINT











RDX/EXON/PB 80/10/10 VOL

RHO (G/CC)	2.700
E_0 (KCAL/MOLE)	5.78
D_{C-J}(M/SEC)	6681.
P_{C-J}(KBAR)	289.8
T_{C-J}(K)	3505.

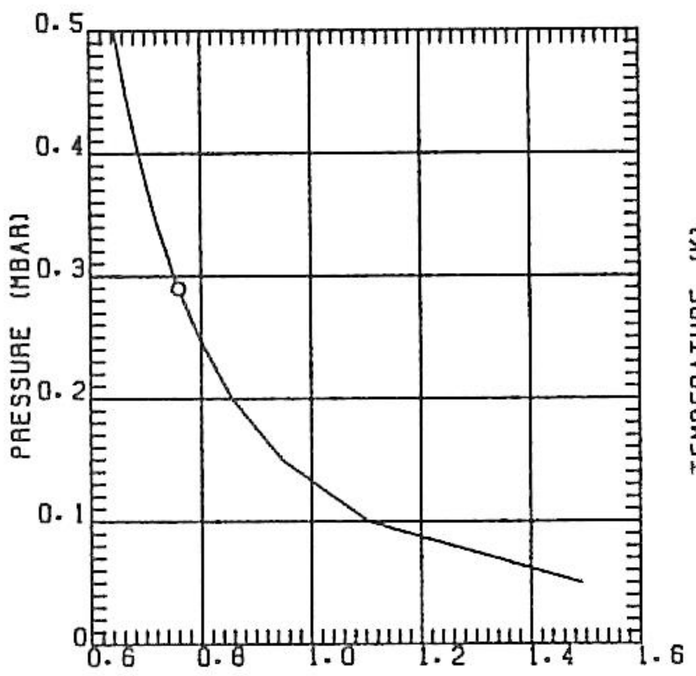
DATE 82-11-01

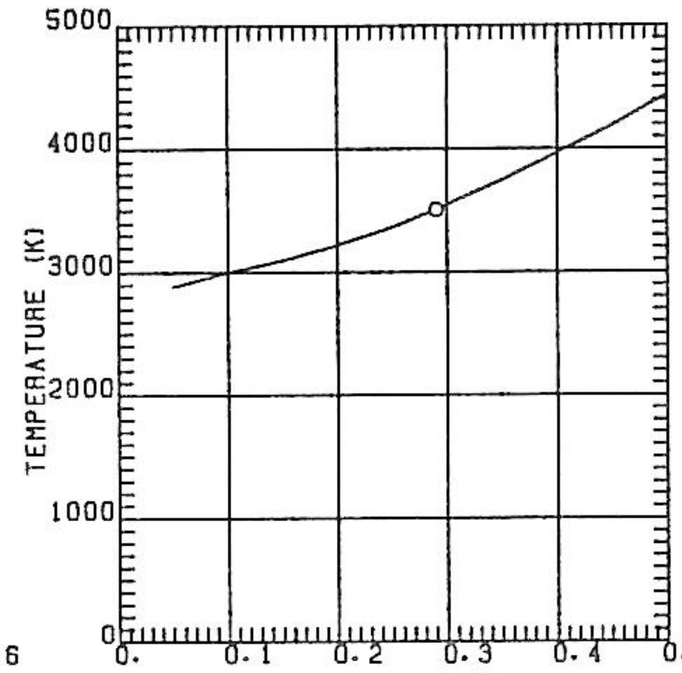
********** A K-H-T H U G O N I O T <<DATE 82-11-01>>**********

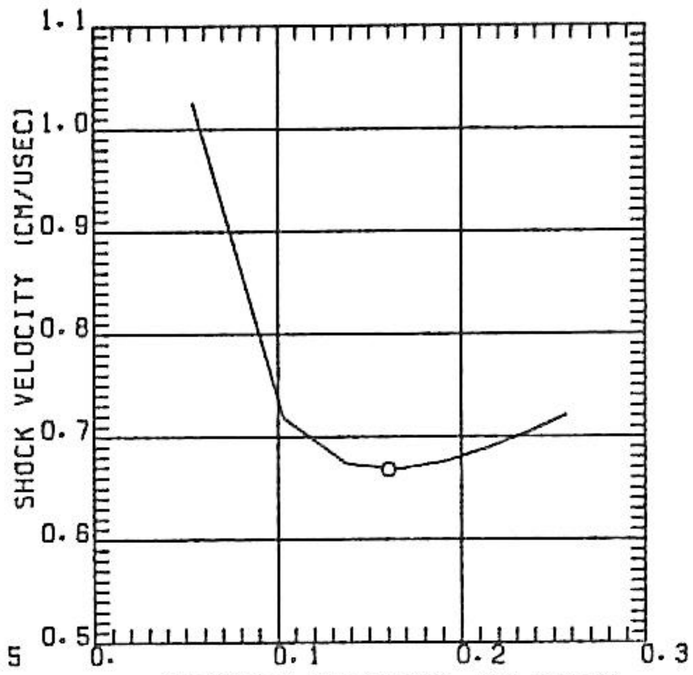
RDX/EXON/PB 80/10/10 VOL RHO = 2.7000 G/CC, EO = 5.778934E+03 CAL/MOLE

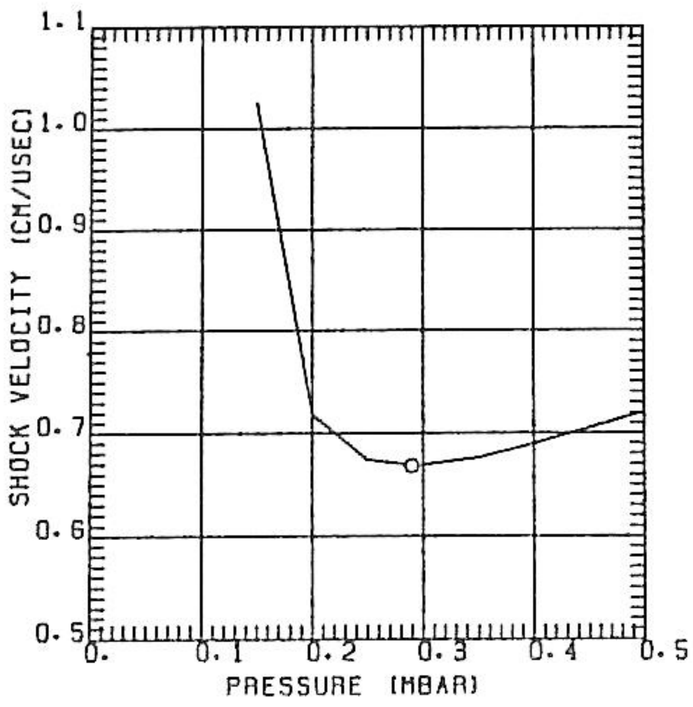
PRESSURE (KBAR)		500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.2384	0.2460	0.2548	0.2654	0.2783	0.2948	0.3173	0.3508	0.4090	0.5526
TEMP	(DEG K)	4437.7	4191.5	3959.5	3742.2	3543.4	3365.7	3215.5	3096.9	3002.5	2880.9
US	(M/SEC)	7208.2	7045.1	6891.9	6761.4	6684.9	6736.9	7189.9	10254.1	0.0	0.0
UP	(M/SEC)	2569.1	2365.7	2149.6	1917.2	1662.1	1374.4	1030.2	541.8	0.0	0.0
H2O	(MOLE)	1.7606	1.7624	1.7635	1.7637	1.7630	1.7605	1.7543	1.7373	1.6804	1.4077
CO2	(MOLE)	1.0038	1.0156	1.0231	1.0267	1.0259	1.0196	1.0033	0.9635	0.8616	0.6017
CO	(MOLE)	0.0537	0.0515	0.0523	0.0564	0.0660	0.0852	0.1262	0.2239	0.4853	1.2782
N2	(MOLE)	1.9174	1.9265	1.9331	1.9376	1.9402	1.9415	1.9417	1.9406	1.9368	1.9257
CF4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	(MOLE)	0.0025	0.0024	0.0026	0.0031	0.0040	0.0058	0.0102	0.0224	0.0657	0.2763
O2	(MOLE)	0.0033	0.0020	0.0010	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000
NH3	(MOLE)	0.0030	0.0027	0.0025	0.0025	0.0028	0.0034	0.0047	0.0079	0.0159	0.0384
OH	(MOLE)	0.0093	0.0067	0.0046	0.0032	0.0021	0.0014	0.0010	0.0008	0.0006	0.0004
H	(MOLE)	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001	0.0002	0.0004
CH4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0009	0.0151
NO	(MOLE)	0.0519	0.0342	0.0211	0.0121	0.0065	0.0033	0.0016	0.0008	0.0003	0.0001
HCL	(MOLE)	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727
CCL4	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF	(MOLE)	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453
F2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2	(MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S)	(MOLE)	1.2327	1.2232	1.2147	1.2071	1.1983	1.1854	1.1607	1.1027	0.9424	0.3951
PB(S)	(MOLE)	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478	0.5478

K-H-T HUGONIOT









RDX/EXON/PB 80/10/10 VOL
RHO (G/CC) 2.700
E_0 (KCAL/MOLE) 5.78

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

RDX/EXON/PB 70/10/20VOL RHO = 3.6500 G/CC EO = 4.409227E+03 CAL/MOLE

LN P = -5.43558598 E+00 -2.02666664 E+00LN V 3.20875943 E-01LN V*2 -4.86933999 E-02LN V*3 2.60335323 E-03LN V*4

LN T = 7.39865589 E+00 -2.82920778 E-01LN V 9.72471833 E-02LN V*2 -2.18249485 E-02LN V*3 1.62491458 E-03LN V*4

LN E = -1.97717094 E+00 2.18715191 E-01LNP 3.86747867 E-02LN P*2 3.15071782 E-03LN P*3 9.34672426 E-05LN P*4
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (631.692)	0.1663	4564.7 (4281.0)	-668.7	0.12798 (0.12503)	3.7081	78.6
500.000 (512.962)	0.1760	4178.3 (4075.8)	-525.8	0.12200 (0.12109)	3.6369	396.1
400.000 (404.215)	0.1881	3820.6 (3856.1)	-387.2	0.11620 (0.11678)	3.5554	747.3
300.000 (300.832)	0.2046	3460.9 (3604.1)	-247.0	0.11033 (0.11195)	3.4542	1154.9
* 269.061 (269.430)	0.2113	3344.7 (3515.6)	-201.6	0.10844 (0.11031)	3.4164	1298.7
200.000 (196.411)	0.2321	3199.2 (3277.1)	-120.7	0.10505 (0.10630)	3.3080	1687.9
100.000 (96.450)	0.2902	2828.7 (2814.9)	28.6	0.09880 (0.09911)	3.0640	2441.8
80.000 (77.149)	0.3124	2710.4 (2688.6)	66.3	0.09723 (0.09731)	2.9874	2648.7
60.000 (58.037)	0.3442	2559.8 (2539.2)	109.4	0.09542 (0.09530)	2.8899	2894.7
50.000 (48.537)	0.3664	2468.2 (2451.5)	133.7	0.09441 (0.09419)	2.8288	3039.9
40.000 (39.043)	0.3961	2361.1 (2350.9)	160.5	0.09329 (0.09297)	2.7545	3207.6
30.000 (28.883)	0.4429	2234.2 (2221.9)	190.5	0.09203 (0.09160)	2.6519	3425.1
20.000 (19.716)	0.5133	2070.4 (2074.3)	226.6	0.09052 (0.09003)	2.5227	3678.3
10.000 (10.174)	0.6754	1841.2 (1855.7)	274.4	0.08852 (0.08805)	2.3016	4067.3
8.000 (8.197)	0.7430	1779.6 (1793.4)	286.9	0.08799 (0.08756)	2.2305	4182.8
6.000 (6.184)	0.8453	1707.6 (1718.2)	301.6	0.08738 (0.08701)	2.1387	4326.0
5.000 (5.165)	0.9207	1665.5 (1673.6)	310.2	0.08702 (0.08670)	2.0807	4413.5
4.000 (4.134)	1.0266	1617.7 (1621.8)	320.1	0.08661 (0.08636)	2.0099	4517.9
3.000 (3.091)	1.1904	1561.5 (1559.6)	331.7	0.08612 (0.08597)	1.9192	4648.3
2.000 (2.046)	1.4868	1489.5 (1480.9)	346.8	0.08549 (0.08547)	1.7944	4823.4
1.000 (1.008)	2.2604	1383.4 (1368.5)	369.8	0.08453 (0.08473)	1.5948	5102.3
0.800 (0.803)	2.6139	1352.6 (1337.6)	376.6	0.08424 (0.08450)	1.5357	5187.2
0.600 (0.599)	3.1775	1314.5 (1300.8)	385.1	0.08389 (0.08420)	1.4639	5294.1
0.500 (0.497)	3.6149	1291.7 (1278.9)	390.2	0.08367 (0.08401)	1.4211	5360.7
0.400 (0.396)	4.2522	1264.0 (1253.7)	396.5	0.08341 (0.08377)	1.3722	5440.7
0.300 (0.296)	5.2844	1229.3 (1222.9)	404.5	0.08308 (0.08345)	1.3151	5542.1
0.200 (0.197)	7.2787	1181.8 (1181.8)	415.5	0.08261 (0.08297)	1.2469	5682.1
0.100 (0.098)	12.9470	1104.1 (1113.5)	433.7	0.08185 (0.08209)	1.1663	5913.7
0.080 (0.079)	15.6678	1080.2 (1091.1)	439.3	0.08162 (0.08180)	1.1499	5986.4
0.060 (0.059)	20.0782	1049.8 (1061.6)	446.4	0.08132 (0.08141)	1.1350	6078.7
0.050 (0.050)	23.5144	1030.8 (1042.4)	450.8	0.08114 (0.08116)	1.1289	6136.5
0.040 (0.040)	28.5547	1008.0 (1018.6)	456.0	0.08092 (0.08086)	1.1247	6206.5
0.030 (0.030)	36.7046	979.0 (987.1)	462.6	0.08065 (0.08049)	1.1237	6295.7
0.020 (0.020)	52.3184	938.9 (941.9)	471.5	0.08027 (0.07998)	1.1294	6419.3
0.010 (0.010)	95.8453	871.7 (865.6)	485.8	0.07968 (0.07927)	1.1505	6625.1
0.008 (0.008)	116.4491	850.5 (842.2)	490.1	0.07950 (0.07910)	1.1586	6689.8
0.006 (0.006)	149.5604	823.0 (813.7)	495.4	0.07927 (0.07894)	1.1685	6771.8
0.005 (0.005)	175.1846	805.6 (796.9)	498.8	0.07913 (0.07888)	1.1742	6823.0
0.004 (0.004)	212.5234	784.4 (777.9)	502.7	0.07897 (0.07886)	1.1801	6884.7
0.003 (0.003)	272.4119	757.1 (756.3)	507.6	0.07876 (0.07892)	1.1853	6962.5
0.002 (0.002)	385.8867	718.6 (732.8)	514.1	0.07849 (0.07922)	1.1863	7069.0

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

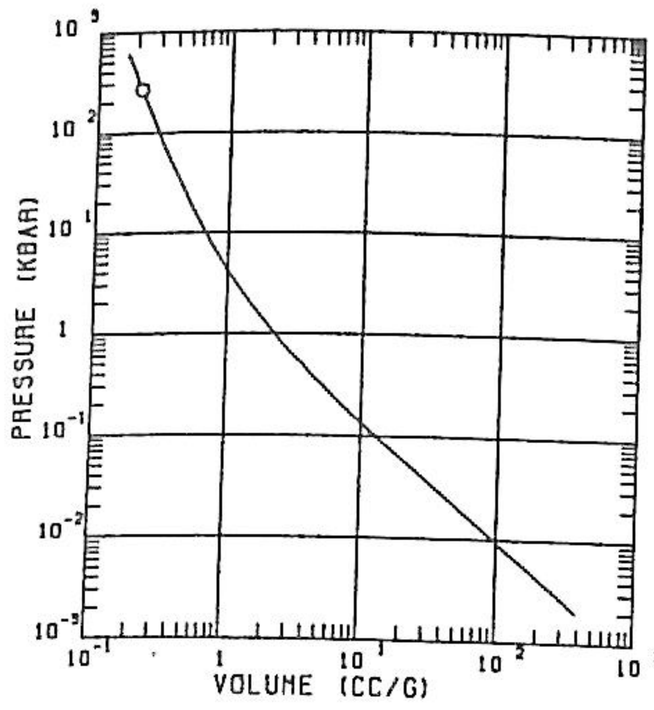
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

RDX/EXON/PB 70/10/20VOL RHO = 3.6500 G/CC EO = 4.409227E+03 CAL/MOLE

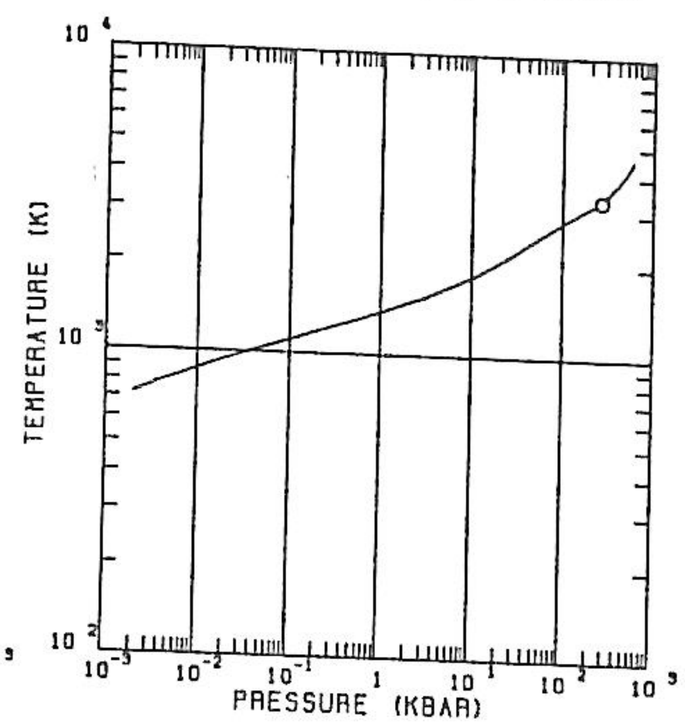
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

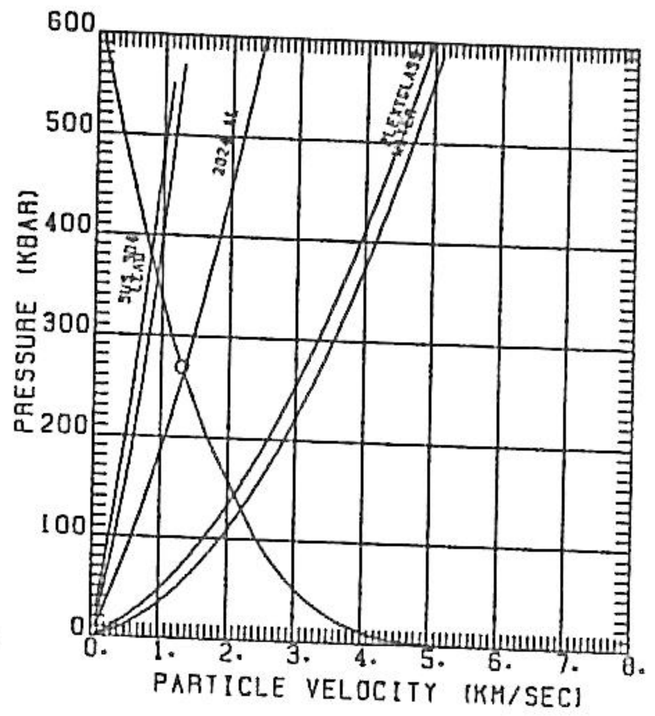
PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 C(S)	H2 PB(S)	O2	NH3	OH	H	CH4	NO	HCL
269.061	1.52155	0.91023	0.05713	1.69909	0.00000	0.00355	0.00008	0.00227	0.00116	0.00003	0.00000	0.00315	0.17270
	0.00000	0.34533	0.00000	0.00001	1.07973	1.09561							
200.000	1.51425	0.88933	0.10843	1.69916	0.00000	0.00851	0.00002	0.00390	0.00084	0.00004	0.00002	0.00137	0.17270
	0.00000	0.34533	0.00000	0.00000	1.04931	1.09561							
100.000	1.47222	0.80768	0.31559	1.69656	0.00000	0.04034	0.00000	0.01032	0.00027	0.00006	0.00044	0.00016	0.17270
	0.00000	0.34533	0.00000	0.00000	0.92338	1.09561							
80.000	1.44833	0.77699	0.40103	1.69524	0.00000	0.05904	0.00000	0.01303	0.00017	0.00006	0.00103	0.00008	0.17270
	0.00000	0.34533	0.00000	0.00000	0.86804	1.09561							
60.000	1.40923	0.74043	0.51340	1.69347	0.00000	0.08946	0.00000	0.01663	0.00009	0.00005	0.00269	0.00003	0.17270
	0.00000	0.34533	0.00000	0.00000	0.79057	1.09561							
50.000	1.37968	0.72051	0.58282	1.69238	0.00000	0.11187	0.00000	0.01883	0.00006	0.00004	0.00462	0.00001	0.17271
	0.00000	0.34534	0.00000	0.00000	0.73914	1.09561							
40.000	1.33877	0.70062	0.66355	1.69117	0.00000	0.14168	0.00000	0.02125	0.00003	0.00004	0.00836	0.00001	0.17271
	0.00000	0.34534	0.00000	0.00000	0.67455	1.09561							
30.000	1.28144	0.68383	0.75448	1.69005	0.00000	0.18093	0.00000	0.02348	0.00002	0.00003	0.01573	0.00000	0.17271
	0.00000	0.34534	0.00000	0.00000	0.59304	1.09561							
20.000	1.18815	0.67490	0.86565	1.68911	0.00000	0.23490	0.00000	0.02537	0.00001	0.00001	0.03398	0.00000	0.17271
	0.00000	0.34535	0.00000	0.00000	0.47257	1.09561							
10.000	1.02759	0.69587	0.98428	1.68979	0.00000	0.30164	0.00000	0.02402	0.00000	0.00000	0.08190	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.28503	1.09561							
8.000	0.98093	0.70903	1.00462	1.69040	0.00000	0.31538	0.00000	0.02280	0.00000	0.00000	0.09928	0.00000	0.17273
	0.00000	0.34535	0.00000	0.00000	0.23416	1.09561							
6.000	0.92649	0.72861	1.01991	1.69131	0.00000	0.32872	0.00000	0.02097	0.00000	0.00000	0.12119	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.17741	1.09561							
5.000	0.89617	0.74242	1.02261	1.69192	0.00000	0.33480	0.00000	0.01975	0.00000	0.00000	0.13423	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.14787	1.09561							
4.000	0.86318	0.76010	1.02025	1.69267	0.00000	0.34054	0.00000	0.01827	0.00000	0.00000	0.14897	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.11781	1.09561							
3.000	0.82658	0.78310	1.01086	1.69359	0.00000	0.34629	0.00000	0.01643	0.00000	0.00000	0.16577	0.00000	0.17274
	0.00000	0.34538	0.00000	0.00000	0.08739	1.09561							
2.000	0.78758	0.81784	0.98038	1.69477	0.00000	0.35066	0.00000	0.01406	0.00000	0.00000	0.18486	0.00000	0.17274
	0.00000	0.34539	0.00000	0.00000	0.06406	1.09561							
1.000	0.74599	0.87851	0.90063	1.69644	0.00000	0.35365	0.00000	0.01073	0.00000	0.00000	0.20665	0.00000	0.17275
	0.00000	0.34539	0.00000	0.00000	0.06136	1.09561							
0.800	0.73825	0.89831	0.86879	1.69688	0.00000	0.35379	0.00000	0.00984	0.00000	0.00000	0.21112	0.00000	0.17275
	0.00000	0.34540	0.00000	0.00000	0.06894	1.09561							
0.600	0.73183	0.92383	0.82416	1.69741	0.00000	0.35355	0.00000	0.00879	0.00000	0.00000	0.21523	0.00000	0.17276
	0.00000	0.34542	0.00000	0.00000	0.08389	1.09561							
0.500	0.72919	0.93926	0.79594	1.69771	0.00000	0.35372	0.00000	0.00818	0.00000	0.00000	0.21692	0.00000	0.17276
	0.00000	0.34541	0.00000	0.00000	0.09500	1.09561							
0.400	0.72839	0.95884	0.75758	1.69806	0.00000	0.35317	0.00000	0.00749	0.00000	0.00000	0.21811	0.00000	0.17277
	0.00000	0.34541	0.00000	0.00000	0.11256	1.09561							
0.300	0.73024	0.98387	0.70569	1.69847	0.00000	0.35210	0.00000	0.00667	0.00000	0.00000	0.21834	0.00000	0.17277
	0.00000	0.34541	0.00000	0.00000	0.13921	1.09561							
0.200	0.73769	1.01854	0.62889	1.69898	0.00000	0.34965	0.00000	0.00565	0.00000	0.00000	0.21660	0.00000	0.17277
	0.00000	0.34543	0.00000	0.00000	0.18306	1.09561							
0.100	0.76025	1.07458	0.49426	1.69969	0.00000	0.34206	0.00000	0.00422	0.00000	0.00000	0.21017	0.00000	0.17279
	0.00000	0.34547	0.00000	0.00000	0.26807	1.09561							
0.080	0.76916	1.09103	0.45246	1.69989	0.00000	0.33879	0.00000	0.00384	0.00000	0.00000	0.20764	0.00000	0.17279
	0.00000	0.34549	0.00000	0.00000	0.29597	1.09561							
0.060	0.78170	1.11114	0.39970	1.70011	0.00000	0.33351	0.00000	0.00339	0.00000	0.00000	0.20434	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.33189	1.09561							
0.050	0.79029	1.12318	0.36703	1.70024	0.00000	0.32941	0.00000	0.00313	0.00000	0.00000	0.20229	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.35460	1.09561							
0.040	0.80112	1.13683	0.32891	1.70038	0.00000	0.32392	0.00000	0.00285	0.00000	0.00000	0.19983	0.00000	0.17281
	0.00000	0.34549	0.00000	0.00000	0.38152	1.09561							
0.030	0.81588	1.15282	0.28218	1.70055	0.00000	0.31565	0.00000	0.00251	0.00000	0.00000	0.19683	0.00000	0.17281
	0.00000	0.34550	0.00000	0.00000	0.41528	1.09561							
0.020	0.83830	1.17188	0.22164	1.70076	0.00000	0.30142	0.00000	0.00210	0.00000	0.00000	0.19304	0.00000	0.17282
	0.00000	0.34555	0.00000	0.00000	0.46059	1.09561							
0.010	0.88173	1.19362	0.13474	1.70104	0.00000	0.26934	0.00000	0.00154	0.00000	0.00000	0.18778	0.00000	0.17284
	0.00000	0.34555	0.00000	0.00000	0.53101	1.09561							
0.008	0.89694	1.19736	0.11205	1.70112	0.00000	0.25724	0.00000	0.00139	0.00000	0.00000	0.18633	0.00000	0.17284
	0.00000	0.34555	0.00000	0.00000	0.55139	1.09561							
0.006	0.91794	1.19982	0.08616	1.70120	0.00000	0.23986	0.00000	0.00122	0.00000	0.00000	0.18465	0.00000	0.17285
	0.00000	0.34555	0.00000	0.00000	0.57652	1.09561							
0.005	0.93205	1.19993	0.07182	1.70125	0.00000	0.22791	0.00000	0.00111	0.00000	0.00000	0.18364	0.00000	0.17286
	0.00000	0.34558	0.00000	0.00000	0.59174	1.09561							
0.004	0.95001	1.19857	0.05658	1.70131	0.00000	0.21262	0.00000	0.00100	0.00000	0.00000	0.18238	0.00000	0.17286
	0.00000	0.34558	0.00000	0.00000	0.60962	1.09561							
0.003	0.97449	1.19444	0.04037	1.70138	0.00000	0.19179	0.00000	0.00087	0.00000	0.00000	0.18066	0.00000	0.17287
	0.00000	0.34557	0.00000	0.00000	0.63167	1.09561							
0.002	1.01133	1.18444	0.02354	1.70146	0.00000	0.16103	0.00000	0.00070	0.00000	0.00000	0.17773	0.00000	0.17289
	0.00000	0.34561	0.00000	0.00000	0.66145	1.09561							
300.000	1.52241	0.91240	0.04969	1.69834	0.00000	0.00285	0.00015	0.00204	0.00151	0.00003	0.00000	0.00488	0.17269
	0.00000	0.34533	0.00000	0.00001	1.08498	1.09561							
400.000	1.52328	0.91217	0.03668	1.69350	0.00000	0.00173	0.00069	0.00171	0.00302	0.00004	0.00000	0.01489	0.17269
	0.00000	0.34533	0.00000	0.00001	1.09823	1.09561							
500.000	1.52257	0.90313	0.03203	1.68416	0.00000	0.00132	0.00201	0.00174	0.00518	0.00005	0.00000	0.03353	0.17268
	0.00000	0.34533	0.00000	0.00002	1.11192	1.09561							
600.000	1.52018	0.88739	0.03549	1.67173	0.00000	0.00135	0.00373	0.00238	0.00794	0.00007	0.00000	0.05776	0.17267
	0.00000	0.34532	0.00000	0.00002	1.12421	1.09561							

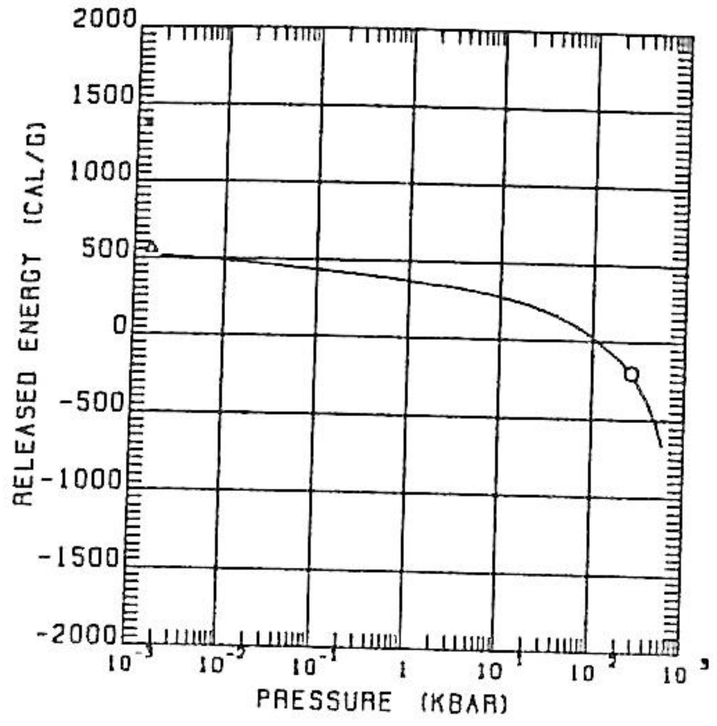
PRESS ;KBAR, PRODUCTS ;MOLES

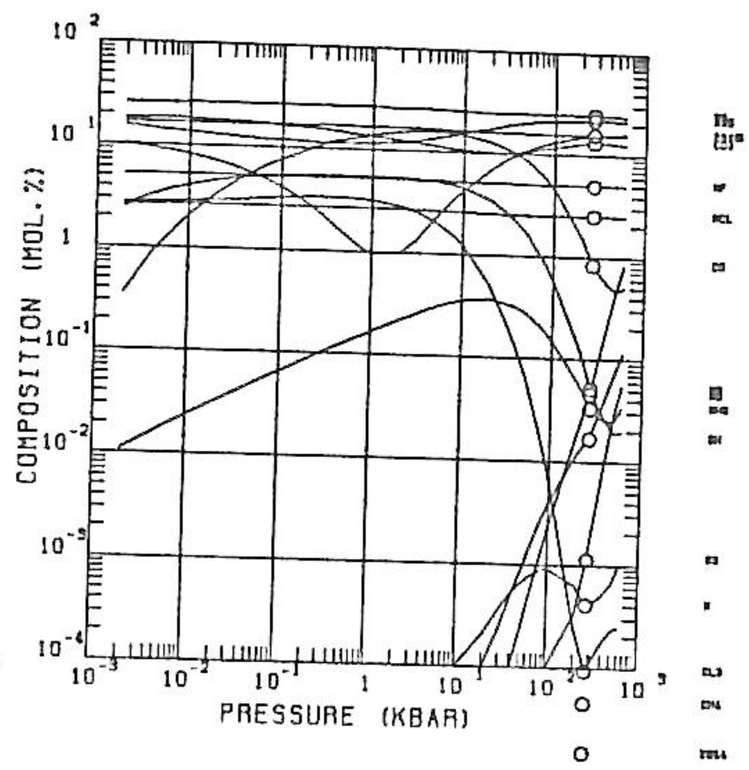


K-H-T ISENTROPE THRU C-J POINT









RDX/EXON/PB 70/10/20VOL

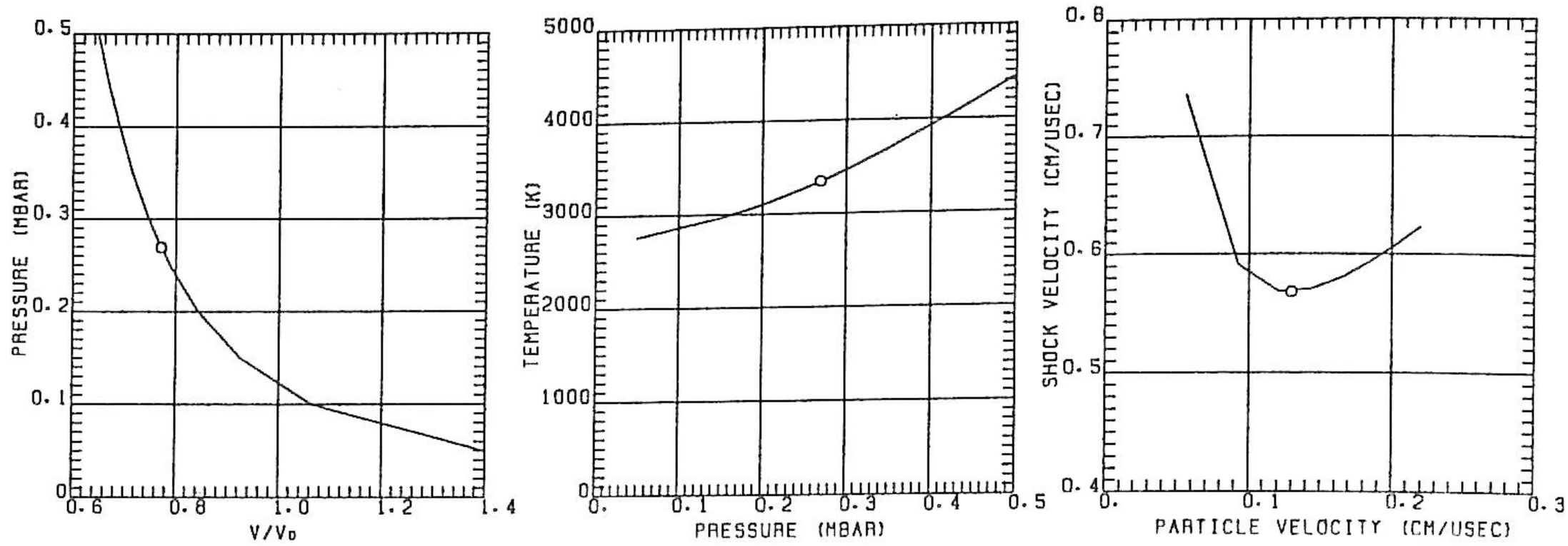
RHO (G/CC)	3.650
E_0 (KCAL/MOLE)	4.41
D_{C-J}(M/SEC)	5676.
P_{C-J}(KBAR)	269.1
T_{C-J}(K)	3345.

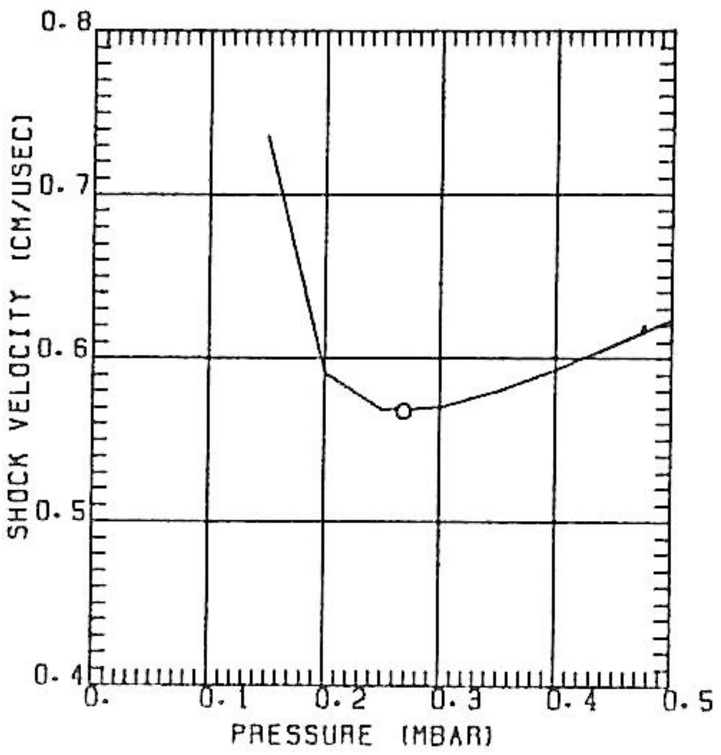
DATE 82-11-01

********** A K-H-T H U G O N I O T <<DATE 82-11-01>>**********

RDX/EXON/PB 70/10/20VOL RHO = 3.6500 G/CC, EO = 4.409227E+03 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.1773	0.1826	0.1887	0.1959	0.2047	0.2159	0.2310	0.2532	0.2912	0.3829
TEMP (DEG K)	4445.7	4179.6	3927.2	3689.2	3469.0	3271.7	3102.4	2968.2	2868.4	2760.1
US (M/SEC)	6230.0	6079.0	5932.8	5800.1	5700.5	5684.0	5909.0	7354.7	0.0	0.0
UP (M/SEC)	2198.8	2028.1	1847.2	1653.2	1441.8	1205.0	927.3	558.8	0.0	0.0
H2O (MOLE)	1.5190	1.5209	1.5220	1.5226	1.5223	1.5208	1.5169	1.5060	1.4677	1.2710
CO2 (MOLE)	0.8881	0.8996	0.9072	0.9114	0.9120	0.9084	0.8980	0.8714	0.7978	0.5863
CO (MOLE)	0.0481	0.0448	0.0439	0.0454	0.0505	0.0625	0.0890	0.1538	0.3398	0.9597
N2 (MOLE)	1.6774	1.6858	1.6920	1.6959	1.6983	1.6994	1.6996	1.6989	1.6962	1.6876
CF4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2 (MOLE)	0.0021	0.0021	0.0021	0.0024	0.0029	0.0041	0.0069	0.0147	0.0437	0.1959
O2 (MOLE)	0.0030	0.0017	0.0009	0.0004	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0026	0.0022	0.0020	0.0020	0.0021	0.0024	0.0033	0.0053	0.0110	0.0283
OH (MOLE)	0.0083	0.0057	0.0038	0.0024	0.0015	0.0010	0.0006	0.0004	0.0003	0.0002
H (MOLE)	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0005	0.0098
NO (MOLE)	0.0462	0.0297	0.0177	0.0097	0.0050	0.0024	0.0011	0.0005	0.0002	0.0001
HCL (MOLE)	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727
CCL4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF (MOLE)	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453
F2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	1.1110	1.1027	1.0959	1.0903	1.0846	1.0761	1.0601	1.0218	0.9090	0.4913
PB(S) (MOLE)	1.0956	1.0956	1.0956	1.0956	1.0956	1.0956	1.0956	1.0956	1.0956	1.0956





RDX/EXON/PB 70/10/20VOL
RHO (G/CC) 3.650
E_0 (KCAL/MOLE) 4.41

DATE 82-11-01

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

RDX/EXON/PB 60/10/30VOL RHO = 4.6000 G/CC EO = 3.039523E+03 CAL/MOLE

LN P = -6.08229733 E+00 -1.86850643 E+00LN V 3.20969224 E-01LN V*2 -5.97907007 E-02LN V*3 4.00540233 E-03LN V*4

LN T = 7.32499695 E+00 -2.23220289 E-01LN V 8.03387165 E-02LN V*2 -2.08211169 E-02LN V*3 1.76000409 E-03LN V*4

LN E = -2.07015610 E+00 1.50114477 E-01LNP 2.65490822 E-02LN P*2 2.15773913 E-03LN P*3 6.38198107 E-05LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (516.951)	0.1402	4140.1 (3857.1)	-407.0	0.11703 (0.11508)	3.9434	175.0
400.000 (406.774)	0.1491	3750.2 (3667.7)	-302.0	0.11264 (0.11225)	3.8501	478.1
300.000 (302.331)	0.1613	3367.3 (3449.1)	-197.3	0.10826 (0.10904)	3.7345	828.3
* 242.770 (244.143)	0.1709	3141.9 (3301,8)	-135.0	0.10565 (0.10696)	3.6511	1062.8
200.000 (198.515)	0.1809	3062.3 (3166.8)	-100.3	0.10419 (0.10524)	3.5702	1277.1
100.000 (97.313)	0.2228	2748.1 (2754.0)	0.8	0.09997 (0.10030)	3.2912	1920.9
80.000 (77.890)	0.2386	2644.7 (2640.2)	26.5	0.09889 (0.09905)	3.2040	2095.9
60.000 (58.632)	0.2611	2511.2 (2504.3)	56.1	0.09765 (0.09765)	3.0928	2303.8
50.000 (49.045)	0.2768	2429.1 (2424.0)	72.7	0.09696 (0.09686)	3.0230	2426.4
40.000 (39.460)	0.2977	2332.0 (2331.3)	91.2	0.09618 (0.09600)	2.9380	2568.0
30.000 (28.824)	0.3321	2215.6 (2206.5)	112.1	0.09531 (0.09504)	2.8156	2758.7
20.000 (19.757)	0.3812	2063.5 (2069.9)	137.2	0.09426 (0.09392)	2.6690	2968.9
10.000 (10.197)	0.4946	1847.0 (1862.5)	170.7	0.09286 (0.09251)	2.4150	3294.6
8.000 (8.203)	0.5420	1788.4 (1802.4)	179.5	0.09249 (0.09216)	2.3326	3391.8
6.000 (6.175)	0.6140	1719.5 (1729.4)	189.9	0.09206 (0.09177)	2.2262	3512.3
5.000 (5.149)	0.6670	1678.9 (1685.8)	196.0	0.09180 (0.09155)	2.1590	3586.0
4.000 (4.113)	0.7417	1632.7 (1635.1)	203.0	0.09151 (0.09131)	2.0768	3673.8
3.000 (3.069)	0.8572	1578.0 (1574.0)	211.2	0.09116 (0.09103)	1.9717	3783.4
2.000 (2.026)	1.0668	1507.9 (1496.5)	222.0	0.09071 (0.09068)	1.8277	3930.5
1.000 (0.997)	1.6157	1404.0 (1386.0)	238.4	0.09003 (0.09016)	1.6000	4164.3
0.800 (0.794)	1.8683	1374.3 (1355.7)	243.1	0.08983 (0.09000)	1.5334	4235.7
0.600 (0.593)	2.2716	1337.3 (1319.8)	249.1	0.08958 (0.08979)	1.4537	4325.4
0.500 (0.494)	2.5814	1313.7 (1298.8)	253.0	0.08941 (0.08965)	1.4074	4380.8
0.400 (0.395)	3.0373	1286.5 (1274.5)	257.6	0.08922 (0.08948)	1.3548	4447.9
0.300 (0.296)	3.7771	1252.3 (1245.0)	263.3	0.08898 (0.08925)	1.2946	4533.2
0.200 (0.197)	5.2100	1205.7 (1205.8)	271.3	0.08865 (0.08891)	1.2256	4651.2
0.100 (0.099)	9.2978	1129.7 (1140.7)	284.4	0.08810 (0.08828)	1.1513	4847.6
0.080 (0.080)	11.2649	1106.4 (1119.2)	288.4	0.08793 (0.08807)	1.1383	4909.5
0.060 (0.060)	14.4595	1076.9 (1090.9)	293.6	0.08772 (0.08779)	1.1283	4988.5
0.050 (0.050)	16.9535	1058.6 (1072.4)	296.8	0.08758 (0.08761)	1.1253	5038.1
0.040 (0.040)	20.6179	1036.7 (1049.2)	300.6	0.08742 (0.08739)	1.1245	5098.3
0.030 (0.030)	26.5579	1009.0 (1018.6)	305.4	0.08722 (0.08712)	1.1273	5175.1
0.020 (0.020)	37.9829	970.9 (974.7)	311.9	0.08695 (0.08675)	1.1357	5281.9
0.010 (0.010)	70.0671	907.8 (900.9)	322.4	0.08651 (0.08622)	1.1503	5459.5
0.008 (0.008)	85.3506	888.2 (878.6)	325.6	0.08638 (0.08609)	1.1520	5515.3
0.006 (0.006)	110.0292	862.9 (852.0)	329.6	0.08621 (0.08597)	1.1503	5585.9
0.005 (0.005)	129.2087	847.0 (836.6)	332.1	0.08611 (0.08592)	1.1462	5629.7
0.004 (0.004)	157.2742	827.7 (819.7)	335.0	0.08598 (0.08590)	1.1373	5682.6
0.003 (0.003)	202.5382	802.9 (801.7)	338.7	0.08583 (0.08594)	1.1185	5749.2
0.002 (0.002)	288.9905	768.1 (785.2)	343.7	0.08562 (0.08615)	1.0754	5839.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-01>> **********

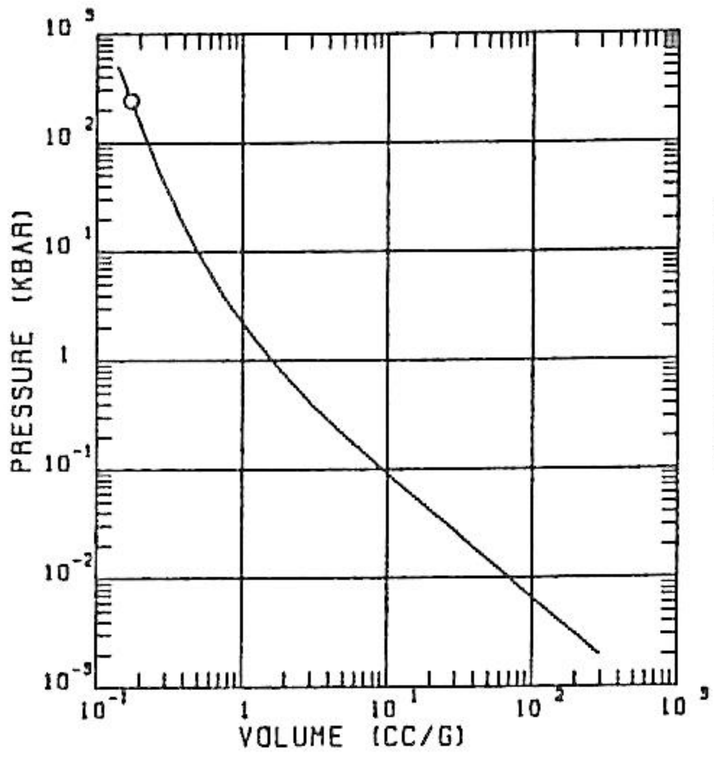
RDX/EXON/PB 60/10/30VOL RHO = 4.6000 G/CC EO = 3.039523E+03 CAL/MOLE

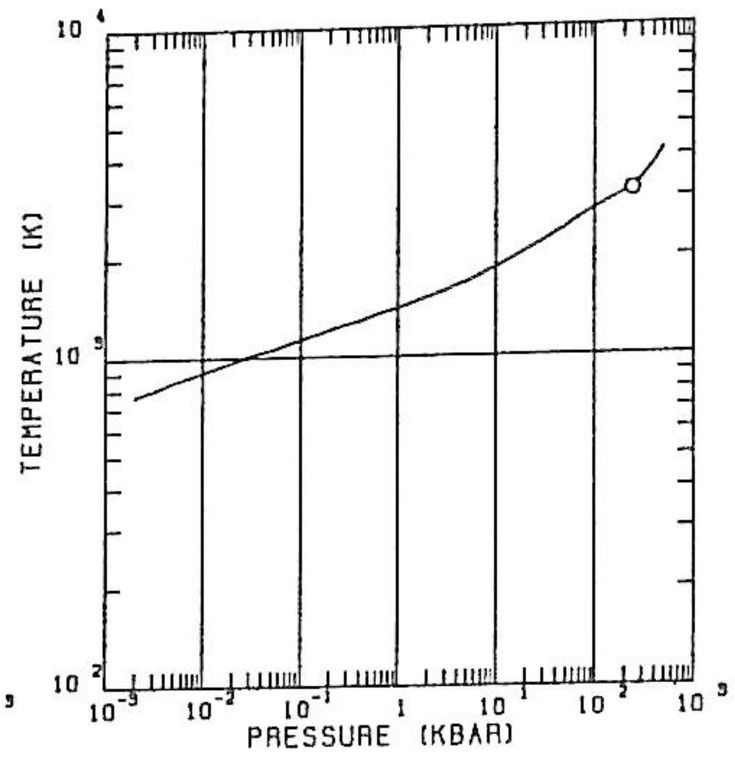
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

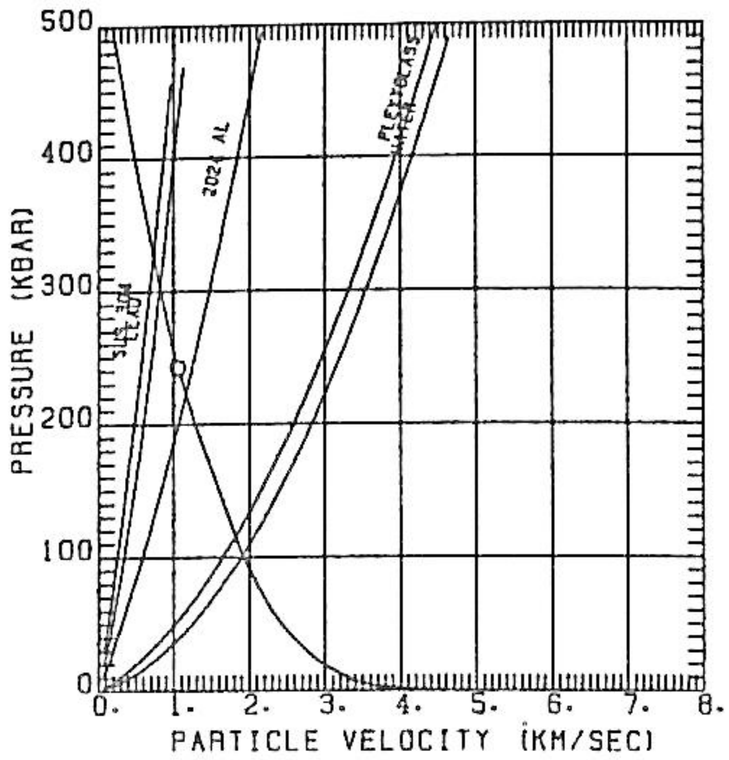
PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 C(S)	H2 PB(S)	O2	NH3	OH	H	CH4	NO	HCL
242.770	1.28024	0.79478	0.04555	1.45714	0.00000	0.00289	0.00003	0.00170	0.00056	0.00001	0.00000	0.00139	0.17270
	0.00000	0.34533	0.00000	0.00001	0.96364	1.64342							
200.000	1.27669	0.78409	0.07120	1.45703	0.00000	0.00528	0.00001	0.00250	0.00047	0.00002	0.00001	0.00081	0.17270
	0.00000	0.34533	0.00000	0.00000	0.94868	1.64342							
100.000	1.24556	0.71862	0.23430	1.45493	0.00000	0.02865	0.00000	0.00741	0.00017	0.00004	0.00027	0.00010	0.17270
	0.00000	0.34534	0.00000	0.00000	0.85077	1.64342							
80.000	1.22695	0.69212	0.30603	1.45386	0.00000	0.04321	0.00000	0.00960	0.00011	0.00004	0.00067	0.00005	0.17270
	0.00000	0.34533	0.00000	0.00000	0.80515	1.64342							
60.000	1.19534	0.65877	0.40442	1.45236	0.00000	0.06786	0.00000	0.01263	0.00006	0.00003	0.00189	0.00002	0.17270
	0.00000	0.34534	0.00000	0.00000	0.73890	1.64342							
50.000	1.17078	0.63962	0.46731	1.45140	0.00000	0.08662	0.00000	0.01455	0.00004	0.00003	0.00335	0.00001	0.17271
	0.00000	0.34534	0.00000	0.00000	0.69369	1.64342							
40.000	1.13618	0.61961	0.54194	1.45032	0.00000	0.11210	0.00000	0.01673	0.00002	0.00003	0.00629	0.00000	0.17271
	0.00000	0.34534	0.00000	0.00000	0.63612	1.64342							
30.000	1.08664	0.60111	0.62851	1.44926	0.00000	0.14654	0.00000	0.01884	0.00001	0.00002	0.01226	0.00000	0.17271
	0.00000	0.34534	0.00000	0.00000	0.56209	1.64342							
20.000	1.00459	0.58730	0.73819	1.44830	0.00000	0.19537	0.00000	0.02077	0.00000	0.00001	0.02742	0.00000	0.17271
	0.00000	0.34535	0.00000	0.00000	0.45105	1.64342							
10.000	0.86151	0.59527	0.86534	1.44867	0.00000	0.25856	0.00000	0.02002	0.00000	0.00000	0.06792	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.27547	1.64342							
8.000	0.81960	0.60326	0.89128	1.44915	0.00000	0.27244	0.00000	0.01906	0.00000	0.00000	0.08266	0.00000	0.17272
	0.00000	0.34536	0.00000	0.00000	0.22682	1.64342							
6.000	0.77104	0.61612	0.91411	1.44989	0.00000	0.28626	0.00000	0.01759	0.00000	0.00000	0.10114	0.00000	0.17272
	0.00000	0.34536	0.00000	0.00000	0.17261	1.64342							
5.000	0.74409	0.62566	0.92200	1.45039	0.00000	0.29285	0.00000	0.01659	0.00000	0.00000	0.11207	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.14427	1.64342							
4.000	0.71470	0.63799	0.92673	1.45101	0.00000	0.29945	0.00000	0.01536	0.00000	0.00000	0.12438	0.00000	0.17273
	0.00000	0.34537	0.00000	0.00000	0.11488	1.64342							
3.000	0.68247	0.65464	0.92566	1.45178	0.00000	0.30615	0.00000	0.01382	0.00000	0.00000	0.13830	0.00000	0.17273
	0.00000	0.34538	0.00000	0.00000	0.08540	1.64342							
2.000	0.64771	0.68023	0.90924	1.45277	0.00000	0.31248	0.00000	0.01184	0.00000	0.00000	0.15399	0.00000	0.17274
	0.00000	0.34538	0.00000	0.00000	0.06053	1.64342							
1.000	0.61030	0.72666	0.85379	1.45416	0.00000	0.31903	0.00000	0.00905	0.00000	0.00000	0.17151	0.00000	0.17275
	0.00000	0.34539	0.00000	0.00000	0.05205	1.64342							
0.800	0.60254	0.74126	0.83237	1.45454	0.00000	0.32102	0.00000	0.00830	0.00000	0.00000	0.17496	0.00000	0.17275
	0.00000	0.34539	0.00000	0.00000	0.05540	1.64342							
0.600	0.59595	0.76101	0.79947	1.45498	0.00000	0.32289	0.00000	0.00742	0.00000	0.00000	0.17797	0.00000	0.17275
	0.00000	0.34541	0.00000	0.00000	0.06555	1.64342							
0.500	0.59433	0.77513	0.77284	1.45524	0.00000	0.32294	0.00000	0.00690	0.00000	0.00000	0.17915	0.00000	0.17276
	0.00000	0.34541	0.00000	0.00000	0.07687	1.64342							
0.400	0.59308	0.79116	0.74203	1.45553	0.00000	0.32376	0.00000	0.00632	0.00000	0.00000	0.17980	0.00000	0.17276
	0.00000	0.34541	0.00000	0.00000	0.09099	1.64342							
0.300	0.59385	0.81201	0.69957	1.45588	0.00000	0.32456	0.00000	0.00563	0.00000	0.00000	0.17953	0.00000	0.17276
	0.00000	0.34542	0.00000	0.00000	0.11288	1.64342							
0.200	0.59883	0.84149	0.63564	1.45631	0.00000	0.32509	0.00000	0.00477	0.00000	0.00000	0.17741	0.00000	0.17277
	0.00000	0.34544	0.00000	0.00000	0.14948	1.64342							
0.100	0.61501	0.89086	0.52072	1.45691	0.00000	0.32375	0.00000	0.00356	0.00000	0.00000	0.17089	0.00000	0.17279
	0.00000	0.34546	0.00000	0.00000	0.22154	1.64342							
0.080	0.62145	0.90587	0.48427	1.45707	0.00000	0.32277	0.00000	0.00324	0.00000	0.00000	0.16840	0.00000	0.17279
	0.00000	0.34547	0.00000	0.00000	0.24545	1.64342							
0.060	0.63048	0.92464	0.43769	1.45726	0.00000	0.32078	0.00000	0.00286	0.00000	0.00000	0.16515	0.00000	0.17279
	0.00000	0.34549	0.00000	0.00000	0.27654	1.64342							
0.050	0.63662	0.93616	0.40850	1.45737	0.00000	0.31901	0.00000	0.00265	0.00000	0.00000	0.16313	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.29620	1.64342							
0.040	0.64433	0.94955	0.37403	1.45749	0.00000	0.31656	0.00000	0.00240	0.00000	0.00000	0.16068	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.31973	1.64342							
0.030	0.65473	0.96580	0.33114	1.45763	0.00000	0.31258	0.00000	0.00212	0.00000	0.00000	0.15768	0.00000	0.17281
	0.00000	0.34550	0.00000	0.00000	0.34938	1.64342							
0.020	0.67043	0.98650	0.27403	1.45780	0.00000	0.30520	0.00000	0.00178	0.00000	0.00000	0.15377	0.00000	0.17282
	0.00000	0.34550	0.00000	0.00000	0.38968	1.64342							
0.010	0.70045	1.01497	0.18709	1.45804	0.00000	0.28686	0.00000	0.00132	0.00000	0.00000	0.14827	0.00000	0.17283
	0.00000	0.34554	0.00000	0.00000	0.45367	1.64342							
0.008	0.71086	1.02187	0.16290	1.45810	0.00000	0.27964	0.00000	0.00119	0.00000	0.00000	0.14677	0.00000	0.17284
	0.00000	0.34554	0.00000	0.00000	0.47249	1.64342							
0.006	0.72524	1.02911	0.13404	1.45817	0.00000	0.26884	0.00000	0.00105	0.00000	0.00000	0.14508	0.00000	0.17285
	0.00000	0.34555	0.00000	0.00000	0.49580	1.64342							
0.005	0.73494	1.03266	0.11722	1.45821	0.00000	0.26113	0.00000	0.00097	0.00000	0.00000	0.14414	0.00000	0.17284
	0.00000	0.34555	0.00000	0.00000	0.50999	1.64342							
0.004	0.74729	1.03584	0.09853	1.45826	0.00000	0.25103	0.00000	0.00088	0.00000	0.00000	0.14309	0.00000	0.17285
	0.00000	0.34555	0.00000	0.00000	0.52658	1.64342							
0.003	0.76422	1.03804	0.07721	1.45831	0.00000	0.23666	0.00000	0.00077	0.00000	0.00000	0.14188	0.00000	0.17286
	0.00000	0.34557	0.00000	0.00000	0.54689	1.64342							
0.002	0.79006	1.03746	0.05253	1.45838	0.00000	0.21402	0.00000	0.00064	0.00000	0.00000	0.14038	0.00000	0.17287
	0.00000	0.34560	0.00000	0.00000	0.57365	1.64342							
300.000	1.28143	0.79780	0.03569	1.45625	0.00000	0.00194	0.00010	0.00140	0.00100	0.00002	0.00000	0.00346	0.17269
	0.00000	0.34533	0.00000	0.00001	0.97048	1.64342							
400.000	1.28177	0.79641	0.02804	1.45232	0.00000	0.00125	0.00052	0.00123	0.00222	0.00002	0.00000	0.01149	0.17268
	0.00000	0.34533	0.00000	0.00001	0.97952	1.64342							
500.000	1.28088	0.78760	0.02620	1.44420	0.00000	0.00103	0.00165	0.00133	0.00413	0.00003	0.00000	0.02764	0.17267
	0.00000	0.34532	0.00000	0.00002	0.99017	1.64342							

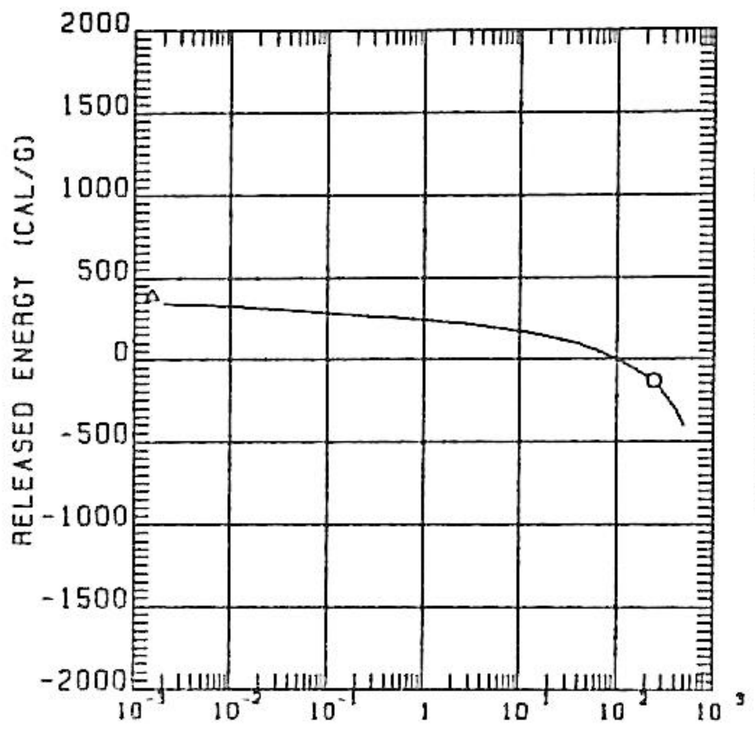
PRESS ;KBAR, PRODUCTS ;MOLES

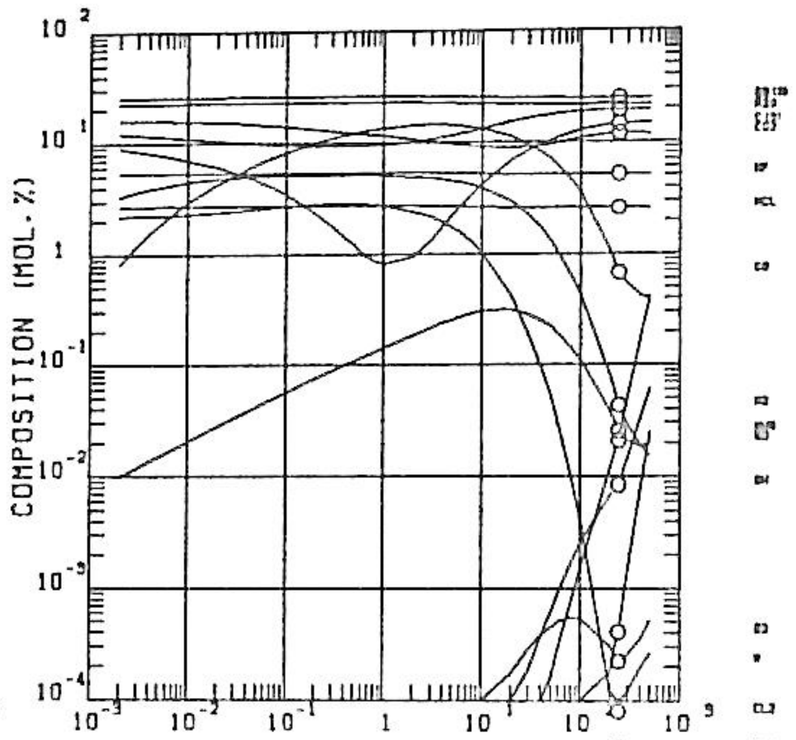
K-H-T ISENTROPE THRU C-J POINT











RDX/EXON/PB 60/10/30VOL

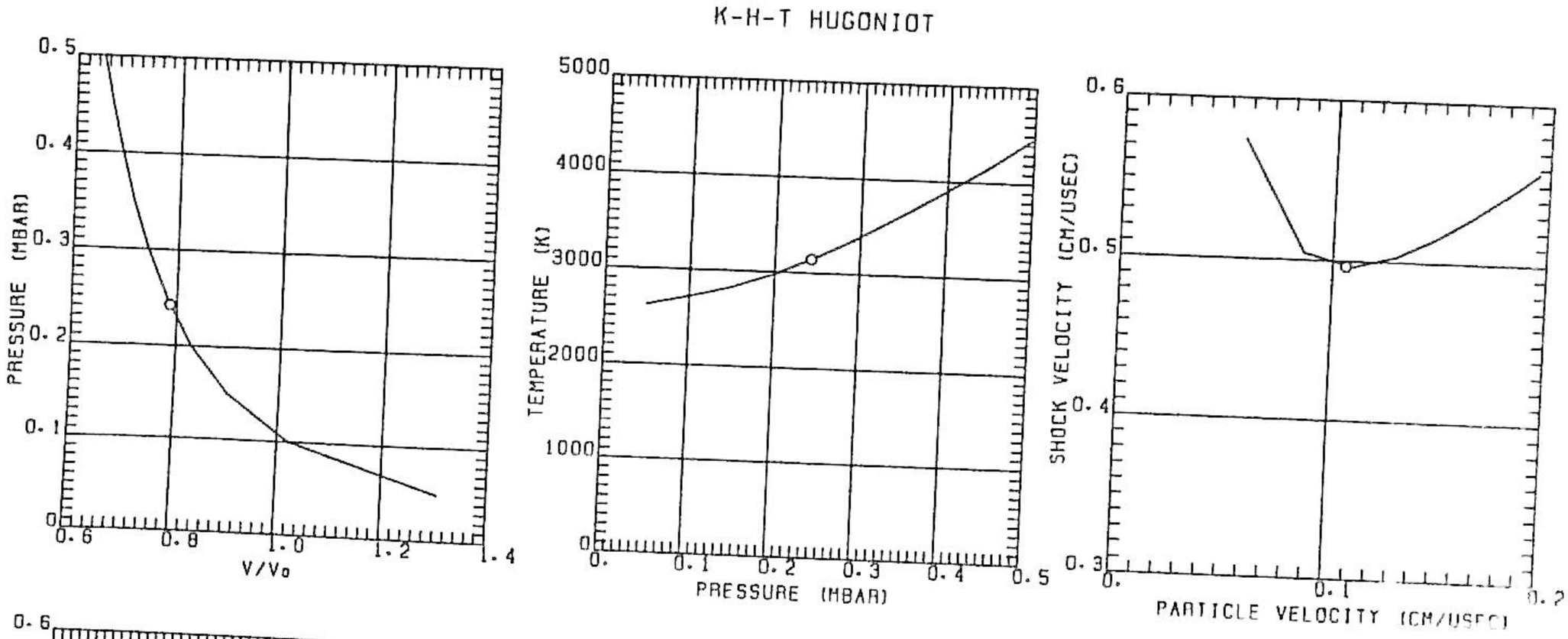
RHO (G/CC)	4.600
E_0 (KCAL/MOLE)	3.04
D_{C-J}(M/SEC)	4966.
P_{C-J}(KBAR)	242.8
T_{C-J}(K)	3142.

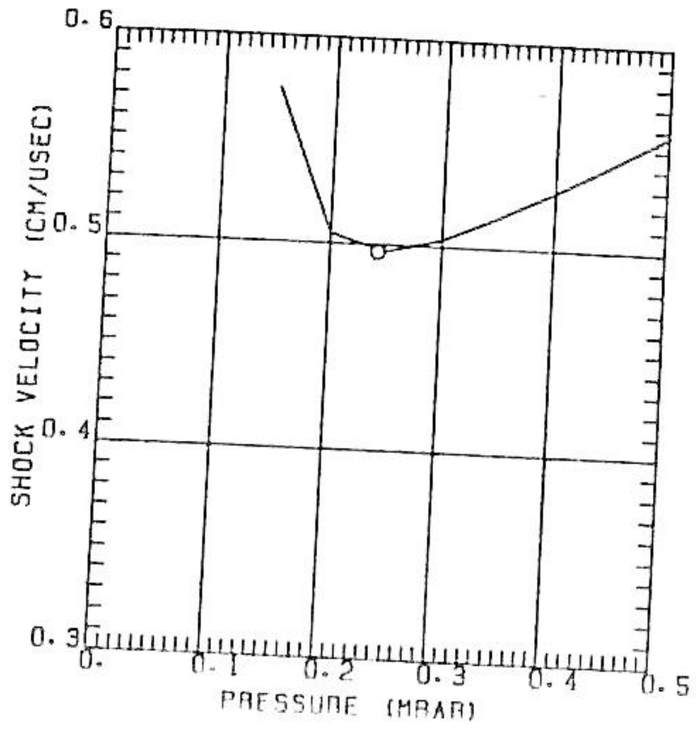
DATE 82-11-01

********** A K-H-T H U G O N I O T <<DATE 82-11-01>>**********

RDX/EXON/PB 60/10/30VOL RHO = 4.6000 G/CC, EO = 3.039523E+03 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.1413	0.1452	0.1497	0.1550	0.1614	0.1695	0.1803	0.1959	0.2222	0.2839
TEMP (DEG K)	4464.3	4174.8	3898.9	3637.1	3392.7	3171.1	2979.6	2825.5	2715.1	2619.5
US (M/SEC)	5572.1	5427.6	5284.7	5148.7	5032.1	4966.1	5047.2	5746.4	0.0	0.0
UP (M/SEC)	1950.7	1802.4	1645.4	1477.8	1296.0	1094.4	861.4	567.5	0.0	0.0
H2O (MOLE)	1.2772	1.2792	1.2804	1.2811	1.2812	1.2805	1.2782	1.2718	1.2483	1.1176
CO2 (MOLE)	0.7718	0.7831	0.7907	0.7951	0.7968	0.7954	0.7895	0.7734	0.7253	0.5653
CO (MOLE)	0.0431	0.0387	0.0364	0.0359	0.0378	0.0438	0.0592	0.0984	0.2183	0.6692
N2 (MOLE)	1.4372	1.4450	1.4506	1.4541	1.4561	1.4571	1.4573	1.4569	1.4551	1.4490
CF4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2 (MOLE)	0.0019	0.0017	0.0017	0.0018	0.0021	0.0027	0.0043	0.0089	0.0266	0.1280
O2 (MOLE)	0.0027	0.0015	0.0007	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0021	0.0018	0.0016	0.0015	0.0015	0.0016	0.0021	0.0034	0.0070	0.0193
OH (MOLE)	0.0073	0.0048	0.0031	0.0019	0.0011	0.0006	0.0004	0.0002	0.0001	0.0001
H (MOLE)	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0057
NO (MOLE)	0.0408	0.0256	0.0146	0.0077	0.0036	0.0016	0.0006	0.0002	0.0001	0.0000
HCL (MOLE)	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727
CCL4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF (MOLE)	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453	0.3453
F2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	0.9891	0.9822	0.9768	0.9729	0.9694	0.9647	0.9553	0.9322	0.8602	0.5639
PB(S) (MOLE)	1.6434	1.6434	1.6434	1.6434	1.6434	1.6434	1.6434	1.6434	1.6434	1.6434





RDX/EXON/PB 60/10/30VOL
RHO (G/CC) 4.600
E_0 (KCAL/MOLE) 3.04

DATE 82-11-01

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 83-03-08>> **********

EXPLOSIVES	#EMULSION OB -5	#EMULSION OB -3	#EMULSION OB -1	#EMULSION OB 0	#EMULSION OB +1	#EMULSION OB +3	#EMULSION OB +5	#
RHO (G/CC)	1.100	1.100	1.100	1.100	1.100	1.100	1.100	
EO (KCAL/MOLE)	-132.48	-132.94	-133.44	-133.72	-133.93	-134.45	-134.92	
MOL.WEIGHT (G)	100.000	100.000	100.000	100.020	100.000	100.000	100.000	
N	1.9168	1.9299	1.9429	1.9500	1.9560	1.9688	1.9819	
H	5.8641	5.8172	5.7694	5.7472	5.7225	5.6758	5.6289	
O	3.6870	3.7077	3.7289	3.7405	3.7500	3.7715	3.7922	
NA	0.0528	0.0532	0.0537	0.0538	0.0540	0.0544	0.0547	
C	0.4691	0.4295	0.3892	0.3689	0.3491	0.3088	0.2692	
SI	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	
DETN.VEL (M/SEC)	5847.3	5842.1	5833.9	5825.5	5782.0	5694.3	5605.0	
PARTICL.VEL(")	1471.3	1471.2	1472.1	1479.9	1467.3	1436.2	1403.2	
C-J PRESS (KBAR)	94.6	94.5	94.5	94.8	93.3	90.0	86.5	
C-J VOLUME (CC/G)	0.68035	0.68015	0.67970	0.67814	0.67839	0.67981	0.68151	
C-J TEMP (DEG K)	2045.5	2082.1	2133.8	2164.1	2100.6	1972.8	1847.2	
C-J S(CAL/DEG MOL)	46.71	46.76	46.93	47.05	46.78	46.15	45.47	
C-J ENERGY (CAL/G)	258.69	258.66	258.97	261.66	257.27	246.58	235.22	
GAMMA	2.974	2.971	2.963	2.936	2.940	2.965	2.995	
C-J DETN.HEAT(CAL)	772.2	781.8	797.1	805.6	777.0	720.3	665.2	
LAMDA	7.6624	7.6332	7.6310	7.6464	7.6336	7.6078	7.5830	
VOLUM(K LITTRE/KG)	1.0441	1.0424	1.0368	1.0319	1.0325	1.0338	1.0351	
TOTAL PRODCT(MOLE)	4.3442	4.3375	4.3146	4.2957	4.2973	4.3028	4.3081	
V GAS (MOLES)	4.2678	4.2609	4.2379	4.2188	4.2204	4.2257	4.2308	
V GAS (CC/MOLE)	15.5323	15.5510	15.6225	15.6586	15.6551	15.6675	15.6876	
V SIO2(S) (CC/G)	0.41931	0.42070	0.42262	0.42335	0.42257	0.42131	0.42017	
V NA2O(S) (CC/G)	0.29782	0.29791	0.29799	0.29761	0.29916	0.30261	0.30614	
H2O (MOL %)	63.5340	64.7051	66.1652	66.8924	66.5790	65.9528	65.3296	
CO2 (MOL %)	8.1508	8.0993	8.3069	8.5845	8.1233	7.1770	6.2494	
CO (MOL %)	2.1321	1.6641	0.7114	0.0027	0.0002	0.0000	0.0000	
N2 (MOL %)	21.5219	21.9009	22.4310	22.6845	22.6873	22.7872	22.9200	
H2 (MOL %)	1.3079	1.0352	0.4356	0.0016	0.0002	0.0000	0.0000	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0159	0.6690	2.1026	3.5385	
NH3 (MOL %)	1.0800	0.6921	0.1678	0.0000	0.0000	0.0000	0.0000	
CH4 (MOL %)	0.5159	0.1392	0.0028	0.0000	0.0000	0.0000	0.0000	
NO (MOL %)	0.0000	0.0000	0.0001	0.0252	0.1415	0.1819	0.1646	
H (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
OH (MOL %)	0.0001	0.0001	0.0002	0.0048	0.0092	0.0066	0.0037	
SIO2(S) (MOL %)	1.1493	1.1511	1.1573	1.1625	1.1618	1.1604	1.1592	
NA2O(S) (MOL %)	0.6080	0.6130	0.6217	0.6258	0.6283	0.6316	0.6350	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 83-03-08>> **********

EMULSION OB 0 RHO = 1.1000 G/CC EO = -1.337191E+05 CAL/MOLE

LN P = -3.41298008 E+00 -2.59560204 E+00LN V 3.80795836 E-01LN V*2 -1.21724531 E-02LN V*3 -8.67278501 E-03LN V*4

LN T = 7.53557968 E+00 -2.94725478 E-01LN V 2.10015595 E-01LN V*2 -2.66768336 E-01LN V*3 9.17385221 E-02LN V*4

LN E = -1.26810169 E+00 7.01986015 E-01LN P 1.77902699 E-01LN P*2 2.24951692 E-02LN P*3 1.09137758 E-03LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
200.000 (198.102)	0.5316	2724.2 (2664.2)	-778.1	0.13256 (0.13219)	3.0827	238.4
100.000 (100.774)	0.6661	2192.1 (2231.4)	-289.7	0.11212 (0.11245)	2.9088	1401.0
100.000 (100.771)	0.6661	2192.1 (2231.4)	-289.6	0.11212 (0.11245)	2.9087	1401.1
* 94.835 (95.666)	0.6781	2164.1 (2207.1)	-261.7	0.11095 (0.11136)	2.8949	1479.9
80.000 (80.240)	0.7210	2118.6 (2132.1)	-194.0	0.10812 (0.10815)	2.8475	1736.8
60.000 (59.776)	0.8007	2043.5 (2027.6)	-91.7	0.10383 (0.10357)	2.7663	2140.0
50.000 (49.705)	0.8565	1997.6 (1973.0)	-34.2	0.10143 (0.10113)	2.7143	2376.8
40.000 (39.706)	0.9313	1944.9 (1915.5)	28.5	0.09881 (0.09852)	2.6500	2650.0
30.000 (29.815)	1.0394	1880.2 (1852.9)	99.5	0.09584 (0.09565)	2.5662	2976.4
20.000 (19.946)	1.2203	1793.6 (1778.0)	184.2	0.09229 (0.09229)	2.4457	3397.2
10.000 (10.035)	1.6370	1651.5 (1660.4)	299.2	0.08748 (0.08768)	2.2333	4032.2
8.000 (8.033)	1.8114	1606.8 (1619.9)	330.0	0.08619 (0.08637)	2.1633	4218.9
6.000 (6.021)	2.0756	1549.5 (1563.3)	366.7	0.08466 (0.08478)	2.0724	4448.9
5.000 (5.013)	2.2703	1512.9 (1524.7)	388.6	0.08374 (0.08382)	2.0148	4588.9
4.000 (4.002)	2.5439	1468.6 (1474.5)	413.5	0.08270 (0.08269)	1.9446	4755.0
3.000 (2.993)	2.9644	1411.8 (1406.6)	443.6	0.08144 (0.08131)	1.8556	4960.4
2.000 (1.990)	3.7209	1332.9 (1311.8)	482.5	0.07981 (0.07957)	1.7366	5234.4
1.000 (1.002)	5.6464	1199.6 (1205.5)	541.7	0.07734 (0.07745)	1.5666	5664.1

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 83-03-08>> **********

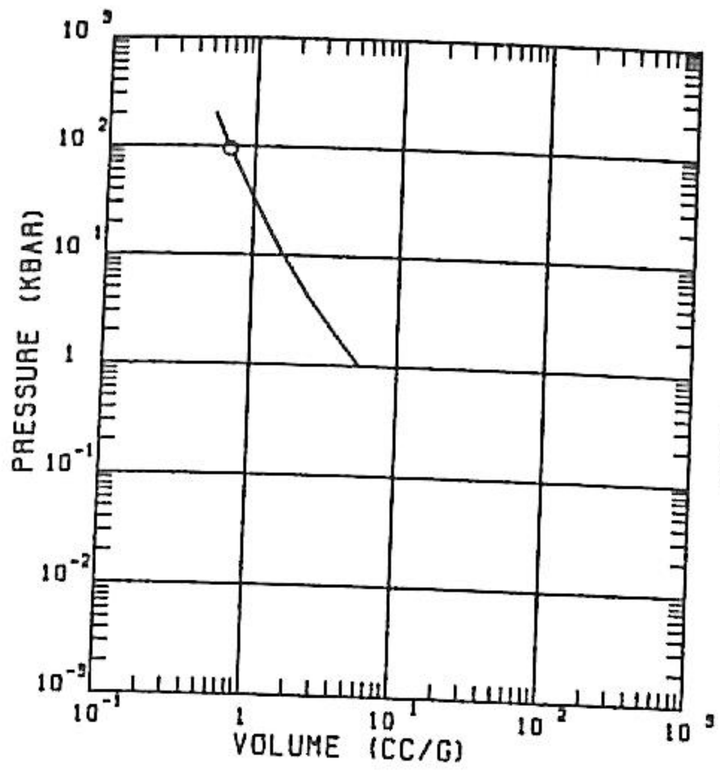
EMULSION OB 0 RHO = 1.1000 G/CC EO = -1.337191E+05 CAL/MOLE

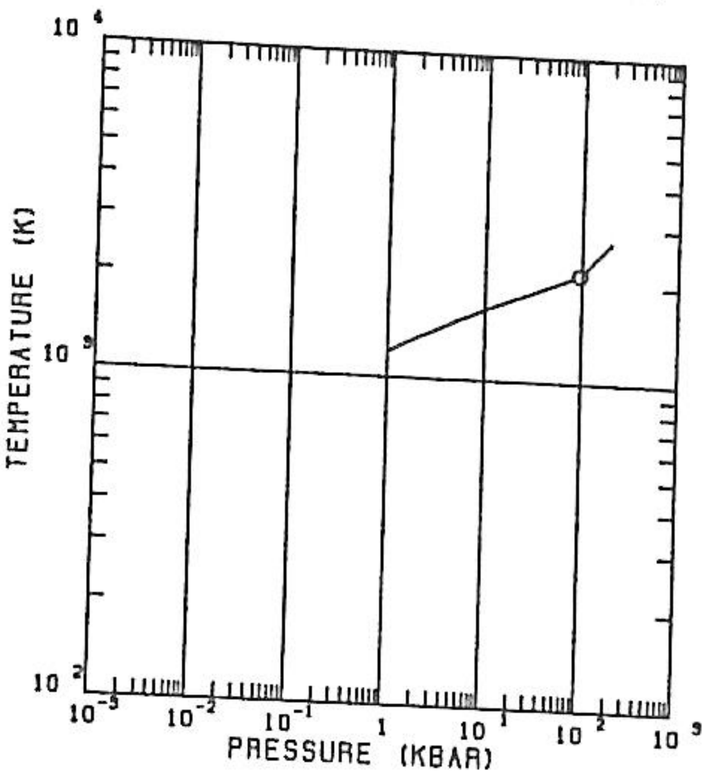
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

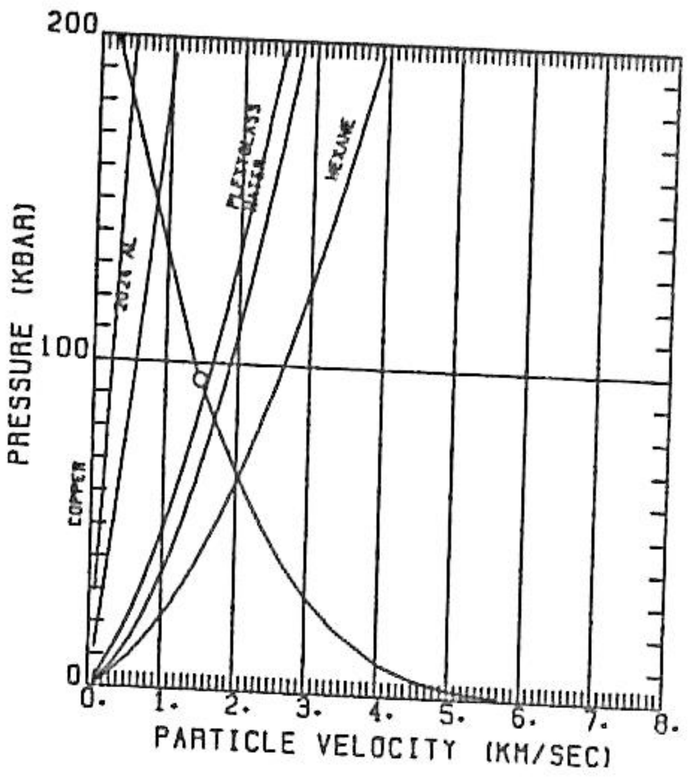
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	CH4	NO	H	OH	SIO2(S)	NA2O(S)
94.835	2.87347	0.36877	0.00012	0.97445	0.00007	0.00069	0.00000	0.00000	0.00109	0.00000	0.00021	0.04993	0.02688
80.000	2.87348	0.36877	0.00010	0.97451	0.00007	0.00072	0.00000	0.00000	0.00097	0.00000	0.00019	0.04994	0.02688
60.000	2.87351	0.36881	0.00007	0.97459	0.00006	0.00080	0.00000	0.00000	0.00081	0.00000	0.00017	0.04994	0.02688
50.000	2.87352	0.36882	0.00006	0.97464	0.00005	0.00083	0.00000	0.00000	0.00071	0.00000	0.00015	0.04994	0.02688
40.000	2.87354	0.36884	0.00005	0.97469	0.00005	0.00087	0.00000	0.00000	0.00061	0.00000	0.00013	0.04993	0.02688
30.000	2.87357	0.36889	0.00003	0.97474	0.00004	0.00092	0.00000	0.00000	0.00050	0.00000	0.00011	0.04991	0.02688
20.000	2.87360	0.36891	0.00002	0.97481	0.00003	0.00095	0.00000	0.00000	0.00037	0.00000	0.00008	0.04992	0.02688
10.000	2.87365	0.36891	0.00001	0.97489	0.00001	0.00103	0.00000	0.00000	0.00022	0.00000	0.00004	0.04991	0.02688
8.000	2.87366	0.36893	0.00000	0.97490	0.00001	0.00106	0.00000	0.00000	0.00018	0.00000	0.00003	0.04988	0.02688
6.000	2.87367	0.36893	0.00000	0.97492	0.00000	0.00110	0.00000	0.00000	0.00014	0.00000	0.00002	0.04988	0.02688
5.000	2.87368	0.36894	0.00000	0.97494	0.00000	0.00107	0.00000	0.00000	0.00012	0.00000	0.00002	0.04990	0.02688
4.000	2.87369	0.36893	0.00000	0.97495	0.00000	0.00110	0.00000	0.00000	0.00008	0.00000	0.00001	0.04988	0.02688
3.000	2.87370	0.36893	0.00000	0.97497	0.00000	0.00112	0.00000	0.00000	0.00006	0.00000	0.00001	0.04988	0.02688
2.000	2.87372	0.36897	0.00000	0.97498	0.00000	0.00108	0.00000	0.00000	0.00004	0.00000	0.00000	0.04988	0.02688
1.000	2.87374	0.36896	0.00000	0.97500	0.00000	0.00110	0.00000	0.00000	0.00000	0.00000	0.00000	0.04988	0.02688
100.000	2.87345	0.36875	0.00014	0.97442	0.00008	0.00066	0.00000	0.00000	0.00114	0.00000	0.00022	0.04994	0.02688
100.000	2.87345	0.36875	0.00013	0.97441	0.00008	0.00067	0.00000	0.00000	0.00115	0.00000	0.00022	0.04992	0.02688
200.000	2.87272	0.36756	0.00133	0.97353	0.00043	0.00048	0.00006.	0.00000	0.00287	0.00000	0.00076	0.04993	0.02688

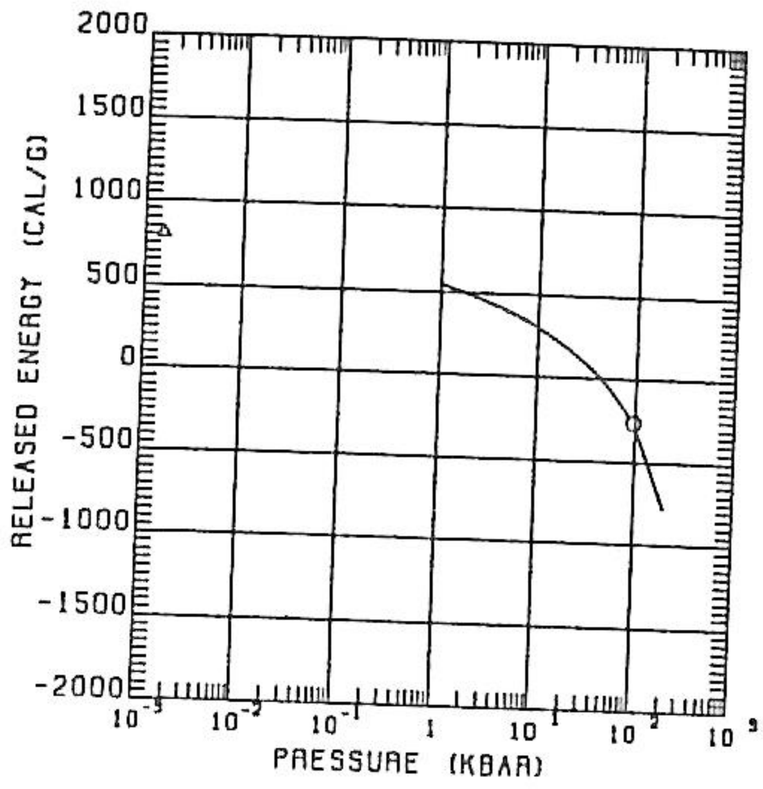
PRESS ;KBAR, PRODUCTS ;MOLES

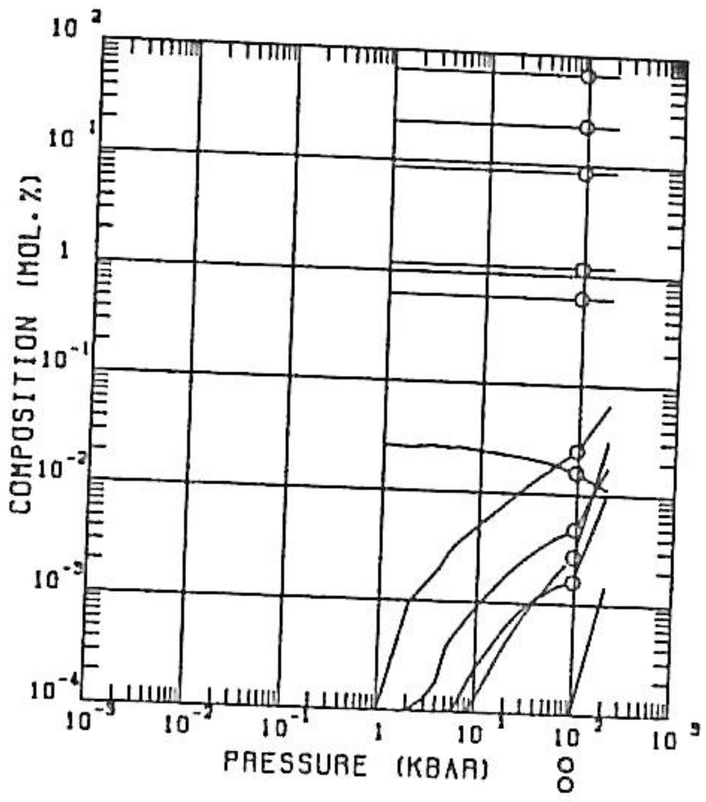
K-H-T ISENTROPE THRU C-J POINT







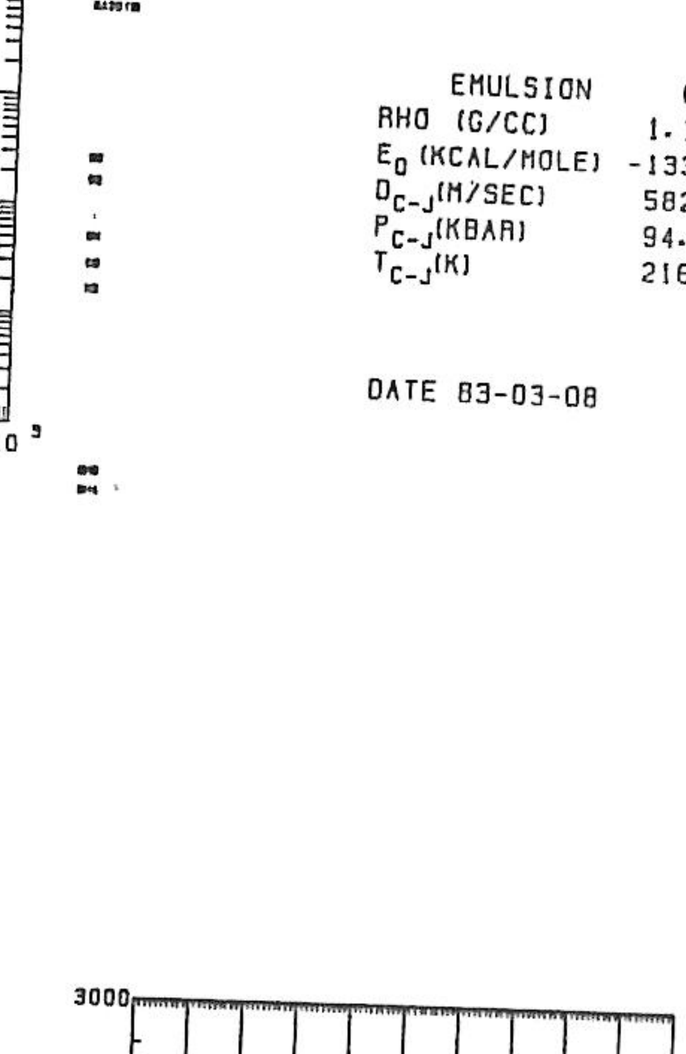




EMULSION	08 0
RHO (G/CC)	1.100
E_0 (KCAL/MOLE)	-133.72
D_{C-J}(M/SEC)	5825.
P_{C-J}(KBAR)	94.8
T_{C-J}(K)	2164.

DATE 83-03-08

K-H-T C-J DETONATION PROPERTIES



○ EMULSION
△ EMULSION 1

DATE 83-03-08

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-30>> **********

EXPLOSIVES	PETN 76 SI RUBBER 24	#XTX8003;PETN#XTX 8004;RDX# 80/SYLGARD	80/SYLGARD
RHO (G/CC)	1.490	1.530	1.500
EO (KCAL/MOLE)	-30.58	-38.90	-0.63
MOL.WEIGHT (G)	100.000	100.000	100.000
C	2.5763	1.8047	1.6199
H	3.8865	3.6426	3.7792
N	0.9616	1.0122	2.1610
O	2.8848	3.3063	2.4307
SI	0.1963	0.2697	0.2697
DETN.VEL (M/SEC)	6909.5	7497.7	7603.8
PARTICL.VEL(")	1751.4	2001.1	1990.7
C-J PRESS (KBAR)	180.3	229.6	227.1
C-J VOLUME (CC/G)	0.50102	0.47916	0.49213
C-J TEMP (DEG K)	3671.2	4199.4	4141.9
C-J S(CAL/DEG MOL)	66.00	65.00	62.87
C-J ENERGY (CAL/G)	366.55	478.53	473.57
GAMMA	2.945	2.747	2.820
C-J DETN.HEAT(CAL)	1468.1	1645.6	1642.7
LAMDA	7.5572	8.0416	7.5796
VOLUM(K LITTRE/KG)	0.6811	0.7115	0.7425
TOTAL PRODCT(MOLE)	5.1822	4.3955	4.7989
V GAS (MOLES)	2.7840	2.9080	3.0348
V GAS (CC/MOLE)	13.3518	12.9482	12.5082
V C(S) (CC/G)	0.31298	0.29165	0.29255
V SIO2(S) (CC/G)	0.39458	0.37002	0.37040
H2O (MOL %)	36.0743	40.1029	35.4859
CO2 (MOL %)	4.7312	9.2199	1.1976
CO (MOL %)	2.4850	4.1273	1.3932
N2 (MOL %)	9.1170	11.3183	21.8417
H2 (MOL %)	0.9301	0.8146	1.8423
O2 (MOL %)	0.0005	0.0050	0.0006
NH3 (MOL %)	0.3001	0.2800	1.2955
OH (MOL %)	0.0462	0.1590	0.0834
H (MOL %)	0.0069	0.0153	0.0215
CH4 (MOL %)	0.0088	0.0058	0.0262
NO (MOL %)	0.0218	0.1117	0.0529
C(S) (MOL %)	42.4897	27.7044	31.1392
SIO2(S) (MOL %)	3.7885	6.1359	5.6202

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

PETN 76 SI RUBBER 24 RHO = 1.4900 G/CC EO = -3.057896E+04 CAL/MOLE

LN P = -3.56727600 E+00 -2.40483856 E+00LN V 3.47337902 E-01LN V*2 -3.94016765 E-02LN V*3 1.57585298 E-03LN V*4

LN T = 7.82904148 E+00 -4.72401023 E-01LN V 1.38516188 E-01LN V*2 -2.19423324 E-02LN V*3 1.25230430 E-03LN V*4

LN E = -1.56167507 E+00 4.36944962 E-01LNP 6.72356486 E-02LN P*2 5.11977449 E-03LN P*3 1.43882062 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (437.341)	0.3740	4740.4 (4673.7)	-1247.6	0.15220 (0.14816)	3.2084	80.8
300.000 (308.259)	0.4178	4254.1 (4281.9)	-844.2	0.13532 (0.13548)	3.1053	753.4
200.000 (198.094)	0.4832	3772.4 (3845.5)	-447.4	0.11872 (0.12110)	2.9750	1564.2
* 180.309 (178.045)	0.5010	3671.2 (3749.1)	-366.7	0.11534 (0.11796)	2.9436	1751.4
100.000 (95.928)	0.6223	3295.6 (3250.9)	-71.5	0.10299 (0.10334)	2.7616	2741.2
80.000 (76.642)	0.6757	3145.2 (3093.0)	24.7	0.09896 (0.09896)	2.6957	3061.6
60.000 (57.584)	0.7525	2952.9 (2907.6)	136.9	0.09427 (0.09406)	2.6121	3443.6
50.000 (48.148)	0.8064	2834.9 (2799.8)	201.3	0.09158 (0.09133)	2.5598	3669.1
40.000 (38.695)	0.8793	2697.6 (2676.2)	272.7	0.08859 (0.08832)	2.4962	3931.1
30.000 (29.223)	0.9858	2536.5 (2529.6)	352.4	0.08525 (0.08491)	2.4148	4248.2
20.000 (19.836)	1.1618	2330.4 (2347.8)	450.5	0.08115 (0.08087)	2.3033	4653.1
10.000 (10.175)	1.5722	2051.4 (2083.2)	580.5	0.07571 (0.07553)	2.1141	5275.6
8.000 (8.169)	1.7469	1980.7 (2008.1)	612.5	0.07437 (0.07412)	2.0530	5462.5
6.000 (6.167)	2.0087	1895.1 (1919.4)	653.0	0.07268 (0.07249)	1.9757	5691.0
5.000 (5.143)	2.2045	1847.9 (1866.5)	674.8	0.07177 (0.07155)	1.9264	5832.4
4.000 (4.116)	2.4791	1793.3 (1805.8)	700.7	0.07068 (0.07047)	1.8669	6000.1
3.000 (3.088)	2.9013	1727.4 (1733.9)	733.1	0.06933 (0.06920)	1.7914	6208.0
2.000 (2.050)	3.6722	1646.3 (1642.9)	773.3	0.06764 (0.06757)	1.6874	6489.3
1.000 (1.014)	5.6999	1527.6 (1513.6)	834.5	0.06508 (0.06511)	1.5206	6940.3
0.800 (0.808)	6.6345	1493.3 (1478.1)	852.9	0.06432 (0.06438)	1.4709	7078.8
0.600 (0.603)	8.1325	1451.1 (1435.9)	876.1	0.06335 (0.06346)	1.4101	7253.7
0.500 (0.500)	9.2949	1425.2 (1411.1)	890.6	0.06274 (0.06289)	1.3738	7362.5
0.400 (0.398)	11.0006	1394.6 (1382.4)	908.0	0.06201 (0.06220)	1.3318	7494.2
0.300 (0.297)	13.7936	1357.6 (1347.6)	928.8	0.06114 (0.06132)	1.2820	7662.4
0.200 (0.196)	19.1923	1306.6 (1302.4)	958.9	0.05988 (0.06009)	1.2217	7893.6
0.100 (0.098)	34.6114	1225.5 (1230.8)	1008.5	0.05780 (0.05801)	1.1470	8275.8
0.080 (0.078)	42.0375	1201.0 (1208.4)	1023.7	0.05717 (0.05734)	1.1305	8395.7
0.060 (0.059)	54.1052	1170.4 (1179.5)	1043.0	0.05636 (0.05648)	1.1145	8547.9
0.050 (0.049)	63.5379	1151.6 (1161.2)	1055.1	0.05586 (0.05594)	1.1071	8643.2
0.040 (0.040)	77.4133	1129.2 (1138.6)	1069.4	0.05526 (0.05529)	1.1009	8758.8
0.030 (0.030)	99.9512	1101.3 (1109.3)	1087.4	0.05450 (0.05446)	1.0970	8906.4
0.020 (0.020)	143.4435	1063.5 (1067.9)	1112.0	0.05347 (0.05333)	1.0982	9111.7
0.010 (0.010)	266.4673	1002.8 (999.4)	1152.1	0.05179 (0.05155)	1.1141	9456.5
0.008 (0.008)	325.4656	984.3 (978.7)	1164.3	0.05129 (0.05103)	1.1217	9565.9
0.006 (0.006)	421.2187	961.0 (953.8)	1179.6	0.05064 (0.05041)	1.1325	9705.7
0.005 (0.005)	495.8965	946.3 (939.3)	1189.3	0.05024 (0.05006)	1.1396	9793.3
0.004 (0.004)	605.7820	928.9 (923.1)	1200.7	0.04976 (0.04967)	1.1485	9899.8
0.003 (0.003)	784.1677	907.0 (905.4)	1215.0	0.04916 (0.04924)	1.1595	10035.3
0.002 (0.002)	1128.0833	876.8 (888.0)	1234.6	0.04834 (0.04880)	1.1730	10222.5

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

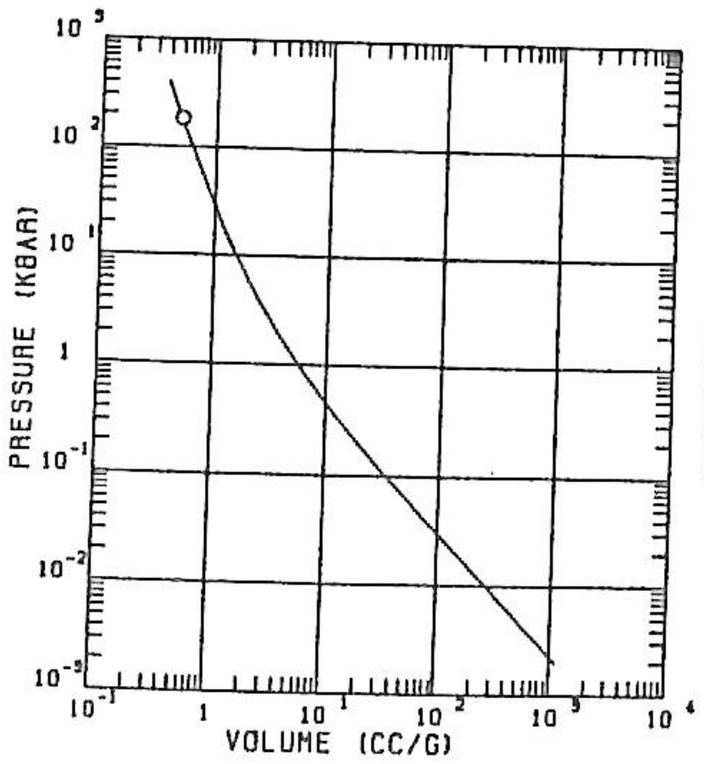
PETN 76 SI RUBBER 24 RHO = 1.4900 G/CC EO = -3.057896E+04 CAL/MOLE

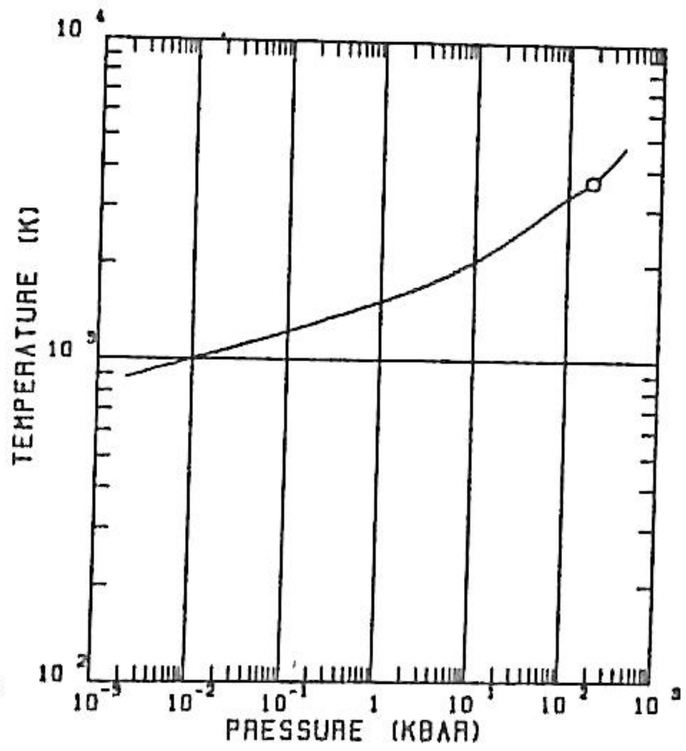
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

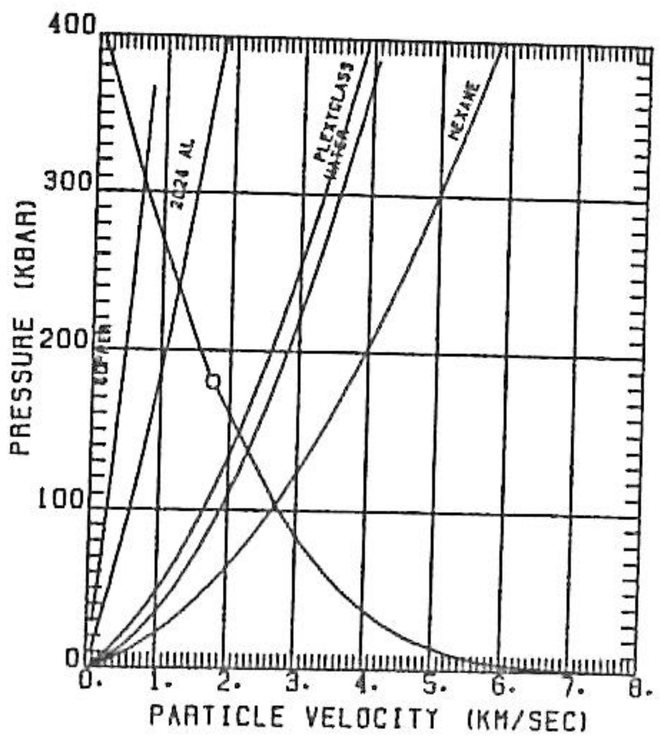
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	SIO2(S)
180.309	1.86961	0.24521	0.12852	0.47248	0.04808	0.00003	0.01552	0.00240	0.00036	0.00045	0.00113	2.20213	0.19633
100.000	1.74010	0.23083	0.28925	0.46524	0.14572	0.00000	0.03092	0.00097	0.00044	0.00517	0.00022	2.05105	0.19633
80.000	1.67170	0.22884	0.36212	0.46275	0.19623	0.00000	0.03602	0.00063	0.00040	0.01039	0.00011	1.97497	0.19633
60.000	1.57136	0.22982	0.46082	0.46037	0.26615	0.00000	0.04082	0.00033	0.00033	0.02209	0.00004	1.86359	0.19633
50.000	1.50384	0.23262	0.52289	0.45951	0.30944	0.00000	0.04255	0.00022	0.00027	0.03295	0.00002	1.78786	0.19633
40.000	1.41778	0.23802	0.59827	0.45910	0.35945	0.00000	0.04339	0.00013	0.00020	0.05038	0.00001	1.68964	0.19633
30.000	1.31040	0.24744	0.68687	0.45960	0.41453	0.00000	0.04239	0.00006	0.00014	0.07731	0.00000	1.56468	0.19633
20.000	1.15771	0.26583	0.80280	0.46139	0.47190	0.00000	0.03882	0.00002	0.00007	0.12768	0.00000	1.38002	0.19633
10.000	0.94051	0.30300	0.94568	0.46586	0.51940	0.00000	0.02991	0.00000	0.00002	0.21923	0.00000	1.10838	0.19633
8.000	0.88233	0.31417	0.98151	0.46725	0.52811	0.00000	0.02712	0.00000	0.00002	0.24606	0.00000	1.03456	0.19633
6.000	0.82227	0.33024	1.00948	0.46894	0.53264	0.00000	0.02377	0.00000	0.00001	0.27634	0.00000	0.96024	0.19633
5.000	0.78792	0.33916	1.02599	0.46989	0.53610	0.00000	0.02187	0.00000	0.00001	0.29321	0.00000	0.91795	0.19633
4.000	0.75284	0.35063	1.03814	0.47094	0.53847	0.00000	0.01973	0.00000	0.00001	0.31117	0.00000	0.87638	0.19633
3.000	0.71737	0.36650	1.04191	0.47216	0.53927	0.00000	0.01730	0.00000	0.00000	0.33033	0.00000	0.83756	0.19633
2.000	0.67869	0.38776	1.03806	0.47359	0.54158	0.00000	0.01444	0.00000	0.00000	0.35066	0.00000	0.79984	0.19633
1.000	0.63962	0.42487	1.00290	0.47544	0.54628	0.00000	0.01075	0.00000	0.00000	0.37061	0.00000	0.77792	0.19633
0.800	0.63300	0.43719	0.98483	0.47592	0.54821	0.00000	0.00980	0.00000	0.00000	0.37367	0.00000	0.78061	0.19633
0.600	0.62821	0.45349	0.95705	0.47647	0.55102	0.00000	0.00871	0.00000	0.00000	0.37548	0.00000	0.79027	0.19633
0.500	0.62725	0.46410	0.93675	0.47678	0.55293	0.00000	0.00809	0.00000	0.00000	0.37547	0.00000	0.79997	0.19633
0.400	0.62788	0.47719	0.90997	0.47713	0.55568	0.00000	0.00738	0.00000	0.00000	0.37431	0.00000	0.81482	0.19633
0.300	0.63001	0.49294	0.87633	0.47754	0.56139	0.00000	0.00656	0.00000	0.00000	0.37100	0.00000	0.83600	0.19633
0.200	0.63854	0.51678	0.82011	0.47805	0.56841	0.00000	0.00555	0.00000	0.00000	0.36398	0.00000	0.87543	0.19633
0.100	0.66027	0.55762	0.71671	0.47874	0.58091	0.00000	0.00416	0.00000	0.00000	0.34792	0.00000	0.95409	0.19633
0.080	0.66821	0.57041	0.68320	0.47892	0.58503	0.00000	0.00379	0.00000	0.00000	0.34216	0.00000	0.98050	0.19633
0.060	0.67893	0.58683	0.63963	0.47915	0.58987	0.00000	0.00336	0.00000	0.00000	0.33471	0.00000	1.01512	0.19633
0.050	0.68595	0.59712	0.61203	0.47926	0.59261	0.00000	0.00311	0.00000	0.00000	0.33002	0.00000	1.03712	0.19633
0.040	0.69450	0.60944	0.57886	0.47940	0.59589	0.00000	0.00283	0.00000	0.00000	0.32431	0.00000	1.06369	0.19633
0.030	0.70566	0.62489	0.53680	0.47957	0.59965	0.00000	0.00251	0.00000	0.00000	0.31709	0.00000	1.09749	0.19633
0.020	0.72158	0.64585	0.47896	0.47977	0.60379	0.00000	0.00211	0.00000	0.00000	0.30736	0.00000	1.14415	0.19633
0.010	0.74956	0.67895	0.38478	0.48003	0.60681	0.00000	0.00158	0.00000	0.00000	0.29226	0.00000	1.22029	0.19633
0.008	0.75854	0.68855	0.35661	0.48010	0.60703	0.00000	0.00144	0.00000	0.00000	0.28777	0.00000	1.24338	0.19633
0.006	0.77042	0.70021	0.32142	0.48019	0.60622	0.00000	0.00127	0.00000	0.00000	0.28235	0.00000	1.27232	0.19633
0.005	0.77839	0.70723	0.29940	0.48023	0.60463	0.00000	0.00118	0.00000	0.00000	0.27923	0.00000	1.29041	0.19633
0.004	0.78799	0.71515	0.27396	0.48029	0.60256	0.00000	0.00107	0.00000	0.00000	0.27555	0.00000	1.31165	0.19633
0.003	0.80075	0.72440	0.24272	0.48035	0.59874	0.00000	0.00095	0.00000	0.00000	0.27117	0.00000	1.33800	0.19633
0.002	0.81966	0.73549	0.20164	0.48043	0.59071	0.00000	0.00080	0.00000	0.00000	0.26584	0.00000	1.37332	0.19633
200.000	1.87988	0.24691	0.11381	0.47303	0.04018	0.00004	0.01395	0.00295	0.00037	0.00030	0.00160	2.21529	0.19633
300.000	1.90515	0.25099	0.07145	0.47292	0.02009	0.00030	0.00953	0.00673	0.00042	0.00007	0.00622	2.25380	0.19633
400.000	1.91020	0.24737	0.05569	0.46837	0.01375	0.00118	0.00841	0.01269	0.00053	0.00003	0.01645	2.27321	0.19633

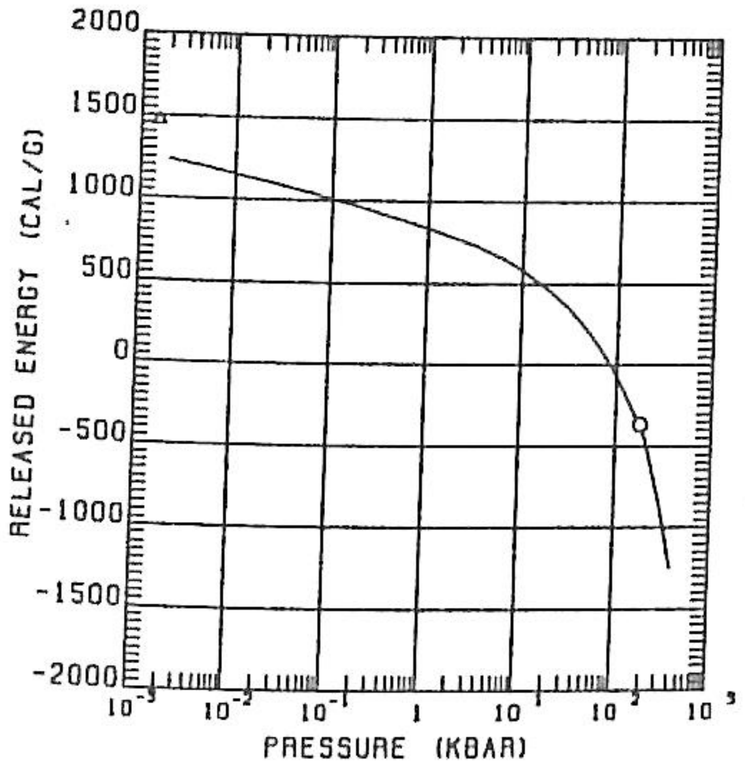
PRESS ;KBAR, PRODUCTS ;MOLES

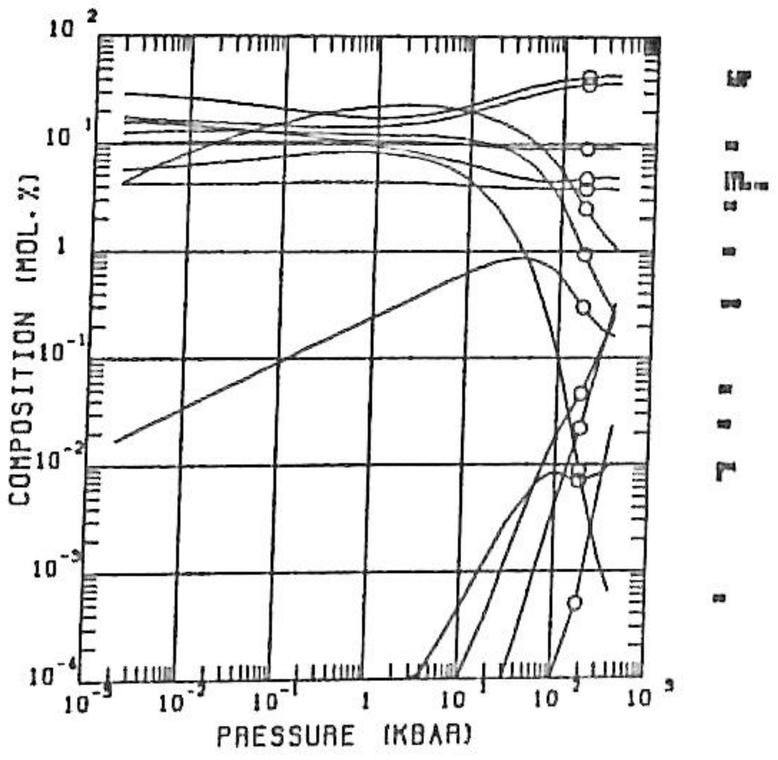
K-H-T ISENTROPE THRU C-J POINT











PETN 76 SI RUBBER 24

RHO (G/CC)	1.490
E_0 (KCAL/MOLE)	-30.58
D_{C-J} (M/SEC)	6909.
P_{C-J} (KBAR)	180.3
T_{C-J} (K)	3671.

DATE 82-11-30

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

XTX8003;PETN 80/SYLGARD RHO = 1.5300 G/CC EO = -3.890400E+04 CAL/MOLE

LN P = -3.42578697 E+00 -2.38396549 E+00LN V 3.13480675 E-01LN V*2 -3.12583670 E-02LN V*3 1.00151892 E-03LN V*4

LN T = 7.90764713 E+00 -4.99477029 E-01LN V 1.43581808 E-01LN V*2 -2.26283781 E-02LN V*3 1.29882945 E-03LN V*4

LN E = -1.52491379 E+00 4.84738648 E-01LNP 7.35352635 E-02LN P*2 5.58338687 E-03LN P*3 1.56383001 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (557.567)	0.3549	5543.1 (5462.8)	-1561.5	0.16534 (0.16083)	3.1385	168.2
400.000 (420.432)	0.3888	5018.4 (5053.5)	-1158.6	0.14848 (0.14786)	3.0634	759.8
300.000 (301.201)	0.4342	4547.6 (4619.7)	-763.2	0.13193 (0.13381)	2.9746	1438.2
* 229.553 (225.466)	0.4792	4199.4 (4282.1)	-478.4	0.12002 (0.12294)	2.8975	2001.1
200.000 (193.258)	0.5056	4097.1 (4115.8)	-384.4	0.11608 (0.11803)	2.8565	2292.4
100.000 (93.615)	0.6575	3532.2 (3442.9)	25.4	0.09894 (0.09877)	2.6637	3508.5
80.000 (74.896)	0.7156	3350.4 (3267.4)	133.6	0.09441 (0.09407)	2.6044	3837.9
60.000 (56.448)	0.7989	3123.2 (3063.4)	258.6	0.08918 (0.08882)	2.5295	4229.3
50.000 (47.278)	0.8575	2987.1 (2945.2)	329.2	0.08623 (0.08589)	2.4826	4460.9
40.000 (38.111)	0.9362	2830.3 (2810.8)	407.2	0.08296 (0.08268)	2.4257	4729.2
30.000 (29.464)	1.0426	2649.5 (2662.7)	494.3	0.07932 (0.07906)	2.3580	5032.0
20.000 (20.041)	1.2321	2418.8 (2463.8)	601.2	0.07485 (0.07476)	2.2572	5453.0
10.000 (10.297)	1.6747	2115.4 (2176.0)	737.8	0.06913 (0.06907)	2.0851	6102.3
8.000 (8.299)	1.8598	2036.0 (2096.0)	774.0	0.06761 (0.06757)	2.0301	6294.3
6.000 (6.270)	2.1405	1964.2 (2000.5)	813.3	0.06597 (0.06583)	1.9594	6532.4
5.000 (5.238)	2.3489	1920.3 (1943.8)	836.8	0.06499 (0.06482)	1.9145	6679.0
4.000 (4.186)	2.6452	1870.1 (1878.0)	863.1	0.06389 (0.06367)	1.8591	6855.3
3.000 (3.133)	3.1007	1805.0 (1800.2)	896.8	0.06248 (0.06230)	1.7888	7073.7
2.000 (2.072)	3.9332	1720.1 (1701.7)	940.0	0.06067 (0.06056)	1.6909	7369.4
1.000 (1.016)	6.1231	1588.7 (1561.5)	1006.1	0.05791 (0.05791)	1.5320	7842.4
0.800 (0.807)	7.1336	1549.7 (1522.8)	1025.6	0.05709 (0.05713)	1.4837	7987.5
0.600 (0.600)	8.7486	1500.8 (1476.8)	1050.3	0.05606 (0.05614)	1.4244	8169.9
0.500 (0.497)	10.0014	1470.9 (1449.6)	1065.4	0.05542 (0.05553)	1.3886	8283.3
0.400 (0.395)	11.8335	1435.2 (1418.2)	1083.6	0.05466 (0.05479)	1.3469	8419.8
0.300 (0.294)	14.8001	1390.7 (1380.3)	1106.6	0.05370 (0.05386)	1.2971	8592.4
0.200 (0.195)	20.4871	1329.7 (1330.8)	1139.2	0.05233 (0.05256)	1.2355	8828.3
0.100 (0.097)	36.6627	1237.8 (1252.1)	1191.2	0.05016 (0.05036)	1.1551	9218.0
0.080 (0.078)	44.4551	1212.4 (1227.4)	1207.7	0.04947 (0.04966)	1.1363	9340.3
0.060 (0.059)	57.2027	1181.7 (1195.7)	1227.2	0.04865 (0.04877)	1.1170	9496.6
0.050 (0.049)	67.1330	1162.5 (1175.7)	1239.8	0.04813 (0.04821)	1.1078	9594.1
0.040 (0.040)	81.7276	1139.7 (1151.2)	1254.8	0.04750 (0.04753)	1.0995	9712.2
0.030 (0.030)	105.4183	1111.4 (1119.8)	1273.7	0.04671 (0.04667)	1.0933	9862.8
0.020 (0.020)	151.0944	1073.1 (1076.0)	1299.4	0.04563 (0.04550)	1.0930	10072.4
0.010 (0.010)	280.1138	1011.7 (1005.2)	1341.3	0.04388 (0.04365)	1.1119	10424.9
0.008 (0.008)	341.9631	993.0 (984.3)	1354.0	0.04335 (0.04311)	1.1225	10537.2
0.006 (0.006)	441.7114	968.9 (959.6)	1370.9	0.04264 (0.04246)	1.1389	10680.1
0.005 (0.005)	520.4370	954.8 (945.3)	1380.1	0.04226 (0.04208)	1.1509	10770.9
0.004 (0.004)	635.4944	937.3 (929.8)	1392.0	0.04176 (0.04165)	1.1667	10880.7
0.003 (0.003)	821.0510	914.5 (913.6)	1407.8	0.04110 (0.04118)	1.1890	11019.9
0.002 (0.002)	1180.1343	884.1 (899.3)	1428.2	0.04024 (0.04065)	1.2233	11213.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

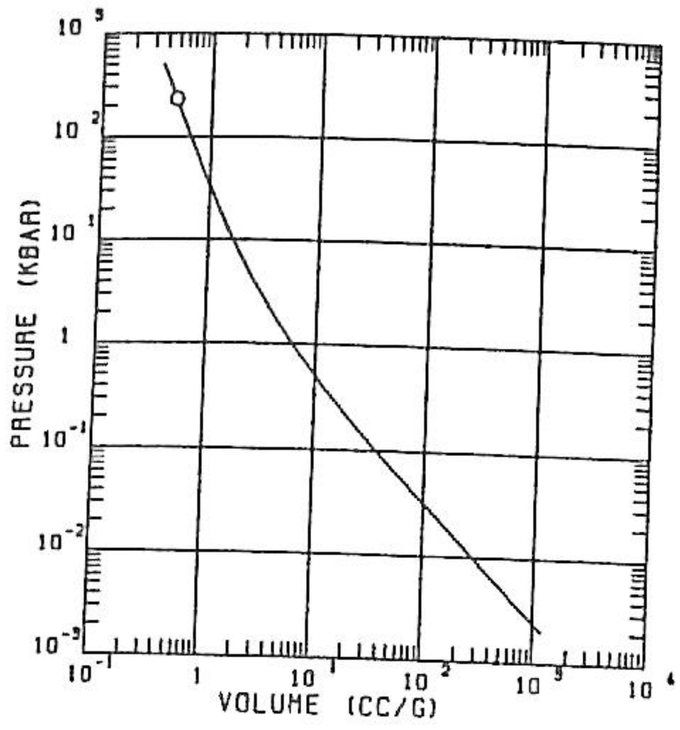
XTX8003;PETN 80/SYLGARD RHO = 1.5300 G/CC EO = -3.890400E+04 CAL/MOLE

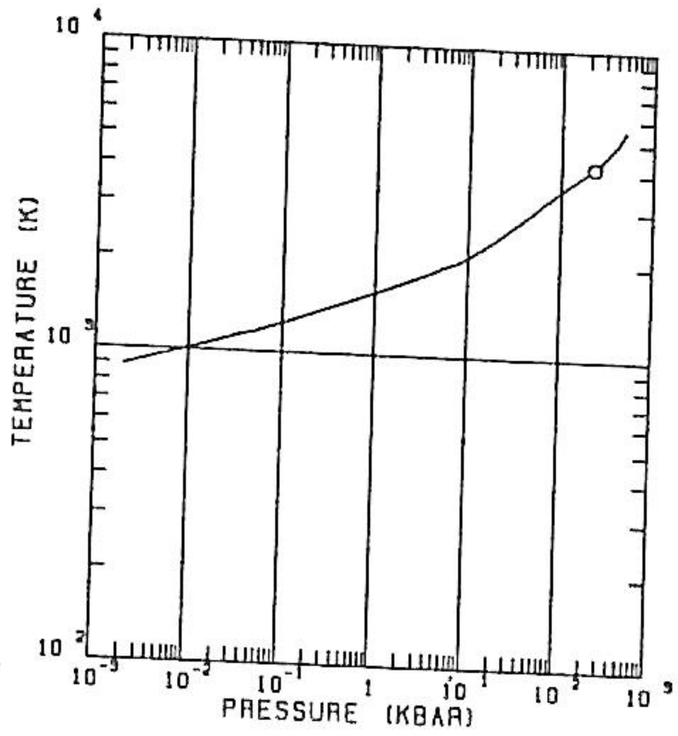
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

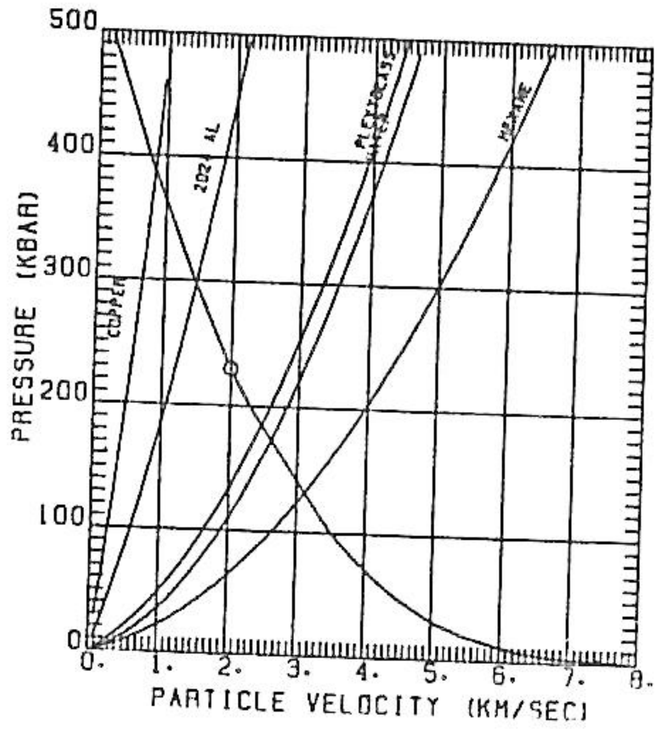
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	SIO2(S)
229.553	1.76263	0.40519	0.18164	0.49750	0.03586	0.00022	0.01233	0.00699	0.00067	0.00025	0.00491	1.21759	0.26970
200.000	1.74574	0.39315	0.22524	0.49692	0.04888	0.00013	0.01492	0.00597	0.00076	0.00047	0.00346	1.18581	0.26970
100.000	1.60194	0.33259	0.49741	0.49110	0.16182	0.00001	0.02954	0.00191	0.00085	0.00594	0.00047	0.96875	0.26970
80.000	1.53542	0.31830	0.59355	0.48923	0.21255	0.00000	0.03352	0.00119	0.00075	0.01105	0.00023	0.88177	0.26970
60.000	1.44036	0.30594	0.71404	0.48752	0.28124	0.00000	0.03709	0.00061	0.00058	0.02174	0.00009	0.76297	0.26970
50.000	1.37668	0.30150	0.78686	0.48692	0.32398	0.00000	0.03834	0.00039	0.00047	0.03136	0.00005	0.68495	0.26970
40.000	1.29717	0.29932	0.87093	0.48669	0.37290	0.00000	0.03881	0.00022	0.00035	0.04638	0.00002	0.58804	0.26970
30.000	1.19929	0.30092	0.96571	0.48722	0.42710	0.00000	0.03776	0.00010	0.00023	0.06907	0.00001	0.46899	0.26970
20.000	1.06484	0.31133	1.07944	0.48884	0.48258	0.00000	0.03457	0.00003	0.00011	0.11099	0.00000	0.30292	0.26970
10.000	0.87252	0.33947	1.21552	0.49268	0.53188	0.00000	0.02691	0.00001	0.00003	0.18827	0.00000	0.06142	0.26970
8.000	0.82474	0.35068	1.24087	0.49389	0.53832	0.00000	0.02447	0.00000	0.00002	0.21077	0.00000	0.00235	0.26970
6.000	0.81147	0.36000	1.23552	0.49524	0.55893	0.00000	0.02176	0.00000	0.00002	0.20914	0.00000	0.0	0.26970
5.000	0.80404	0.36691	1.22911	0.49603	0.56968	0.00000	0.02020	0.00000	0.00001	0.20865	0.00000	0.0	0.26970
4.000	0.79514	0.37524	1.22139	0.49690	0.58239	0.00000	0.01845	0.00000	0.00001	0.20806	0.00000	0.0	0.26970
3.000	0.78350	0.38918	1.20512	0.49792	0.59245	0.00000	0.01640	0.00000	0.00001	0.21038	0.00000	0.0	0.26970
2.000	0.76725	0.41023	1.17934	0.49917	0.60296	0.00000	0.01390	0.00000	0.00000	0.21513	0.00000	0.0	0.26970
1.000	0.73903	0.45169	1.12463	0.50087	0.60985	0.00000	0.01048	0.00000	0.00000	0.22836	0.00000	0.0	0.26970
0.800	0.72976	0.46619	1.10490	0.50133	0.61004	0.00000	0.00956	0.00000	0.00000	0.23360	0.00000	0.0	0.26970
0.600	0.71748	0.48636	1.07684	0.50188	0.60817	0.00000	0.00847	0.00000	0.00000	0.24149	0.00000	0.0	0.26970
0.500	0.70955	0.49962	1.05826	0.50219	0.60641	0.00000	0.00784	0.00000	0.00000	0.24681	0.00000	0.0	0.26970
0.400	0.69958	0.51657	1.03427	0.50255	0.60340	0.00000	0.00711	0.00000	0.00000	0.25384	0.00000	0.0	0.26970
0.300	0.68639	0.53948	1.00163	0.50298	0.59836	0.00000	0.00626	0.00000	0.00000	0.26359	0.00000	0.0	0.26970
0.200	0.66683	0.57520	0.94977	0.50351	0.58717	0.00000	0.00521	0.00000	0.00000	0.27976	0.00000	0.0	0.26970
0.100	0.64694	0.63465	0.85077	0.50422	0.57501	0.00000	0.00379	0.00000	0.00000	0.29685	0.00000	0.02243	0.26970
0.080	0.65555	0.65120	0.80905	0.50439	0.57732	0.00000	0.00345	0.00000	0.00000	0.29164	0.00000	0.05281	0.26970
0.060	0.66544	0.67067	0.76024	0.50459	0.58217	0.00000	0.00305	0.00000	0.00000	0.28457	0.00000	0.08922	0.26970
0.050	0.67231	0.68338	0.72795	0.50470	0.58436	0.00000	0.00283	0.00000	0.00000	0.28021	0.00000	0.11316	0.26970
0.040	0.68072	0.69862	0.68906	0.50483	0.58693	0.00000	0.00257	0.00000	0.00000	0.27491	0.00000	0.14212	0.26970
0.030	0.69159	0.71779	0.63985	0.50498	0.58990	0.00000	0.00227	0.00000	0.00000	0.26821	0.00000	0.17886	0.26970
0.020	0.70703	0.74385	0.57230	0.50516	0.59307	0.00000	0.00191	0.00000	0.00000	0.25918	0.00000	0.22935	0.26970
0.010	0.73399	0.78543	0.46217	0.50540	0.59488	0.00000	0.00142	0.00000	0.00000	0.24516	0.00000	0.31189	0.26970
0.008	0.74252	0.79757	0.42936	0.50547	0.59495	0.00000	0.00129	0.00000	0.00000	0.24096	0.00000	0.33678	0.26970
0.006	0.75504	0.81318	0.38563	0.50554	0.59210	0.00000	0.00115	0.00000	0.00000	0.23624	0.00000	0.36963	0.26970
0.005	0.76153	0.82163	0.36225	0.50559	0.59223	0.00000	0.00106	0.00000	0.00000	0.23299	0.00000	0.38780	0.26970
0.004	0.77065	0.83197	0.33245	0.50563	0.59022	0.00000	0.00096	0.00000	0.00000	0.22950	0.00000	0.41074	0.26970
0.003	0.78415	0.84479	0.29331	0.50569	0.58438	0.00000	0.00085	0.00000	0.00000	0.22576	0.00000	0.44078	0.26970
0.002	0.80245	0.85994	0.24472	0.50576	0.57636	0.00000	0.00072	0.00000	0.00000	0.22072	0.00000	0.47928	0.26970
300.000	1.77770	0.41572	0.13369	0.49557	0.02267	0.00073	0.00979	0.01141	0.00070	0.00010	0.01128	1.25516	0.26970
400.000	1.78405	0.41669	0.09985	0.48889	0.01478	0.00240	0.00839	0.01887	0.00075	0.00005	0.02605	1.28809	0.26970
500.000	1.78971	0.42483	0.07917	0.48863	0.01078	0.00244	0.00810	0.01667	0.00053	0.00004	0.02686	1.30064	0.26970

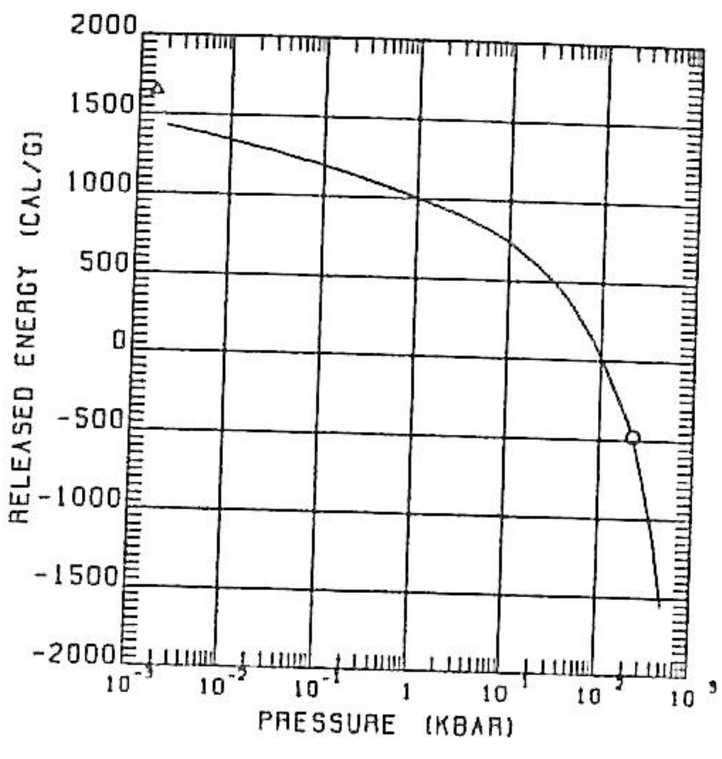
PRESS ;KBAR, PRODUCTS ;MOLES

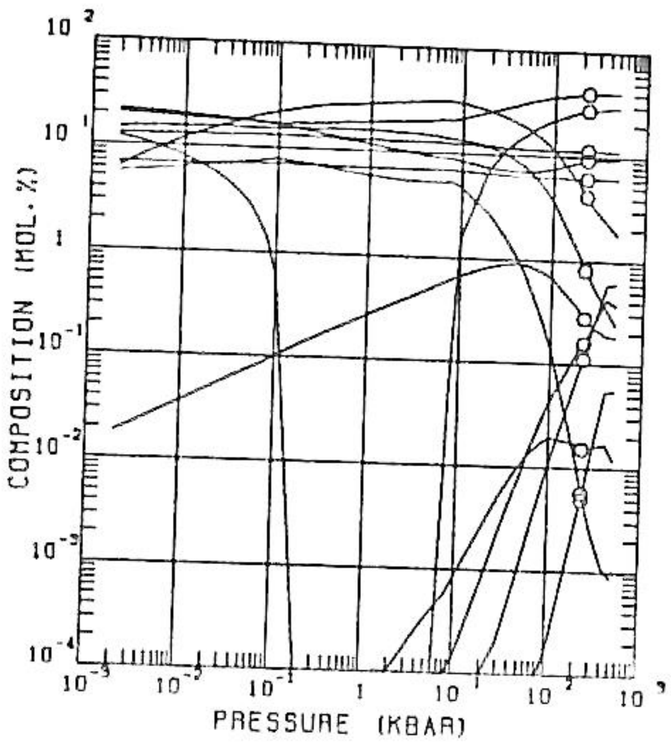
K-H-T ISENTROPE THRU C-J POINT











XTX8003: PETN 80/SYLGARD

RHO (G/CC)	1.530
E_0 (KCAL/MOLE)	-38.90
D_{C-J} (M/SEC)	7498.
P_{C-J} (KBAR)	229.6
T_{C-J} (K)	4109.

DATE 82-11-30

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

XTX 8004;RDX80/SYLGARD RHO = 1.5000 G/CC EO = -6.280391E+02 CAL/MOLE

LN P = -3.37887287 E+00 -2.40365314 E+00LN V 3.19408476 E-01LN V*2 -3.21229771 E-02LN V*3 1.03779859 E-03LN V*4

LN T = 7.91842175 E+00 -5.04203975 E-01LN V 1.41210496 E-01LN V*2 -2.17202194 E-02LN V*3 1.20990258 E-03LN V*4

LN E = -1.51835918 E+00 4.86621916 E-01LNP 7.35776424 E-02LN P*2 5.59962913 E-03LN P*3 1.57507689 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE . (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (557.824)	0.3634	5534.7 (5417.5)	-1592.4	0.16663 (0.16168)	3.1534	115.9
400.000 (419.241)	0.3982	4998.2 (5014.8)	-1177.1	0.14925 (0.14857)	3.0767	716.4
300.000 (300.377)	0.4445	4509.8 (4592.1)	-773.3	0.13236 (0.13439)	2.9871	1401.5
* 227.052 (222.627)	0.4921	4141.9 (4251.3)	-473.7	0.11982 (0.12300)	2.9065	1990.7
200.000 (193.203)	0.5169	4051.9 (4101.7)	-387.8	0.11622 (0.11845)	2.8684	2260.5
100.000 (93.930)	0.6706	3510.0 (3442.3)	21.9	0.09909 (0.09900)	2.6746	3481.6
80.000 (75.104)	0.7298	3338.8 (3268.1)	128.5	0.09462 (0.09424)	2.6146	3815.1
60.000 (56.637)	0.8142	3120.7 (3066.2)	254.1	0.08937 (0.08893)	2.5390	4209.3
50.000 (47.451)	0.8736	2989.0 (2949.0)	325.6	0.08638 (0.08598)	2.4918	4442.6
40.000 (38.250)	0.9535	2838.3 (2815.1)	404.2	0.08309 (0.08273)	2.4343	4713.4
30.000 (29.545)	1.0618	2660.3 (2667.0)	494.5	0.07931 (0.07905)	2.3657	5020.0
20.000 (20.040)	1.2557	2442.5 (2466.8)	599.1	0.07493 (0.07469)	2.2631	5447.8
10.000 (10.297)	1.7056	2144.1 (2178.2)	739.9	0.06904 (0.06891)	2.0894	6102.2
8.000 (8.282)	1.8956	2066.3 (2097.0)	776.2	0.06752 (0.06739)	2.0334	6297.6
6.000 (6.242)	2.1839	1975.7 (1999.9)	818.7	0.06574 (0.06561)	1.9615	6539.6
5.000 (5.209)	2.3974	1923.0 (1942.4)	843.6	0.06471 (0.06458)	1.9160	6688.0
4.000 (4.168)	2.6981	1863.1 (1876.2)	871.9	0.06352 (0.06340)	1.8605	6864.7
3.000 (3.119)	3.1626	1792.0 (1797.3)	906.0	0.06209 (0.06200)	1.7895	7084.9
2.000 (2.066)	4.0073	1702.1 (1697.7)	949.7	0.06026 (0.06021)	1.6915	7381.5
1.000 (1.018)	6.2219	1569.2 (1555.3)	1016.7	0.05746 (0.05750)	1.5325	7855.7
0.800 (0.808)	7.2497	1532.0 (1515.6)	1035.5	0.05668 (0.05669)	1.4841	8002.2
0.600 (0.602)	8.8750	1483.6 (1468.7)	1061.6	0.05558 (0.05568)	1.4251	8184.6
0.500 (0.499)	10.1472	1455.3 (1440.8)	1076.6	0.05495 (0.05505)	1.3892	8299.2
0.400 (0.396)	12.0035	1421.2 (1408.5)	1095.4	0.05417 (0.05429)	1.3475	8436.8
0.300 (0.295)	15.0133	1378.7 (1369.5)	1119.2	0.05317 (0.05334)	1.2978	8611.0
0.200 (0.195)	20.8273	1321.6 (1318.4)	1152.1	0.05180 (0.05201)	1.2363	8850.6
0.100 (0.097)	37.3248	1231.6 (1237.8)	1205.7	0.04955 (0.04977)	1.1571	9244.7
0.080 (0.078)	45.2858	1205.4 (1212.7)	1221.1	0.04891 (0.04906)	1.1388	9368.5
0.060 (0.059)	58.1322	1172.0 (1180.7)	1241.7	0.04805 (0.04816)	1.1206	9524.7
0.050 (0.049)	68.1544	1151.5 (1160.5)	1254.4	0.04751 (0.04759)	1.1120	9622.3
0.040 (0.040)	82.8633	1127.1 (1135.8)	1269.6	0.04688 (0.04691)	1.1044	9740.7
0.030 (0.030)	106.6946	1096.7 (1104.1)	1288.7	0.04608 (0.04604)	1.0993	9891.7
0.020 (0.020)	152.5278	1055.7 (1059.6)	1314.6	0.04500 (0.04487)	1.1003	10101.6
0.010 (0.010)	281.4299	989.7 (986.4)	1356.5	0.04324 (0.04302)	1.1214	10454.1
0.008 (0.008)	342.9795	969.6 (964.3)	1369.1	0.04271 (0.04248)	1.1327	10566.1
0.006 (0.006)	442.5457	944.2 (937.4)	1385.1	0.04205 (0.04184)	1.1500	10709.3
0.005 (0.005)	519.9944	928.2 (921.7)	1395.1	0.04163 (0.04147)	1.1623	10799.1
0.004 (0.004)	633.6475	909.2 (903.8)	1406.9	0.04113 (0.04105)	1.1787	10908.2
0.003 (0.003)	817.4778	885.1 (883.7)	1421.7	0.04051 (0.04058)	1.2016	11047.1
0.002 (0.002)	1170.1372	851.8 (862.2)	1441.8	0.03967 (0.04008)	1.2367	11238.9

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-30>> **********

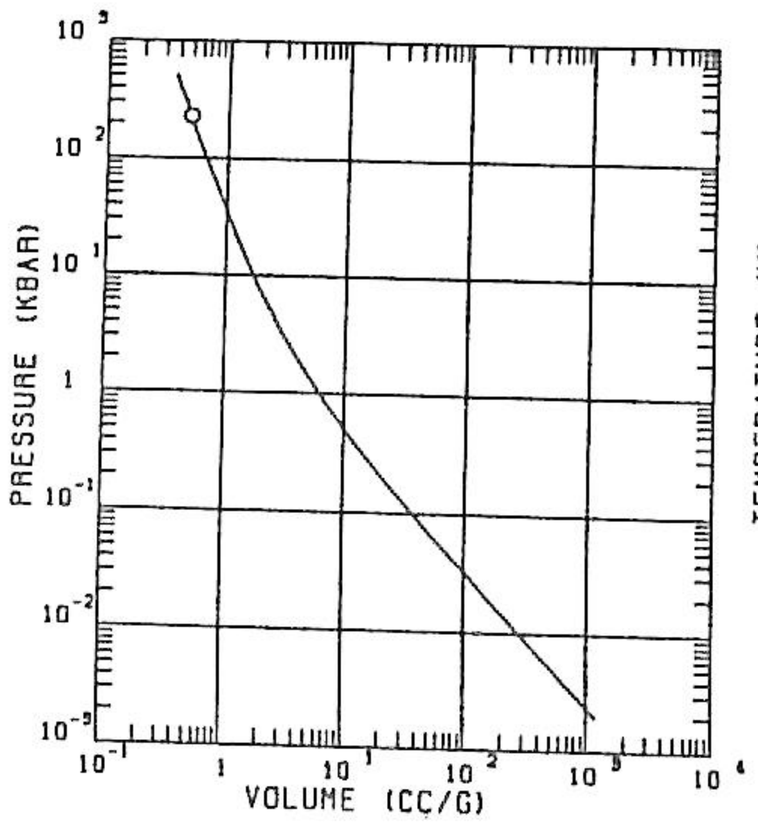
XTX 8004;RDX80/SYLGARD RHO = 1.5000 G/CC EO = -6.280391E+02 CAL/MOLE

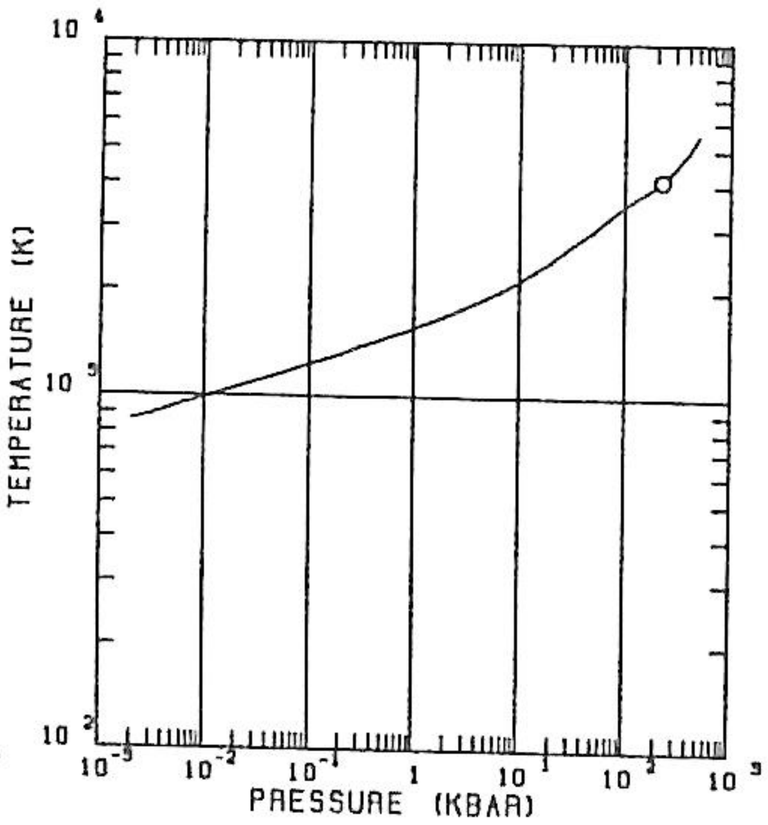
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

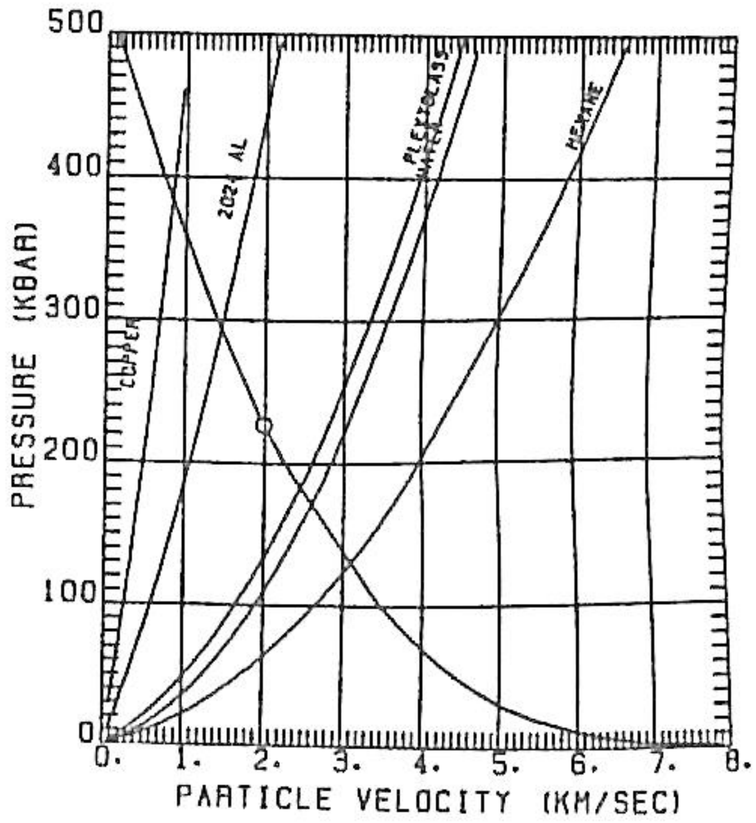
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	SIO2(S)
227.052	1.70305	0.05744	0.06678	1.04817	0.08833	0.00003	0.06214	0.00400	0.00103	0.00126	0.00254	1.49444	0.26970
200.000	1.67150	0.06349	0.08730	1.04566	0.11017	0.00002	0.06773	0.00355	0.00112	0.00201	0.00195	1.46712	0.26970
100.000	1.45059	0.09140	0.25629	1.03548	0.27258	0.00000	0.08971	0.00127	0.00108	0.01535	0.00035	1.25687	0.26970
80.000	1.36352	0.09880	0.32922	1.03414	0.33547	0.00000	0.09255	0.00083	0.00094	0.02546	0.00019	1.16644	0.26970
60.000	1.25018	0.10748	0.42569	1.03433	0.41257	0.00000	0.09227	0.00044	0.00071	0.04394	0.00008	1.04281	0.26970
50.000	1.17848	0.11276	0.48699	1.03538	0.45727	0.00000	0.09020	0.00029	0.00057	0.05906	0.00004	0.96110	0.26970
40.000	1.09185	0.11912	0.56109	1.03742	0.50612	0.00000	0.08615	0.00017	0.00042	0.08106	0.00002	0.85864	0.26970
30.000	0.99282	0.12718	0.64412	1.04105	0.55545	0.00000	0.07890	0.00008	0.00028	0.11141	0.00001	0.73723	0.26970
20.000	0.85437	0.13875	0.75946	1.04671	0.60533	0.00000	0.06760	0.00003	0.00014	0.16422	0.00000	0.55751	0.26970
10.000	0.67743	0.15911	0.89566	1.05612	0.63800	0.00000	0.04878	0.00000	0.00004	0.25049	0.00000	0.31465	0.26970
8.000	0.63449	0.16553	0.92580	1.05868	0.64133	0.00000	0.04365	0.00000	0.00003	0.27416	0.00000	0.25446	0.26970
6.000	0.58932	0.17405	0.95389	1.06160	0.64249	0.00000	0.03781	0.00000	0.00002	0.30054	0.00000	0.19144	0.26970
5.000	0.56589	0.17968	0.96608	1.06323	0.64204	0.00000	0.03455	0.00000	0.00001	0.31493	0.00000	0.15923	0.26970
4.000	0.54193	0.18681	0.97574	1.06502	0.64088	0.00000	0.03098	0.00000	0.00001	0.33016	0.00000	0.12720	0.26970
3.000	0.51801	0.19661	0.98009	1.06701	0.63858	0.00000	0.02700	0.00000	0.00001	0.34627	0.00000	0.09694	0.26970
2.000	0.49474	0.21157	0.97343	1.06932	0.63496	0.00000	0.02238	0.00000	0.00000	0.36318	0.00000	0.07173	0.26970
1.000	0.47696	0.24084	0.93269	1.07225	0.62891	0.00000	0.01651	0.00000	0.00000	0.37949	0.00000	0.06689	0.26970
0.800	0.47459	0.25025	0.91626	1.07300	0.62920	0.00000	0.01502	0.00000	0.00000	0.38165	0.00000	0.07175	0.26970
0.600	0.47742	0.26516	0.88359	1.07385	0.62616	0.00000	0.01331	0.00000	0.00000	0.38303	0.00000	0.08812	0.26970
0.500	0.47942	0.27396	0.86398	1.07434	0.62631	0.00000	0.01234	0.00000	0.00000	0.38269	0.00000	0.09927	0.26970
0.400	0.48412	0.28566	0.83589	1.07489	0.62579	0.00000	0.01125	0.00000	0.00000	0.38142	0.00000	0.11693	0.26970
0.300	0.49248	0.30133	0.79620	1.07552	0.62534	0.00000	0.00998	0.00000	0.00000	0.37841	0.00000	0.14397	0.26970
0.200	0.50773	0.32420	0.73526	1.07630	0.62497	0.00000	0.00843	0.00000	0.00000	0.37214	0.00000	0.18832	0.26970
0.100	0.53924	0.36351	0.62512	1.07736	0.62466	0.00000	0.00631	0.00000	0.00000	0.35813	0.00000	0.27316	0.26970
0.080	0.54899	0.37506	0.59227	1.07764	0.62621	0.00000	0.00574	0.00000	0.00000	0.35291	0.00000	0.29967	0.26970
0.060	0.56313	0.39061	0.54706	1.07797	0.62578	0.00000	0.00509	0.00000	0.00000	0.34654	0.00000	0.33568	0.26970
0.050	0.57222	0.40028	0.51863	1.07816	0.62515	0.00000	0.00471	0.00000	0.00000	0.34259	0.00000	0.35841	0.26970
0.040	0.58332	0.41179	0.48448	1.07837	0.62421	0.00000	0.00429	0.00000	0.00000	0.33783	0.00000	0.38579	0.26970
0.030	0.59774	0.42607	0.44152	1.07861	0.62227	0.00000	0.00380	0.00000	0.00000	0.33195	0.00000	0.42036	0.26970
0.020	0.61823	0.44505	0.38310	1.07891	0.61799	0.00000	0.00321	0.00000	0.00000	0.32430	0.00000	0.46748	0.26970
0.010	0.65402	0.47353	0.29031	1.07931	0.60530	0.00000	0.00240	0.00000	0.00000	0.31335	0.00000	0.54276	0.26970
0.008	0.66552	0.48129	0.26326	1.07942	0.60013	0.00000	0.00219	0.00000	0.00000	0.31035	0.00000	0.56503	0.26970
0.006	0.68080	0.49036	0.22991	1.07955	0.59183	0.00000	0.00194	0.00000	0.00000	0.30704	0.00000	0.59265	0.26970
0.005	0.69089	0.49548	0.20954	1.07962	0.58531	0.00000	0.00180	0.00000	0.00000	0.30536	0.00000	0.60954	0.26970
0.004	0.70321	0.50096	0.18629	1.07970	0.57691	0.00000	0.00164	0.00000	0.00000	0.30352	0.00000	0.62912	0.26970
0.003	0.71956	0.50675	0.15837	1.07979	0.56444	0.00000	0.00146	0.00000	0.00000	0.30172	0.00000	0.65308	0.26970
0.002	0.74377	0.51227	0.12313	1.07990	0.54337	0.00000	0.00124	0.00000	0.00000	0.30032	0.00000	0.68420	0.26970
300.000	1.73704	0.04857	0.04473	1.04914	0.06187	0.00009	0.05709	0.00658	0.00117	0.00059	0.00565	1.52602	0.26970
400.000	1.75280	0.04124	0.03155	1.04586	0.04516	0.00027	0.05647	0.01112	0.00143	0.00033	0.01283	1.54679	0.26970
500.000	1.76359	0.03992	0.02471	1.04553	0.03443	0.00026	0.05708	0.00978	0.00104	0.00028	0.01288	1.55499	0.26970

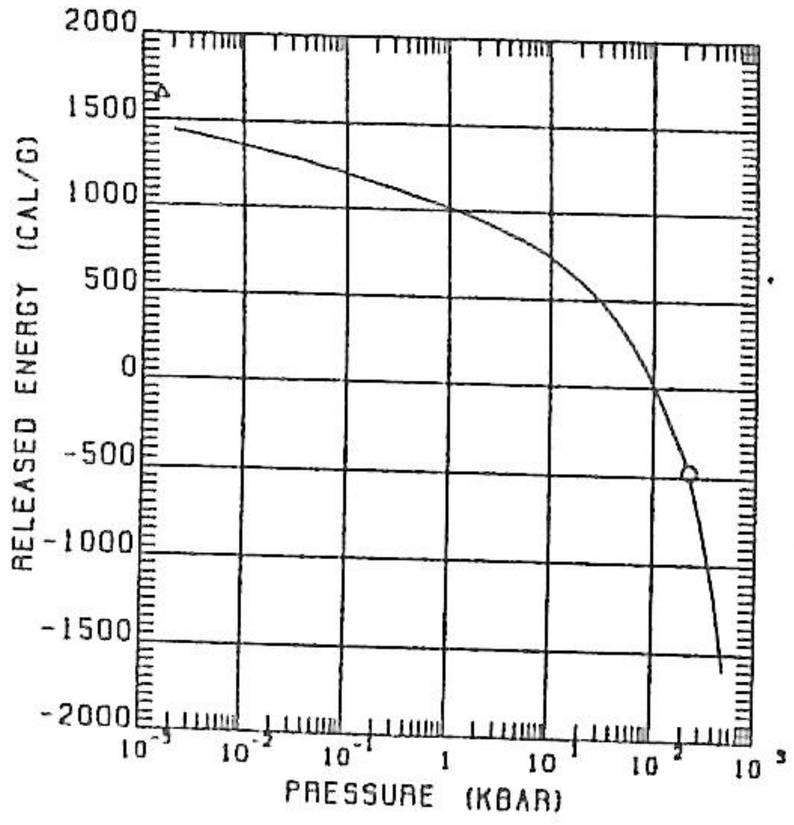
PRESS ;KBAR, PRODUCTS ;MOLES

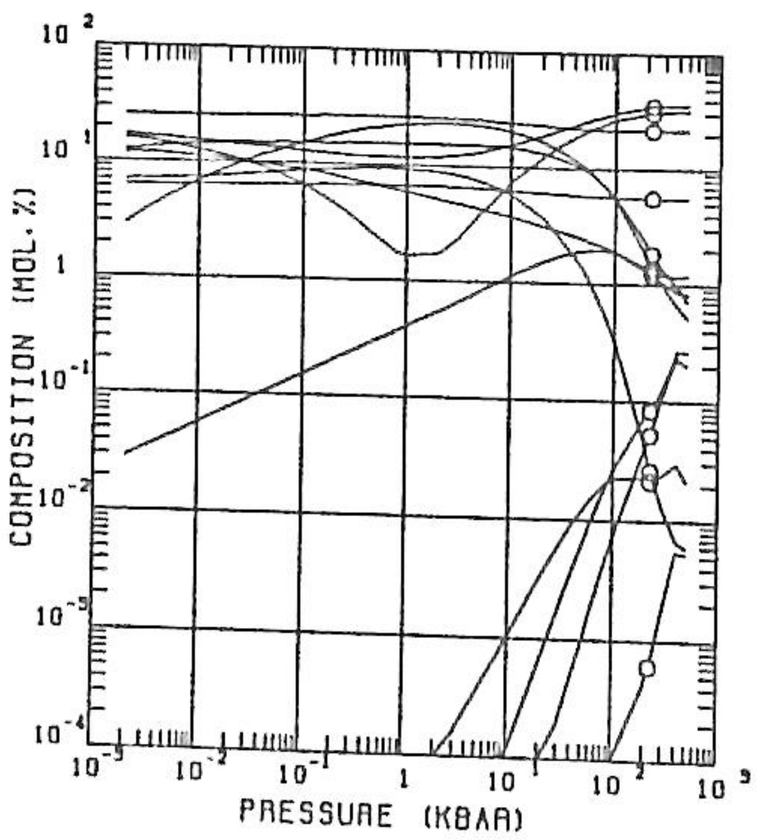
K-H-T ISENTROPE THRU C-J POINT











XTX 8004; RDX80/SYLGARD

RHO (G/CC)	1.500
E_0 (KCAL/MOLE)	-0.63
D_{C-J} (M/SEC)	7604.
P_{C-J} (KBAR)	227.1
T_{C-J} (K)	4142.

DATE 82-11-30

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES	HMX/EXON/W # 55/10/35 VOL
RHO (G/CC)	7.900
EO (KCAL/MOLE)	1.13
MOL.WEIGHT (G)	794.339
C	1.7567
H	2.9954
N	2.8228
O	2.8228
F	0.3452
CL	0.1726
W	3.6597
DETN.VEL (M/SEC)	4585.9
PARTICL.VEL(")	800.1
C-J PRESS (KBAR)	289.9
C-J VOLUME (CC/G)	0.10450
C-J TEMP (DEG K)	2502.4
C-J S(CAL/DEG MOL)	69.88
C-J ENERGY (CAL/G)	76.49
GAMMA	4.732
C-J DETN.HEAT(CAL)	218.3
LAMDA	9.0105
VOLUM(K LITTRE/KG)	0.1220
TOTAL PRODCT(MOLE)	8.5846
V GAS (MOLES)	3.9620
V GAS (CC/MOLE)	11.7951
V SOL C(S) (CC/G)	0.25774
V SOL W(S) (CC/G)	0.04948
H2O (MOL %)	14.4239
CO2 (MOL %)	9.2082
CO (MOL %)	0.0391
N2 (MOL %)	16.4388
CF4 (MOL %)	0.0000
H2 (MOL %)	0.0018
O2 (MOL %)	0.0000
NH3 (MOL %)	0.0022
OH (MOL %)	0.0004
H (MOL %)	0.0000
CH4 (MOL %)	0.0000
NO (MOL %)	0.0027
HCL (MOL %)	2.0121
CCL4 (MOL %)	0.0000
HF (MOL %)	4.0230
F2 (MOL %)	0.0000
CL2 (MOL %)	0.0000
C(S) (MOL %)	11.2163
W(S) (MOL %)	42.6314

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

HMX/EXON/W 55/10/35 VOL RHO = 7.9000 G/CC EO = 1.133836E+03 CAL/MOLE

LN P = -7.19314194 E+00 -1.50789833 E+00LN V 2.73784935 E-01LN V*2 -8.06823969 E-02LN V*3 7.97265768 E-03LN V*4

LN T = 7.14798546 E+00 -1.28717482 E-01LN V 4.12068963 E-02LN V*2 -1.61398947 E-02LN V*3 1.79700134 E-03LN V*4

LN E = -2.18131447 E+00 8.27810764 E-02LNP 1.52040236 E-02LN P*2 1.26669207 E-03LN P*3 3.81381833 E-05LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (583.227)	0.0892	3275.6 (2947.9)	-239.0	0.11000 (0.10863)	4.6950	111.6
500.000 (479.922)	0.0930	2997.7 (2862.2)	-184.7	0.10773 (0.10733)	4.6004	309.3
400.000 (385.976)	0.0976	2757.5 (2770.0)	-133.3	0.10558 (0.10589)	4.4943	524.5
300.000 (294.645)	0.1037	2526.5 (2660.7)	-81.9	0.10342 (0.10424)	4.3623	772.3
* 289.857 (285.387)	0.1045	2502.4 (2648.1)	-76.4	0.10320 (0.10406)	4.3467	800.1
200.000 (198.209)	0.1138	2417.3 (2509.6)	-39.8	0.10167 (0.10227)	4.1677	1084.8
100.000 (101.424)	0.1346	2248.2 (2278.0)	11.4	0.09952 (0.09969)	3.8366	1529.1
80.000 (81.768)	0.1425	2191.3 (2209.5)	24.3	0.09898 (0.09904)	3.7297	1653.5
60.000 (61.884)	0.1538	2115.7 (2124.9)	39.0	0.09837 (0.09830)	3.5910	1803.0
50.000 (51.812)	0.1617	2067.1 (2073.2)	47.3	0.09802 (0.09790)	3.5024	1892.1
40.000 (41.628)	0.1723	2007.3 (2011.9)	56.5	0.09763 (0.09745)	3.3932	1995.9
30.000 (31.338)	0.1876	1932.0 (1936.1)	67.0	0.09719 (0.09696)	3.2513	2121.4
20.000 (20.946)	0.2132	1828.4 (1835.6)	79.8	0.09666 (0.09639)	3.0498	2283.9
10.000 (10.343)	0.2727	1671.4 (1678.1)	97.0	0.09594 (0.09569)	2.6982	2532.0
8.000 (8.218)	0.2975	1626.2 (1631.5)	101.7	0.09574 (0.09552)	2.5844	2604.5
6.000 (6.094)	0.3351	1572.4 (1574.4)	107.1	0.09552 (0.09533)	2.4376	2693.7
5.000 (5.035)	0.3629	1540.9 (1539.9)	110.3	0.09539 (0.09523)	2.3447	2747.9
4.000 (3.985)	0.4020	1504.0 (1499.6)	113.9	0.09523 (0.09512)	2.2320	2811.9
3.000 (2.942)	0.4627	1460.8 (1450.5)	118.1	0.09506 (0.09499)	2.0882	2891.2
2.000 (1.924)	0.5728	1403.5 (1387.8)	123.8	0.09482 (0.09483)	1.8937	2996.5
1.000 (0.947)	0.8615	1316.8 (1297.4)	132.4	0.09446 (0.09458)	1.5950	3161.6
0.800 (0.759)	0.9940	1291.2 (1272.5)	135.0	0.09435 (0.09450)	1.5112	3211.5
0.600 (0.572)	1.2057	1259.4 (1243.0)	138.2	0.09422 (0.09439)	1.4137	3274.1
0.500 (0.480)	1.3696	1239.8 (1225.5)	140.2	0.09414 (0.09432)	1.3586	3313.0
0.400 (0.387)	1.6096	1216.2 (1205.2)	142.6	0.09404 (0.09423)	1.2987	3360.0
0.300 (0.294)	1.9996	1186.5 (1180.4)	145.6	0.09391 (0.09410)	1.2341	3420.0
0.200 (0.200)	2.7569	1145.4 (1147.0)	149.8	0.09373 (0.09391)	1.1683	3503.9
0.100 (0.103)	4.9304	1077.4 (1089.7)	156.8	0.09344 (0.09355)	1.1209	3646.5
0.080 (0.083)	5.9806	1056.2 (1070.2)	159.0	0.09335 (0.09343)	1.1204	3692.4
0.060 (0.063)	7.6910	1029.4 (1044.2)	161.8	0.09323 (0.09326)	1.1274	3751.4
0.050 (0.052)	9.0295	1012.6 (1027.0)	163.5	0.09316 (0.09316)	1.1352	3788.7
0.040 (0.042)	10.9992	992.4 (1005.4)	165.6	0.09307 (0.09303)	1.1469	3834.2
0.030 (0.031)	14.1999	966.9 (976.7)	168.2	0.09296 (0.09287)	1.1633	3892.4
0.020 (0.020)	20.3754	931.7 (935.2)	171.7	0.09281 (0.09266)	1.1832	3973.4
0.010 (0.010)	37.8154	873.4 (865.6)	177.5	0.09257 (0.09236)	1.1841	4106.7
0.008 (0.008)	46.1503	855.2 (844.8)	179.2	0.09250 (0.09230)	1.1694	4147.9
0.006 (0.006)	59.6530	831.9 (820.2)	181.4	0.09241 (0.09224)	1.1357	4199.4
0.005 (0.005)	70.1782	817.3 (806.3)	182.8	0.09235 (0.09223)	1.1044	4231.1
0.004 (0.004)	85.6141	799.6 (791.2)	184.4	0.09228 (0.09223)	1.0542	4268.8
0.003 (0.003)	110.6002	777.0 (775.9)	186.5	0.09220 (0.09229)	0.9679	4315.5
0.002 (0.002)	158.5793	745.6 (764.0)	189.2	0.09208 (0.09247)	0.7995	4377.6

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

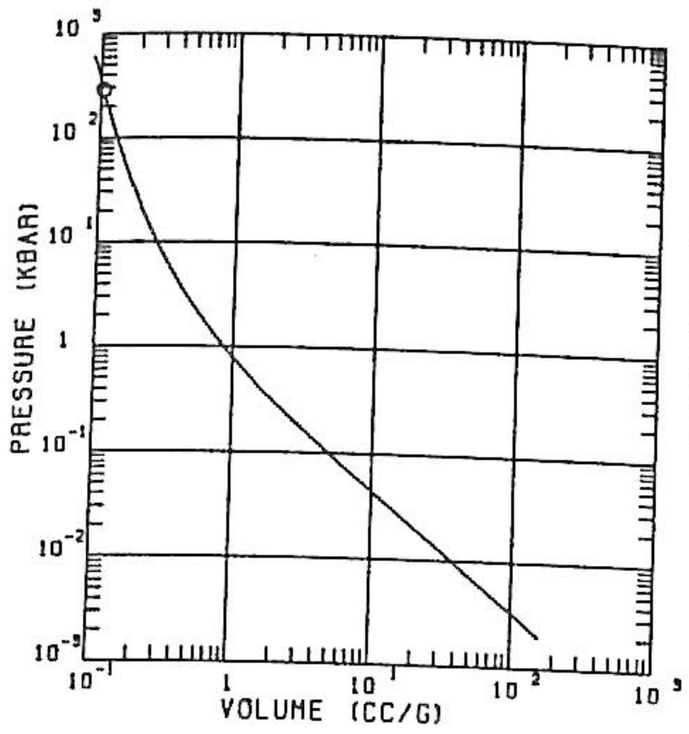
HMX/EXON/W 55/10/35 VOL RHO = 7.9000 G/CC EO = 1.133836E+03 CAL/MOLE

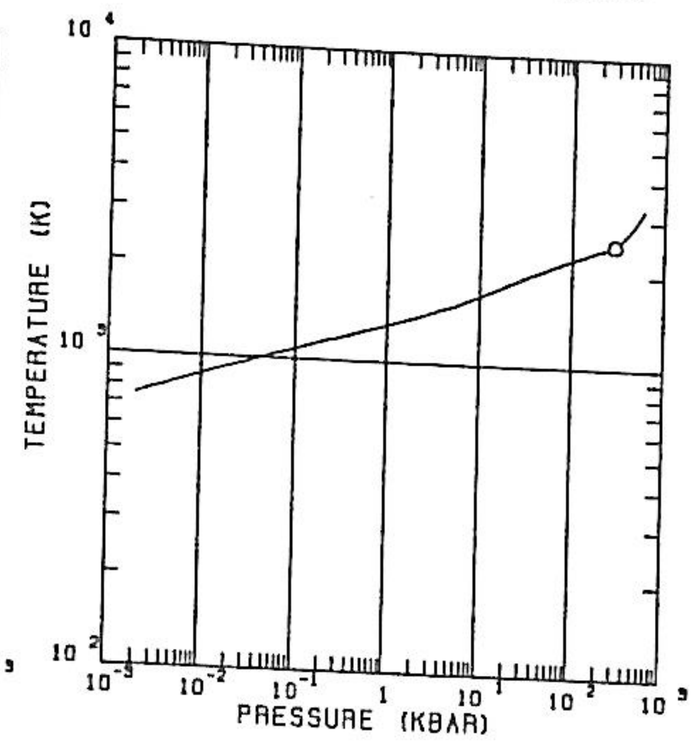
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

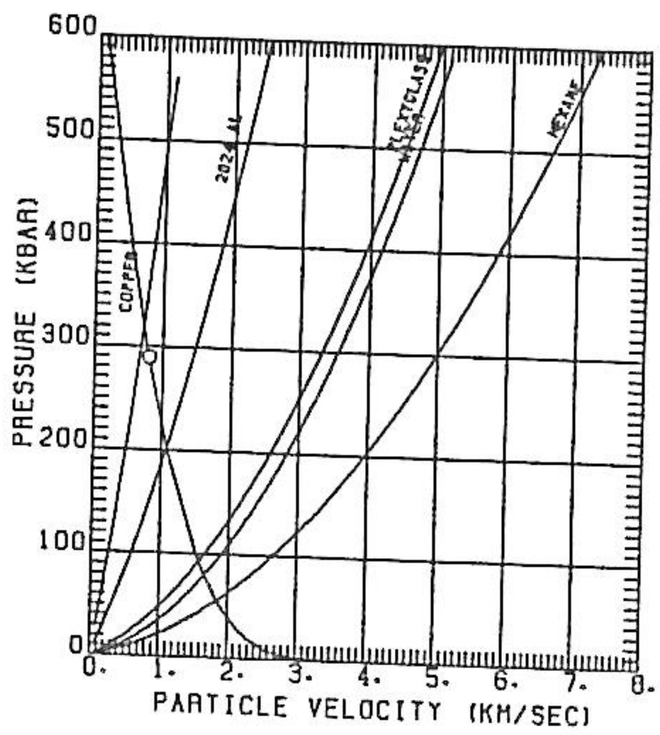
PRESS	H2O CCL4	CO2 HF	CO F2	N2 CL2	CF4 C(S)	H2 W(S)	O2	NH3	OH	H	CH4	NO	HCL
289.857	1.23823	0.79048	0.00337	1.41120	0.00000	0.00016	0.00000	0.00019	0.00004	0.00000	0.00000	0.00023	0.17273
	0.00000	0.34536	0.00000	0.00000	0.96287	3.65972							
200.000	1.23706	0.78714	0.01137	1.41110	0.00000	0.00078	0.00000	0.00056	0.00003	0.00000	0.00000	0.00007	0.17272
	0.00000	0.34535	0.00000	0.00000	0.95818	3.65972							
100.000	1.22723	0.76697	0.06164	1.41010	0.00000	0.00745	0.00000	0.00262	0.00001	0.00000	0.00003	0.00001	0.17272
	0.00000	0.34535	0.00000	0.00000	0.92806	3.65972							
80.000	1.21965	0.75542	0.09232	1.40949	0.00000	0.01304	0.00000	0.00385	0.00001	0.00000	0.00011	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.90884	3.65972							
60.000	1.20501	0.73803	0.14175	1.40850	0.00000	0.02405	0.00000	0.00582	0.00001	0.00000	0.00045	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.87646	3.65972							
50.000	1.19235	0.72644	0.17760	1.40778	0.00000	0.03355	0.00000	0.00726	0.00000	0.00000	0.00095	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.85170	3.65972							
40.000	1.17281	0.71285	0.22433	1.40685	0.00000	0.04785	0.00000	0.00912	0.00000	0.00000	0.00217	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.81735	3.65972							
30.000	1.14148	0.69850	0.28437	1.40573	0.00000	0.06965	0.00000	0.01137	0.00000	0.00000	0.00526	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.76858	3.65972							
20.000	1.08195	0.68653	0.36784	1.40432	0.00000	0.10533	0.00000	0.01418	0.00000	0.00000	0.01507	0.00000	0.17272
	0.00000	0.34535	0.00000	0.00000	0.68726	3.65972							
10.000	0.95394	0.69400	0.48092	1.40349	0.00000	0.16178	0.00000	0.01584	0.00000	0.00000	0.04960	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.53219	3.65972							
8.000	0.91175	0.70251	0.50610	1.40364	0.00000	0.17565	0.00000	0.01554	0.00000	0.00000	0.06398	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.48411	3.65972							
6.000	0.85987	0.71556	0.53188	1.40403	0.00000	0.19051	0.00000	0.01478	0.00000	0.00000	0.08307	0.00000	0.17273
	0.00000	0.34536	0.00000	0.00000	0.42620	3.65972							
5.000	0.82931	0.72445	0.54465	1.40434	0.00000	0.19841	0.00000	0.01415	0.00000	0.00000	0.09486	0.00000	0.17274
	0.00000	0.34537	0.00000	0.00000	0.39273	3.65972							
4.000	0.79558	0.73617	0.55496	1.40477	0.00000	0.20631	0.00000	0.01330	0.00000	0.00000	0.10842	0.00000	0.17274
	0.00000	0.34537	0.00000	0.00000	0.35718	3.65972							
3.000	0.75679	0.75060	0.56489	1.40534	0.00000	0.21529	0.00000	0.01215	0.00000	0.00000	0.12418	0.00000	0.17274
	0.00000	0.34538	0.00000	0.00000	0.31706	3.65972							
2.000	0.71389	0.77238	0.56421	1.40613	0.00000	0.22425	0.00000	0.01057	0.00000	0.00000	0.14233	0.00000	0.17274
	0.00000	0.34538	0.00000	0.00000	0.27779	3.65972							
1.000	0.66465	0.80924	0.53976	1.40731	0.00000	0.23479	0.00000	0.00821	0.00000	0.00000	0.16345	0.00000	0.17275
	0.00000	0.34541	0.00000	0.00000	0.24426	3.65972							
0.800	0.65408	0.82089	0.52704	1.40764	0.00000	0.23739	0.00000	0.00756	0.00000	0.00000	0.16792	0.00000	0.17276
	0.00000	0.34541	0.00000	0.00000	0.24088	3.65972							
0.600	0.64386	0.83577	0.50750	1.40803	0.00000	0.24027	0.00000	0.00678	0.00000	0.00000	0.17217	0.00000	0.17276
	0.00000	0.34540	0.00000	0.00000	0.24126	3.65972							
0.500	0.63919	0.84515	0.49341	1.40825	0.00000	0.24186	0.00000	0.00633	0.00000	0.00000	0.17405	0.00000	0.17276
	0.00000	0.34542	0.00000	0.00000	0.24409	3.65972							
0.400	0.63525	0.85649	0.47466	1.40851	0.00000	0.24362	0.00000	0.00581	0.00000	0.00000	0.17553	0.00000	0.17277
	0.00000	0.34542	0.00000	0.00000	0.25002	3.65972							
0.300	0.63282	0.87094	0.44820	1.40882	0.00000	0.24555	0.00000	0.00520	0.00000	0.00000	0.17623	0.00000	0.17277
	0.00000	0.34545	0.00000	0.00000	0.26134	3.65972							
0.200	0.63382	0.89085	0.40739	1.40921	0.00000	0.24758	0.00000	0.00442	0.00000	0.00000	0.17529	0.00000	0.17278
	0.00000	0.34546	0.00000	0.00000	0.28320	3.65972							
0.100	0.64442	0.92304	0.33241	1.40976	0.00000	0.24872	0.00000	0.00332	0.00000	0.00000	0.17024	0.00000	0.17279
	0.00000	0.34546	0.00000	0.00000	0.33104	3.65972							
0.080	0.64938	0.93263	0.30828	1.40991	0.00000	0.24846	0.00000	0.00303	0.00000	0.00000	0.16812	0.00000	0.17280
	0.00000	0.34546	0.00000	0.00000	0.34770	3.65972							
0.060	0.65659	0.94437	0.27760	1.41008	0.00000	0.24748	0.00000	0.00268	0.00000	0.00000	0.16525	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.36951	3.65972							
0.050	0.66161	0.95144	0.25843	1.41018	0.00000	0.24643	0.00000	0.00248	0.00000	0.00000	0.16341	0.00000	0.17280
	0.00000	0.34549	0.00000	0.00000	0.38347	3.65972							
0.040	0.66806	0.95955	0.23576	1.41030	0.00000	0.24482	0.00000	0.00225	0.00000	0.00000	0.16116	0.00000	0.17281
	0.00000	0.34549	0.00000	0.00000	0.40024	3.65972							
0.030	0.67684	0.96917	0.20775	1.41043	0.00000	0.24207	0.00000	0.00199	0.00000	0.00000	0.15834	0.00000	0.17281
	0.00000	0.34550	0.00000	0.00000	0.42146	3.65972							
0.020	0.69021	0.98095	0.17082	1.41059	0.00000	0.23669	0.00000	0.00167	0.00000	0.00000	0.15458	0.00000	0.17282
	0.00000	0.34554	0.00000	0.00000	0.45038	3.65972							
0.010	0.71586	0.99564	0.11581	1.41081	0.00000	0.22311	0.00000	0.00123	0.00000	0.00000	0.14886	0.00000	0.17284
	0.00000	0.34555	0.00000	0.00000	0.49643	3.65972							
0.008	0.72486	0.99873	0.10062	1.41087	0.00000	0.21760	0.00000	0.00112	0.00000	0.00000	0.14720	0.00000	0.17284
	0.00000	0.34557	0.00000	0.00000	0.51019	3.65972							
0.006	0.73710	1.00151	0.08283	1.41093	0.00000	0.20958	0.00000	0.00098	0.00000	0.00000	0.14520	0.00000	0.17285
	0.00000	0.34555	0.00000	0.00000	0.52722	3.65972							
0.005	0.74530	1.00253	0.07259	1.41097	0.00000	0.20391	0.00000	0.00090	0.00000	0.00000	0.14398	0.00000	0.17285
	0.00000	0.34557	0.00000	0.00000	0.53764	3.65972							
0.004	0.75566	1.00303	0.06125	1.41102	0.00000	0.19652	0.00000	0.00082	0.00000	0.00000	0.14256	0.00000	0.17286
	0.00000	0.34557	0.00000	0.00000	0.54991	3.65972							
0.003	0.76973	1.00240	0.04845	1.41107	0.00000	0.18616	0.00000	0.00072	0.00000	0.00000	0.14078	0.00000	0.17287
	0.00000	0.34558	0.00000	0.00000	0.56512	3.65972							
0.002	0.79089	0.99919	0.03371	1.41113	0.00000	0.17012	0.00000	0.00059	0.00000	0.00000	0.13830	0.00000	0.17288
	0.00000	0.34561	0.00000	0.00000	0.58557	3.65972							
300.000	1.23826	0.79055	0.00315	1.41119	0.00000	0.00014	0.00000	0.00018	0.00004	0.00000	0.00000	0.00027	0.17273
	0.00000	0.34536	0.00000	0.00000	0.96301	3.65972							
400.000	1.23840	0.79057	0.00197	1.41078	0.00000	0.00006	0.00003	0.00012	0.00010	0.00000	0.00000	0.00116	0.17273
	0.00000	0.34536	0.00000	0.00000	0.96418	3.65972							
500.000	1.23839	0.78944	0.00164	1.40963	0.00000	0.00004	0.00013	0.00011	0.00020	0.00000	0.00000	0.00346	0.17272
	0.00000	0.34536	0.00000	0.00000	0.96564	3.65972							
600.000	1.23821	0.78718	0.00211	1.40772	0.00000	0.00005	0.00028	0.00017	0.00036	0.00000	0.00000	0.00722	0.17272
	0.00000	0.34536	0.00000	0.00000	0.96743	3.65972							

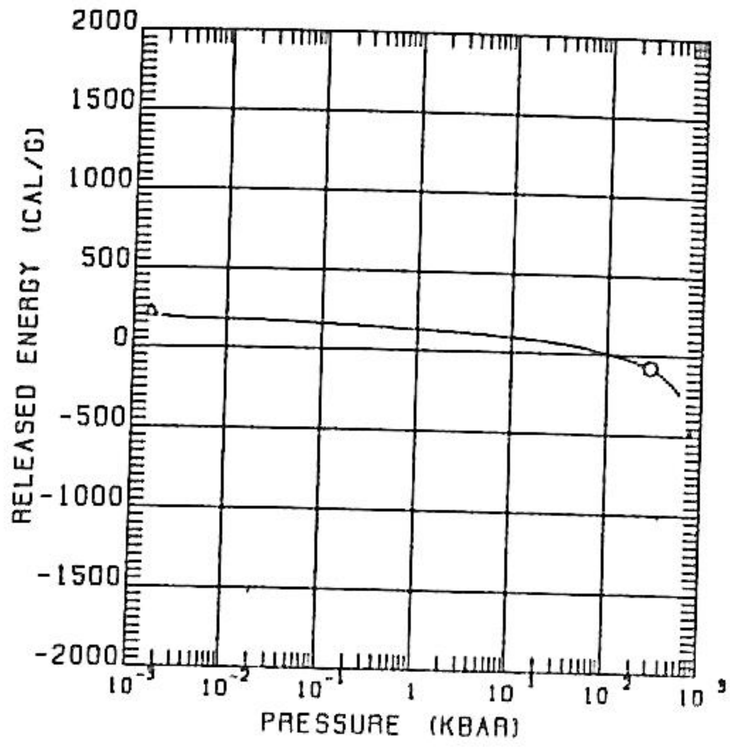
PRESS ;KBAR, PRODUCTS ;MOLES

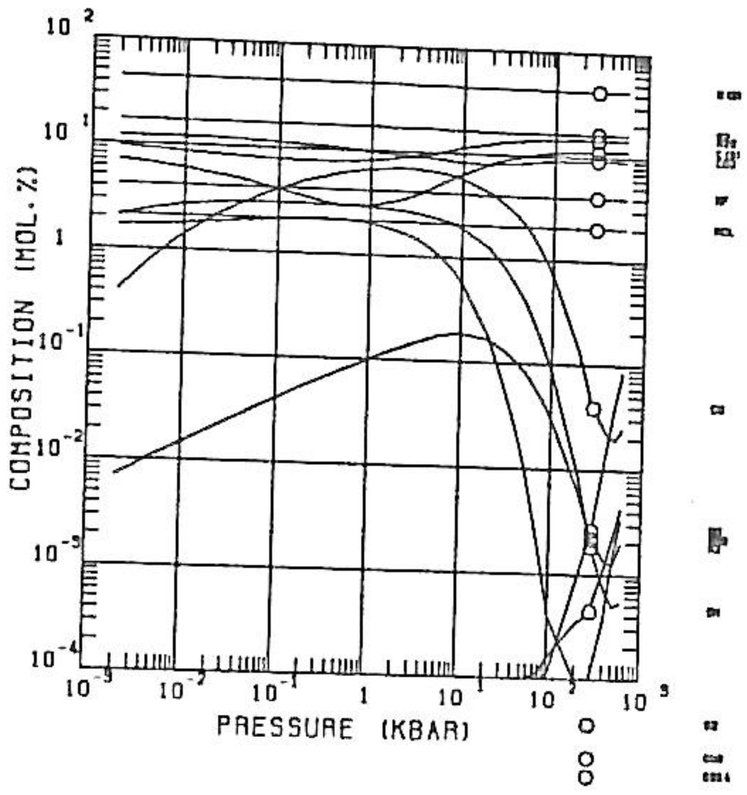
K-H-T ISENTROPE THRU C-J POINT











HMX/EXON/W 55/10/35 VOL

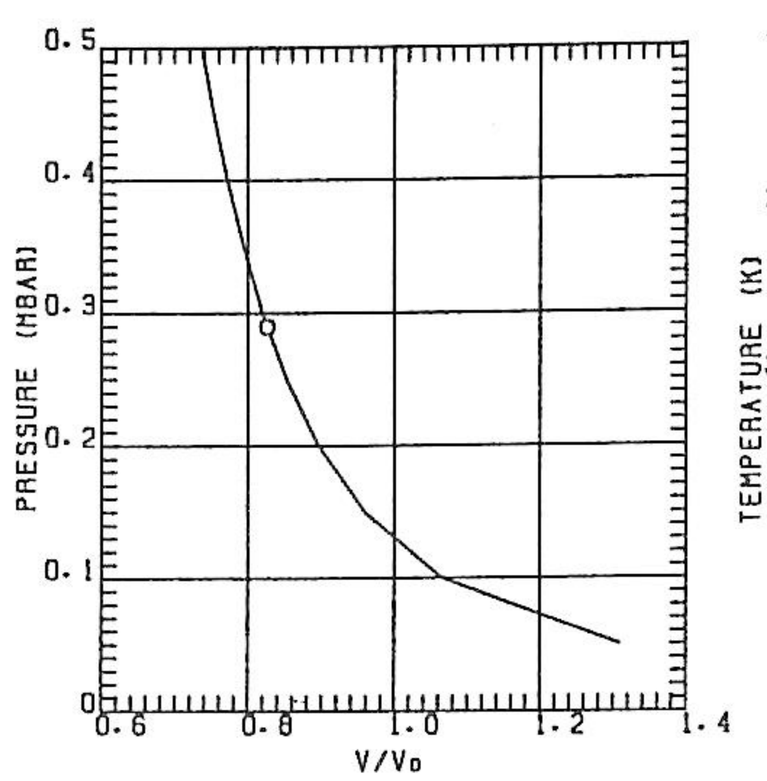
RHO (G/CC)	7.900
E_0 (KCAL/MOLE)	1.13
D_{C-J}(M/SEC)	4586.
P_{C-J}(KBAR)	289.9
T_{C-J}(K)	2502.

DATE 82-11-02

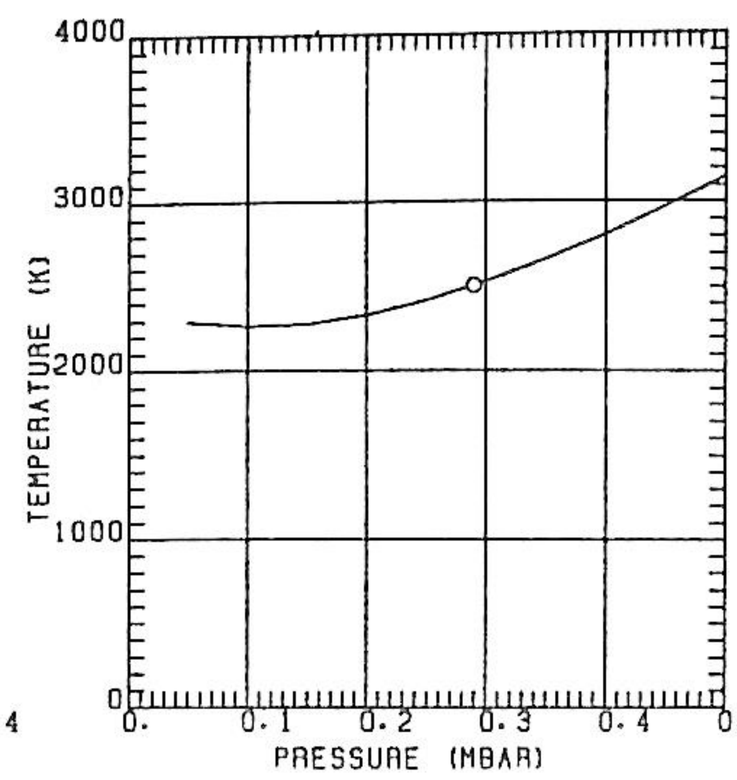
********** A K-H-T H U G O N I O T <<DATE 82-11-02>>**********

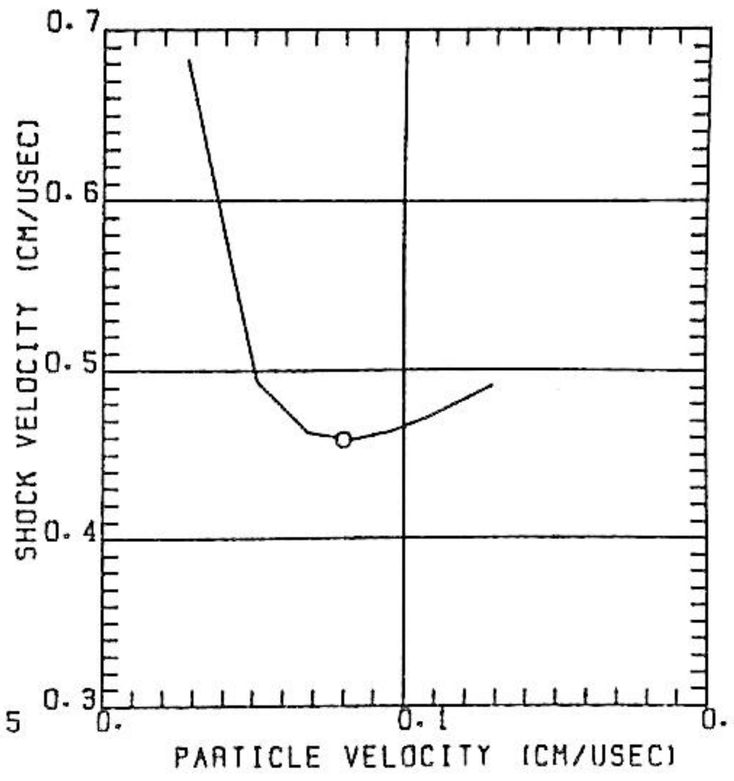
HMX/EXON/W 55/10/35 VOL RHO = 7.9000 G/CC, EO = 1.133836E+03 CAL/MOLE

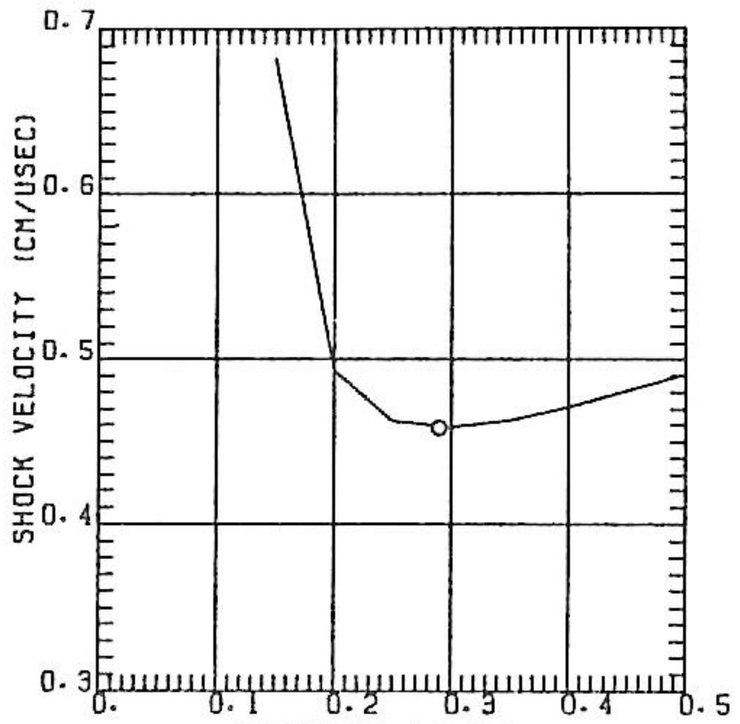
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.0933	0.0954	0.0977	0.1004	0.1037	0.1079	0.1134	0.1214	0.1348	0.1658
TEMP (DEG K)	3148.8	2969.3	2806.5	2658.5	2527.1	2414.6	2327.0	2273.7	2265.7	2293.5
US (M/SEC)	4908.0	4806.7	4712.0	4632.3	4587.6	4628.3	4931.6	6823.2	0.0	0.0
UP (M/SEC)	1289.6	1185.0	1074.5	956.4	827.8	683.7	513.3	278.3	0.0	0.0
H2O (MOLE)	1.2382	1.2383	1.2384	1.2383	1.2383	1.2380	1.2375	1.2356	1.2266	1.1566
CO2 (MOLE)	0.7881	0.7895	0.7903	0.7906	0.7905	0.7900	0.7886	0.7840	0.7654	0.6661
CO (MOLE)	0.0027	0.0024	0.0023	0.0026	0.0032	0.0046	0.0081	0.0192	0.0654	0.3340
N2 (MOLE)	1.4089	1.4100	1.4107	1.4110	1.4112	1.4112	1.4112	1.4109	1.4100	1.4058
CF4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2 (MOLE)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0006	0.0017	0.0079	0.0612
O2 (MOLE)	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0002	0.0001	0.0001	0.0001	0.0002	0.0003	0.0004	0.0009	0.0027	0.0111
OH (MOLE)	0.0003	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0021
NO (MOLE)	0.0049	0.0027	0.0013	0.0006	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000
HCL (MOLE)	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727	0.1727
CCL4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF (MOLE)	0.3454	0.3454	0.3454	0.3454	0.3454	0.3454	0.3454	0.3454	0.3453	0.3453
F2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL2 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C(S) (MOLE)	0.9659	0.9648	0.9641	0.9636	0.9630	0.9621	0.9600	0.9535	0.9259	0.7545
W(S) (MOLE)	3.6597	3.6597	3.6597	3.6597	3.6597	3.6597	3.6597	3.6597	3.6597	3.6597



K-H-T HUGONIOT







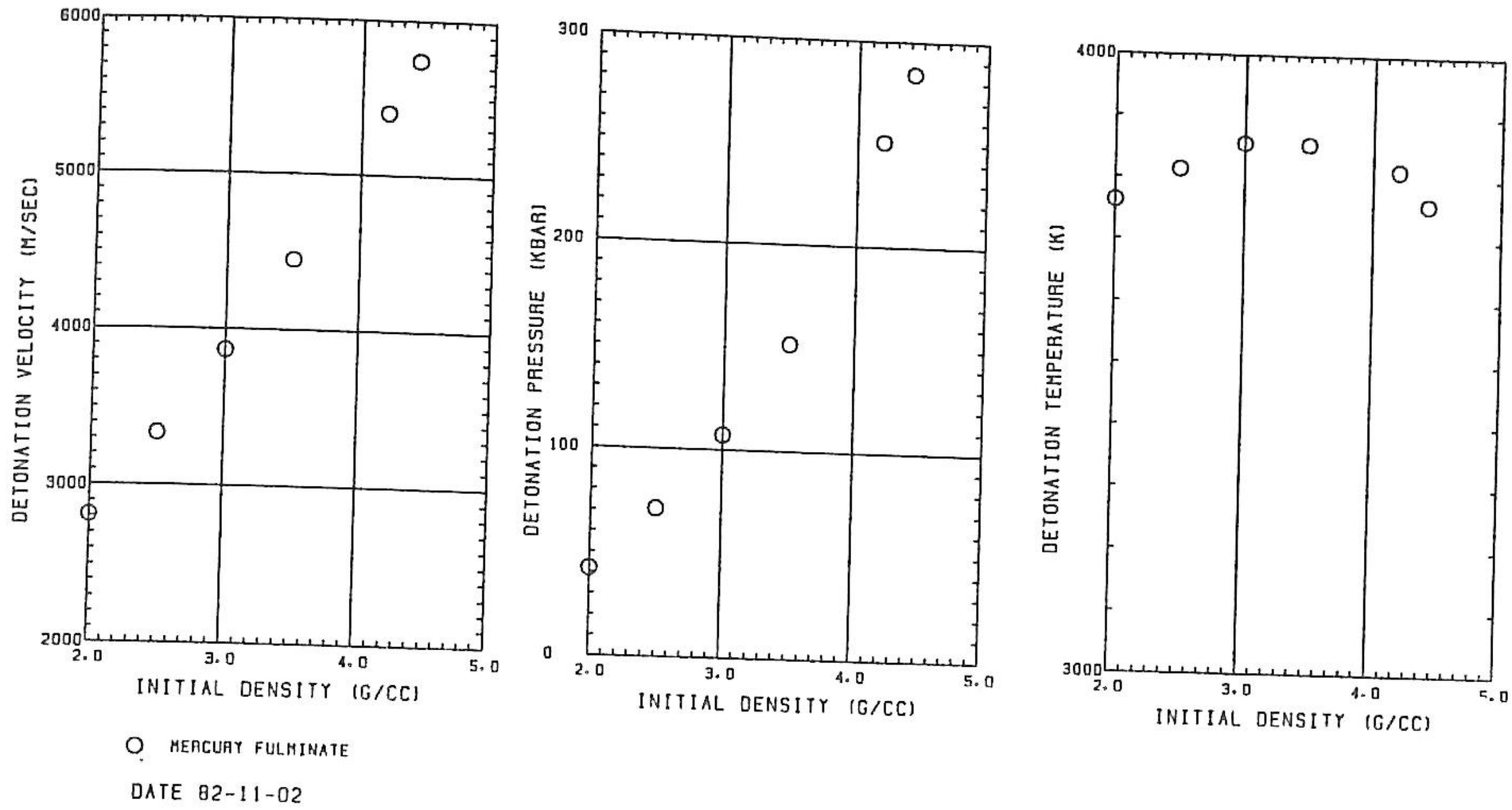
HMX/EXON/W 55/10/35 VOL
RHO (G/CC) 7.900
E_0 (KCAL/MOLE) 1.13

DATE 82-11-02

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES	MERCURY FUL# MINATE	MERCURY FUL# MINATE	MERCURY FUL# MINATE	MERCURY FUL# MINATE	MERCURY FUL# MINATE	MERCURY FUL# MINATE
RHO (G/CC)	4.430	4.200	3.500	3.000	2.500	2.000
EO (KCAL/MOLE)	65.40	65.40	65.40	65.40	65.40	65.40
MOL.WEIGHT (G)	284.624	284.624	284.624	284.624	284.624	284.624
C	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
N	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
O	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
HG	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
DETN.VEL (M/SEC)	5739.7	5399.0	4450.6	3867.0	3333.3	2809.7
PARTICL.VEL(")	1117.6	1105.7	973.4	924.2	851.7	745.2
C-J PRESS (KBAR)	284.2	250.7	151.6	107.2	71.0	41.9
C-J VOLUME (CC/G)	0.18178	0.18933	0.22322	0.25367	0.29779	0.36739
C-J TEMP (DEG K)	3758.7	3813.9	3854.9	3855.8	3813.2	3762.0
C-J S(CAL/DEG MOL)	83.64	83.80	80.90	76.79	71.75	67.77
C-J ENERGY (CAL/G)	149.25	146.10	113.24	102.07	86.69	66.36
GAMMA	4.136	3.883	3.572	3.184	2.914	2.770
C-J DETN.HEAT(CAL)	554.3	551.6	531.1	505.2	471.4	439.7
LAMDA	11.7939	11.7357	11.3321	10.8988	10.4231	10.0499
VOLUM(K LITTRE/KG)	0.1747	0.1763	0.1888	0.2043	0.2245	0.2434
TOTAL PRODCT(MOLE)	4.0026	4.0025	4.0014	4.0009	4.0005	4.0002
V GAS (MOLES)	2.0319	2.0514	2.1968	2.3770	2.6119	2.8313
V GAS (CC/MOLE)	14.9319	15.6092	18.4709	20.6391	23.6671	28.8988
V SOL HG(L (CC/G)	0.09126	0.09306	0.09860	0.10209	0.10552	0.10931
V SOL C(S) (CC/G)	0.26538	0.28025	0.32912	0.35556	0.38089	0.40519
CO2 (MOL %)	24.1194	23.6395	20.0379	15.5496	9.6898	4.2125
CO (MOL %)	1.5961	2.5667	9.8368	18.8447	30.5912	41.5626
N2 (MOL %)	24.9220	24.9268	24.9578	24.9727	24.9855	24.9938
O2 (MOL %)	0.0045	0.0040	0.0015	0.0007	0.0002	0.0001
NO (MOL %)	0.1229	0.1155	0.0669	0.0434	0.0230	0.0099
HG(L) (MOL %)	24.9835	24.9846	24.9913	24.9944	24.9971	24.9988
C(S) (MOL %)	24.2515	23.7630	20.1078	15.5944	9.7132	4.2225

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

MERCURY FULMINATE RHO = 4.4300 G/CC EO = 6.540000E+04 CAL/MOLE

LN P = -5.92455578 E+00 -1.87388325 E+00LN V 3.63166690 E-01LN V*2 -7.64898062 E-02LN V*3 5.74411452 E-03LN V*4

LN T = 7.57223034 E+00 -2.30704010 E-01LN V 6.79122210 E-02LN V*2 -1.51745006 E-02LN V*3 1.22109917 E-03LN V*4

LN E = -2.06519222 E+00 1.63938642 E-01LNP 2.82996483 E-02LN P*2 2.27531046 E-03LN P*3 6.68438006 E-05LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (590.142)	0.1522	4361.7 (4288.9)	-461.8	0.11932 (0.11744)	4.2078	151.0
500.000 (491.114)	0.1591	4176.7 (4163.7)	-362.2	0.11515 (0.11464)	4.1276	417.3
400.000 (397.198)	0.1676	3996.2 (4024.1)	-265.6	0.11111 (0.11154)	4.0348	711.5
300.000 (302.641)	0.1794	3794.7 (3853.1)	-165.8	0.10694 (0.10803)	3.9156	1056.3
* 284.159 (287.438)	0.1818	3758.7 (3821.7)	-149.1	0.10624 (0.10742)	3.8930	1117.6
200.000 (200.225)	0.1999	3628.2 (3609.2)	-76.9	0.10322 (0.10385)	3.7340	1513.7
100.000 (98.229)	0.2439	3294.0 (3230.3)	40.4	0.09831 (0.09842)	3.4199	2177.1
80.000 (78.137)	0.2611	3174.3 (3118.9)	71.6	0.09700 (0.09704)	3.3187	2362.5
60.000 (58.209)	0.2858	3021.9 (2982.4)	107.0	0.09552 (0.09547)	3.1886	2584.1
50.000 (48.366)	0.3031	2928.0 (2900.4)	126.9	0.09469 (0.09460)	3.1067	2714.6
40.000 (38.581)	0.3264	2819.4 (2804.2)	148.6	0.09378 (0.09363)	3.0070	2865.3
30.000 (33.208)	0.3433	2687.1 (2742.6)	173.7	0.09273 (0.09254)	2.9408	2960.5
20.000 (21.640)	0.3991	2520.9 (2576.3)	202.8	0.09152 (0.09126)	2.7526	3213.4
10.000 (10.451)	0.5285	2287.9 (2324.2)	240.5	0.08994 (0.08962)	2.4364	3588.9
8.000 (8.281)	0.5826	2220.6 (2251.1)	251.0	0.08950 (0.08921)	2.3368	3697.2
6.000 (6.121)	0.6655	2141.7 (2161.3)	262.9	0.08900 (0.08874)	2.2092	3830.7
5.000 (5.053)	0.7270	2094.3 (2107.3)	270.0	0.08870 (0.08847)	2.1295	3911.6
4.000 (3.995)	0.8139	2039.0 (2044.2)	278.1	0.08836 (0.08817)	2.0334	4007.3
3.000 (2.954)	0.9486	1971.6 (1967.7)	287.9	0.08795 (0.08782)	1.9129	4125.4
2.000 (1.938)	1.1940	1883.0 (1869.4)	300.6	0.08742 (0.08738)	1.7522	4282.4
1.000 (0.961)	1.8391	1746.3 (1726.1)	320.1	0.08661 (0.08672)	1.5113	4529.3
0.800 (0.769)	2.1371	1706.1 (1685.7)	325.9	0.08636 (0.08652)	1.4446	4604.6
0.600 (0,580)	2.6140	1656.1 (1637.3)	333.2	0.08606 (0.08626)	1.3674	4699.4
0.500 (0.485)	2.9833	1625.1 (1608.6)	337.7	0.08587 (0.08609)	1.3241	4758.4
0.400 (0.391)	3.5252	1588.6 (1575.1)	343.2	0.08564 (0.08588)	1.2771	4829.9
0.300 (0.296)	4.4049	1543.2 (1534.4)	350.0	0.08536 (0.08561)	1.2265	4921.1
0.200 (0.200)	6.1062	1482.2 (1480.8)	359.5	0.08496 (0.08521)	1.1748	5048.0
0.100 (0.102)	10.9414	1386.6 (1395.8)	375.0	0.08431 (0.08449)	1.1350	5261.6
0.080 (0.082)	13.2601	1358.1 (1369.4)	379.9	0.08411 (0.08424)	1.1328	5329.6
0.060 (0.062)	17.0314	1323.2 (1335.6)	385.9	0.08385 (0.08393)	1.1355	5416.8
0.050 (0.052)	19.9763	1301.9 (1314.3)	389.7	0.08370 (0.08373)	1.1396	5471.8
0.040 (0.041)	24.3074	1276.8 (1288.4)	394.2	0.08351 (0.08348)	1.1462	5538.7
0.030 (0.031)	31.3425	1246.0 (1255.2)	399.8	0.08327 (0.08317)	1.1556	5624.2
0.020 (0.020)	44.9255	1205.0 (1209.1)	407.5	0.08295 (0.08275)	1.1667	5743.0
0.010 (0.010)	83.4453	1140.9 (1135.2)	420.0	0.08243 (0.08214)	1.1623	5939.8
0.008 (0.008)	101.8308	1121.3 (1113.8)	424.0	0.08226 (0.08199)	1.1501	6000.7
0.006 (0.006)	132.0257	1098.0 (1088.4)	428.6	0.08207 (0.08183)	1.1235	6078.1
0.005 (0.005)	155.5878	1083.5 (1074.1)	431.6	0.08194 (0.08176)	1.0993	6125.8
0.004 (0.004)	190.2737	1066.2 (1058.7)	435.1	0.08179 (0.08171)	1.0610	6183.0
0.003 (0.003)	246.7514	1044.8 (1043.2)	439.6	0.08161 (0.08171)	0.9954	6254.6
0.002 (0.002)	356.2078	1015.9 (1031.2)	445.8	0.08135 (0.08187)	0.8676	6351.3

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

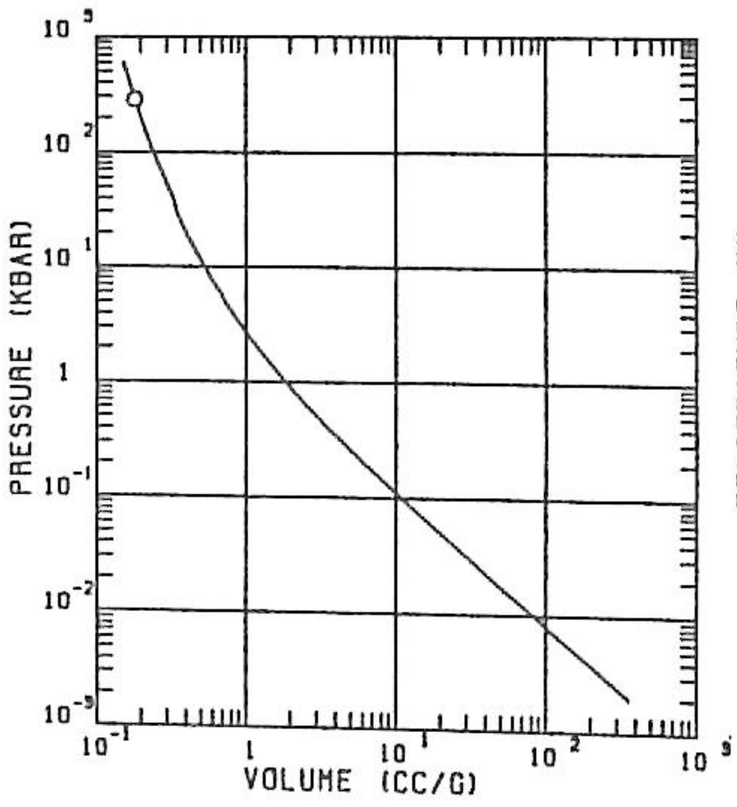
MERCURY FULMINATE RHO = 4.4300 G/CC EO = 6.540000E+04 CAL/MOLE

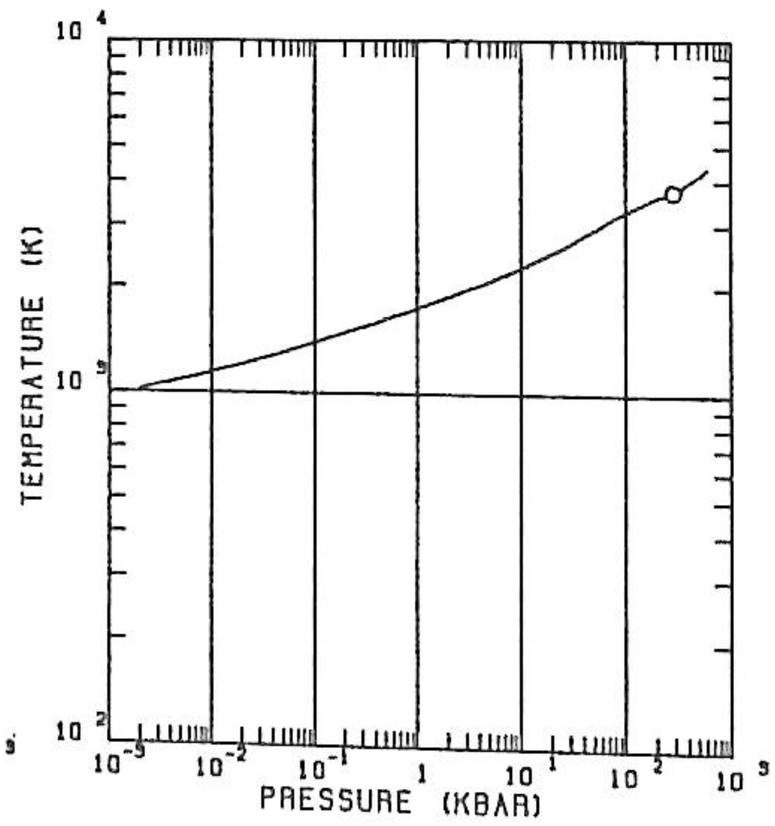
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

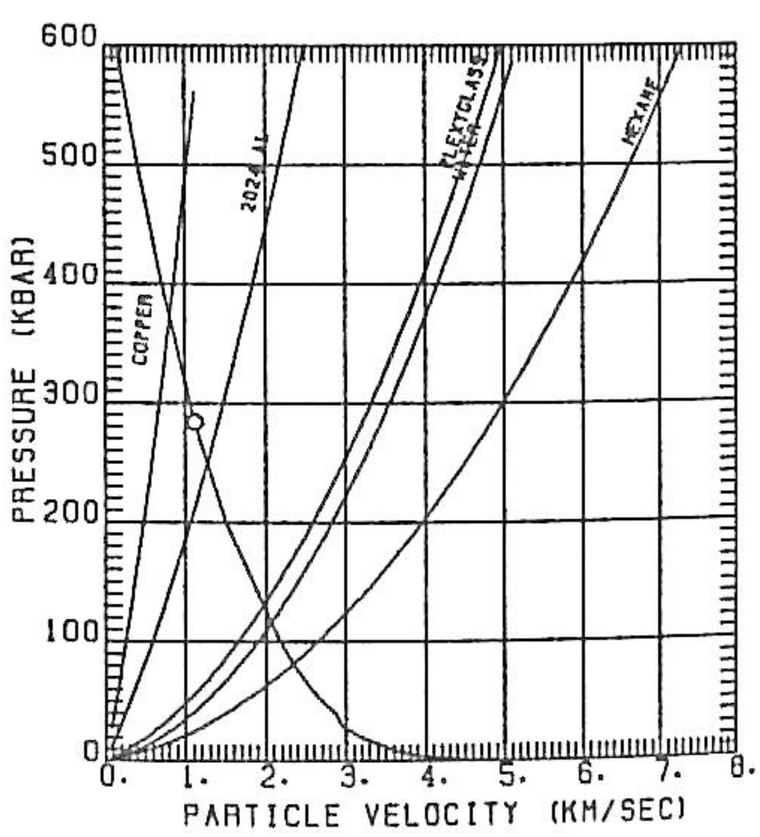
PRESS	CO2	CO	N2	O2	NO	HG(L)	C(S)
284.159	0.96528	0.06416	0.99755	0.00018	0.00491	1.00000	0.97055
200.000	0.92495	0.14756	0.99879	0.00006	0.00241	1.00000	0.92749
100.000	0.77018	0.45915	0.99976	0.00001	0.00047	1.00000	0.77067
80.000	0.70715	0.58543	0.99987	0.00000	0.00026	1.00000	0.70742
60.000	0.62431	0.75126	0.99994	0.00000	0.00012	1.00000	0.62443
50.000	0.57405	0.85183	0.99996	0.00000	0.00007	1.00000	0.57412
40.000	0.51586	0.96825	0.99998	0.00000	0.00004	1.00000	0.51590
30.000	0.45369	1.09262	0.99999	0.00000	0.00002	1.00000	0.45369
20.000	0.37698	1.24606	1.00000	0.00000	0.00001	1.00000	0.37696
10.000	0.28884	1.42234	1.00000	0.00000	0.00000	1.00000	0.28882
8.000	0.27197	1.45607	1.00000	0.00000	0.00000	1.00000	0.27195
6.000	0.25429	1.49145	1.00000	0.00000	0.00000	1.00000	0.25426
5.000	0.24616	1.50771	1.00000	0.00000	0.00000	1.00000	0.24613
4.000	0.23861	1.52281	1.00000	0.00000	0.00000	1.00000	0.23858
3.000	0.23259	1.53484	1.00000	0.00000	0.00000	1.00000	0.23257
2.000	0.23001	1.54000	1.00000	0.00000	0.00000	1.00000	0.22998
1.000	0.23864	1.52275	1.00000	0.00000	0.00000	1.00000	0.23861
0.800	0.24379	1.51247	1.00000	0.00000	0.00000	1.00000	0.24374
0.600	0.25262	1.49480	1.00000	0.00000	0.00000	1.00000	0.25258
0.500	0.25963	1.48081	1.00000	0.00000	0.00000	1.00000	0.25956
0.400	0.26884	1.46241	1.00000	0.00000	0.00000	1.00000	0.26875
0.300	0.28222	1.43563	1.00000	0.00000	0.00000	1.00000	0.28215
0.200	0.30377	1.39250	1.00000	0.00000	0.00000	1.00000	0.30373
0.100	0.34604	1.30800	1.00000	0.00000	0.00000	1.00000	0.34596
0.080	0.36067	1.27875	1.00000	0.00000	0.00000	1.00000	0.36058
0.060	0.37946	1.24117	1.00000	0.00000	0.00000	1.00000	0.37938
0.050	0.39174	1.21658	1.00000	0.00000	0.00000	1.00000	0.39168
0.040	0.40662	1.18683	1.00000	0.00000	0.00000	1.00000	0.40656
0.030	0.42586	1.14836	1.00001	0.00000	0.00000	1.00000	0.42578
0.020	0.45293	1.09422	1.00001	0.00000	0.00000	1.00000	0.45285
0.010	0.49878	1.00252	1.00001	0.00000	0.00000	1.00000	0.49870
0.008	0.51478	0.97050	1.00001	0.00000	0.00000	1.00000	0.51471
0.006	0.53180	0.93648	1.00001	0.00000	0.00000	1.00000	0.53172
0.005	0.54338	0.91331	1.00001	0.00000	0.00000	1.00000	0.54330
0.004	0.55741	0.88525	1.00001	0.00000	0.00000	1.00000	0.55735
0.003	0.57525	0.84958	1.00001	0.00000	0.00000	1.00000	0.57518
0.002	0.59993	0.80023	1.00001	0.00000	0.00000	1.00000	0.59985
300.000	0.96845	0.05702	0.99718	0.00022	0.00564	1.00000	0.97453
400.000	0.97853	0.03021	0.99425	0.00061	0.01150	1.00000	0.99126
500.000	0.97976	0.01881	0.99039	0.00123	0.01922	1.00000	1.00143
600.000	0.97781	0.01495	0.98695	0.00166	0.02610	1.00000	1.00723

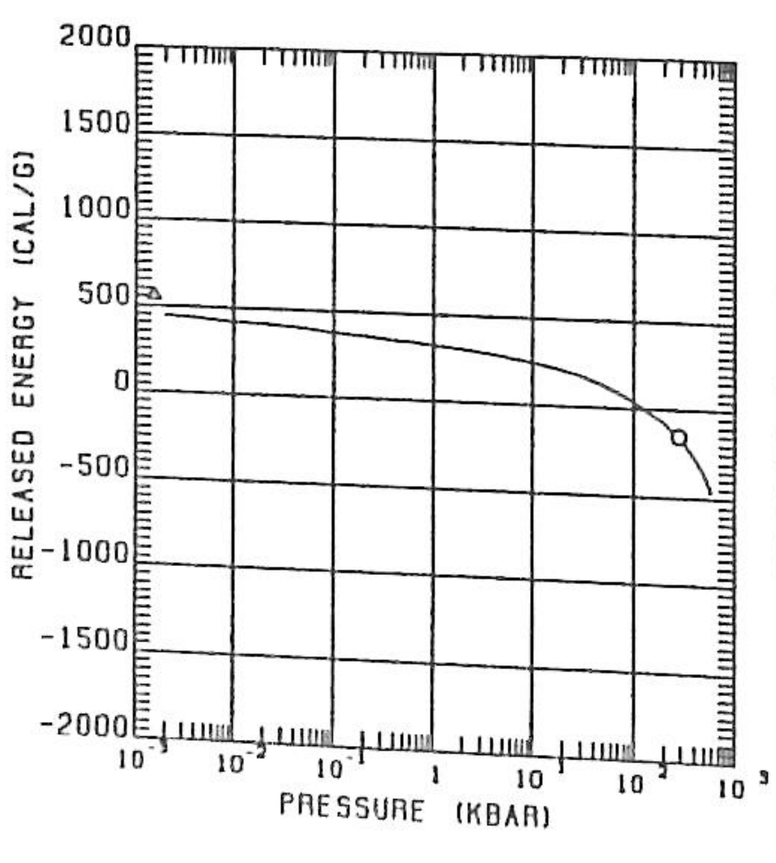
PRESS ;KBAR, PRODUCTS ;MOLES

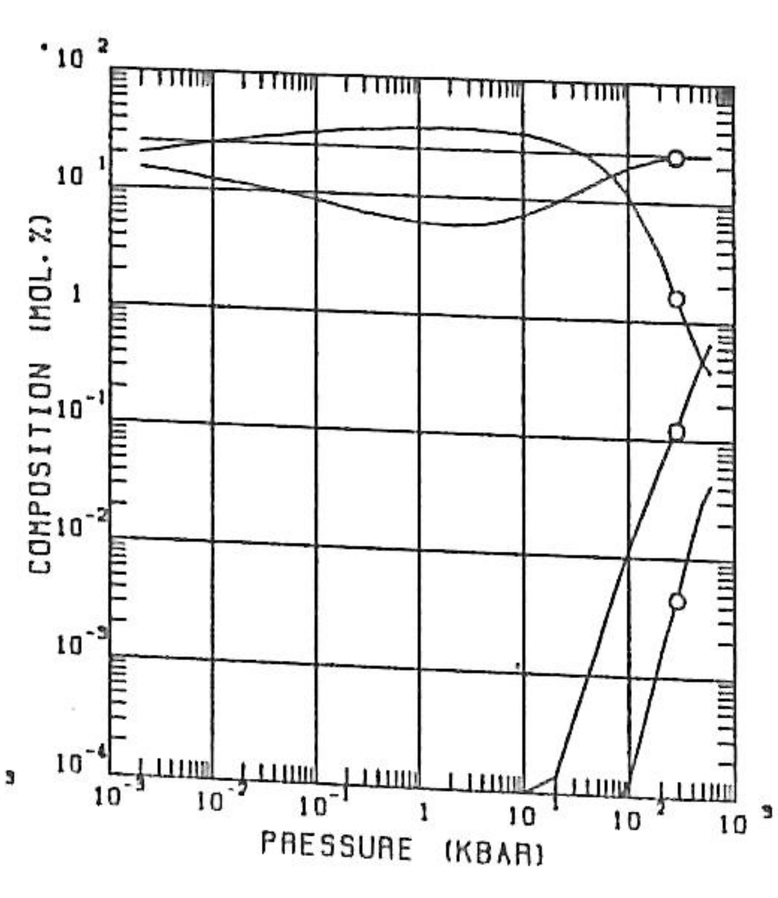
K-H-T ISENTROPE THRU C-J POINT











MERCURY FULMINATE

RHO (G/CC)	4.430
E_0 (KCAL/MOLE)	65.40
D_{C-J}(M/SEC)	5740.
P_{C-J}(KBAR)	284.2
T_{C-J}(K)	3759.

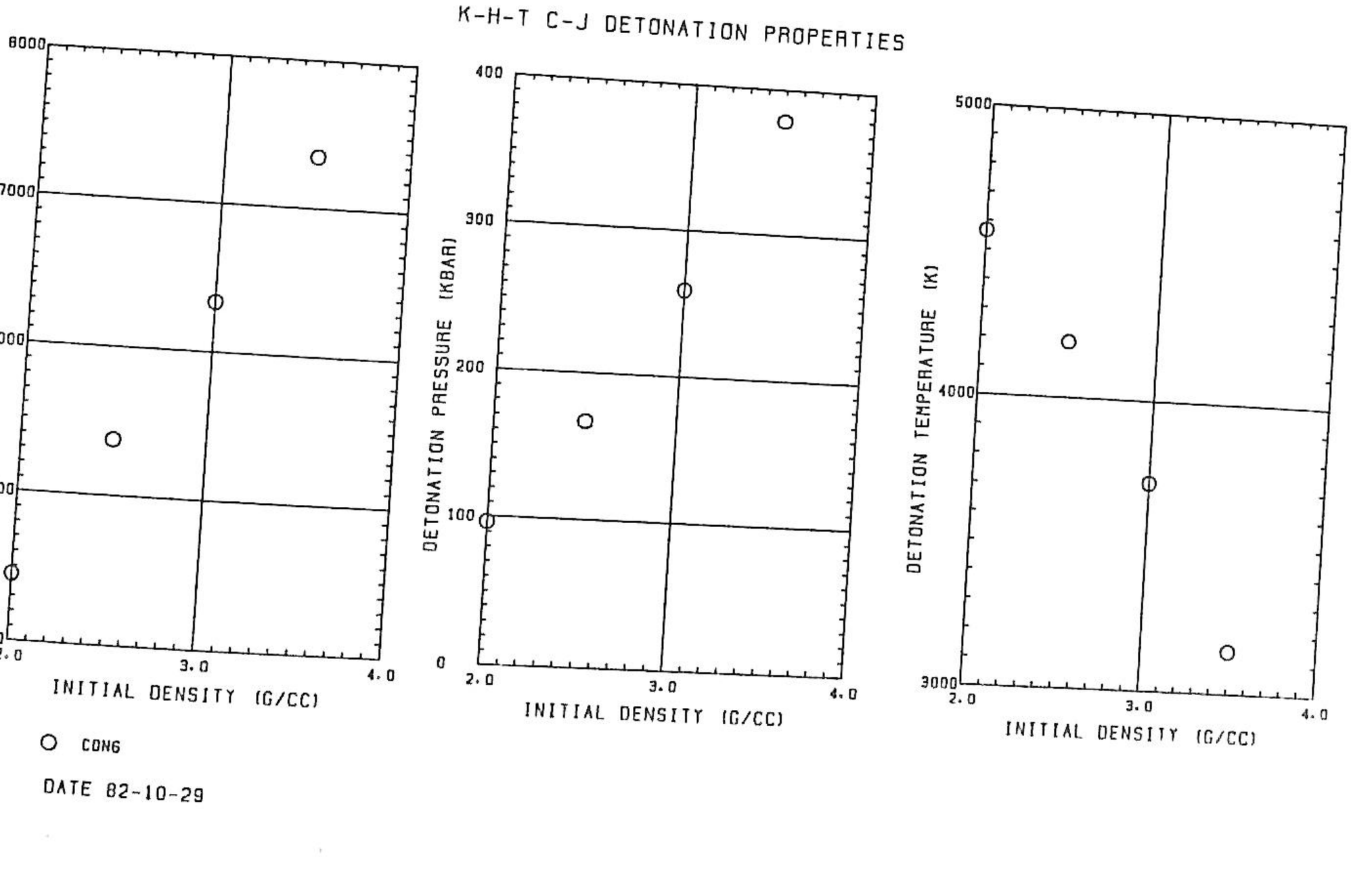
DATE 82-11-02

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

EXPLOSIVES	CADMIUM AZIDE CDN6	#CADMIUM AZIDE CDN6	#CADMIUM AZIDE CDN6	#CADMIUM AZIDE CDN6 #
RHO (G/CC)	3.500	3.000	2.500	2.000
EO (KCAL/MOLE)	115.50	115.50	115.50	115.50
MOL.WEIGHT (G)	196.440	196.440	196.440	196.440
CD	1.0000	1.0000	1.0000	1.0000
N	6.0000	6.0000	6.0000	6.0000
DETN.VEL (M/SEC)	7349.0	6335.9	5377.1	4442.0
PARTICL.VEL(")	1470.8	1363.9	1242.9	1084.1
C-J PRESS (KBAR)	378.3	259.2	167.1	96.3
C-J VOLUME (CC/G)	0.22853	0.26158	0.30754	0.37798
C-J TEMP (DEG K)	3145.9	3716.8	4192.4	4565.2
C-J S(CAL/DEG MOL)	50.42	52.78	54.66	56.22
C-J ENERGY (CAL/G)	258.50	222.29	184.59	140.44
GAMMA	3.997	3.646	3.326	3.098
C-J DETN.HEAT(CAL)	588.0	588.0	588.0	588.0
LAMDA	9.8000	9.8000	9.8000	9.8000
VOLUM(K LITTRE/KG)	0.3736	0.3736	0.3736	0.3736
TOTAL PRODCT(MOLE)	4.0000	4.0000	4.0000	4.0000
V GAS (MOLES)	3.0000	3.0000	3.0000	3.0000
V GAS (CC/MOLE)	11.7078	13.7015	16.5224	20.9246
V SOL CD(S (CC/G)	0.08692	0.09146	0.09650	0.10210
N2 (MOL %)	75.0000	75.0000	75.0000	75.0000
CD(S) (MOL %)	25.0000	25.0000	25.0000	25.0000

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES



○ CDN6

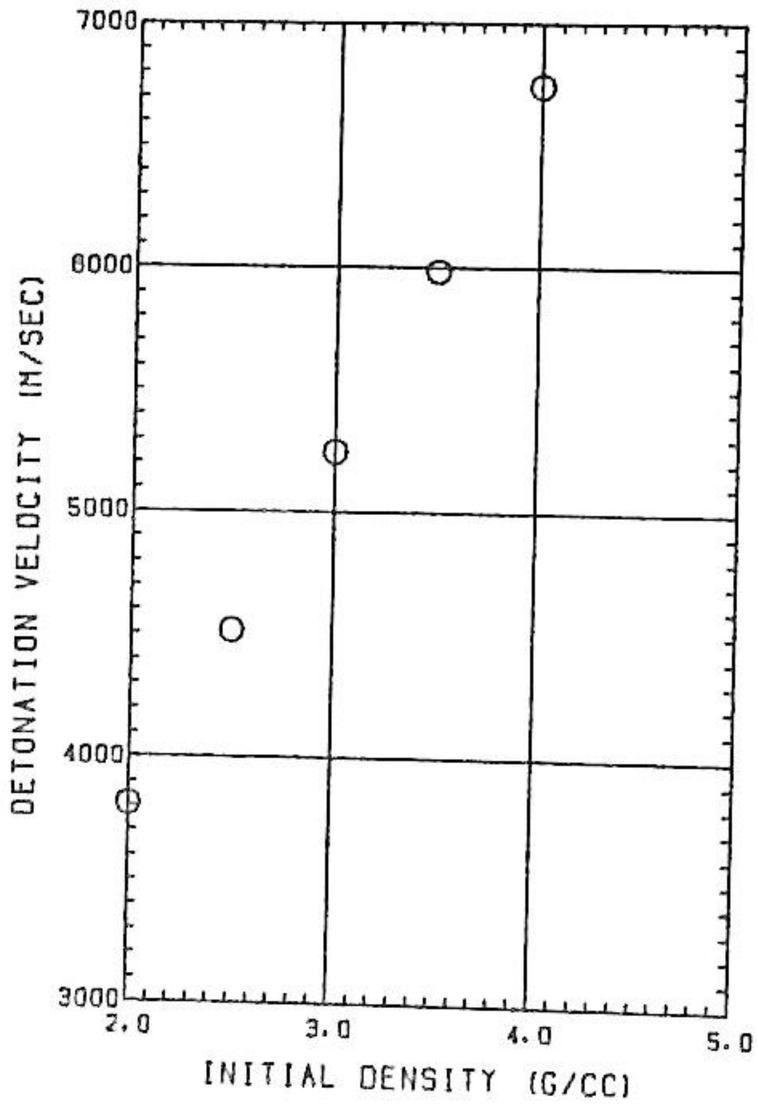
DATE 82-10-29

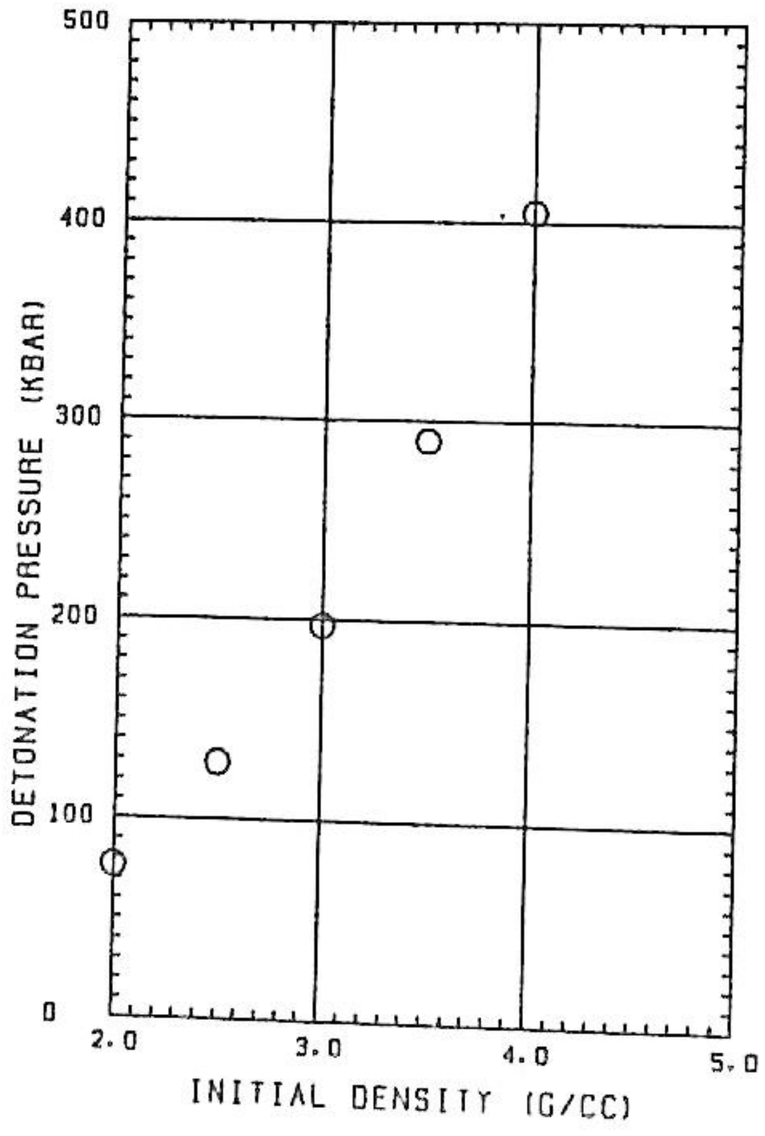
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-29>> **********

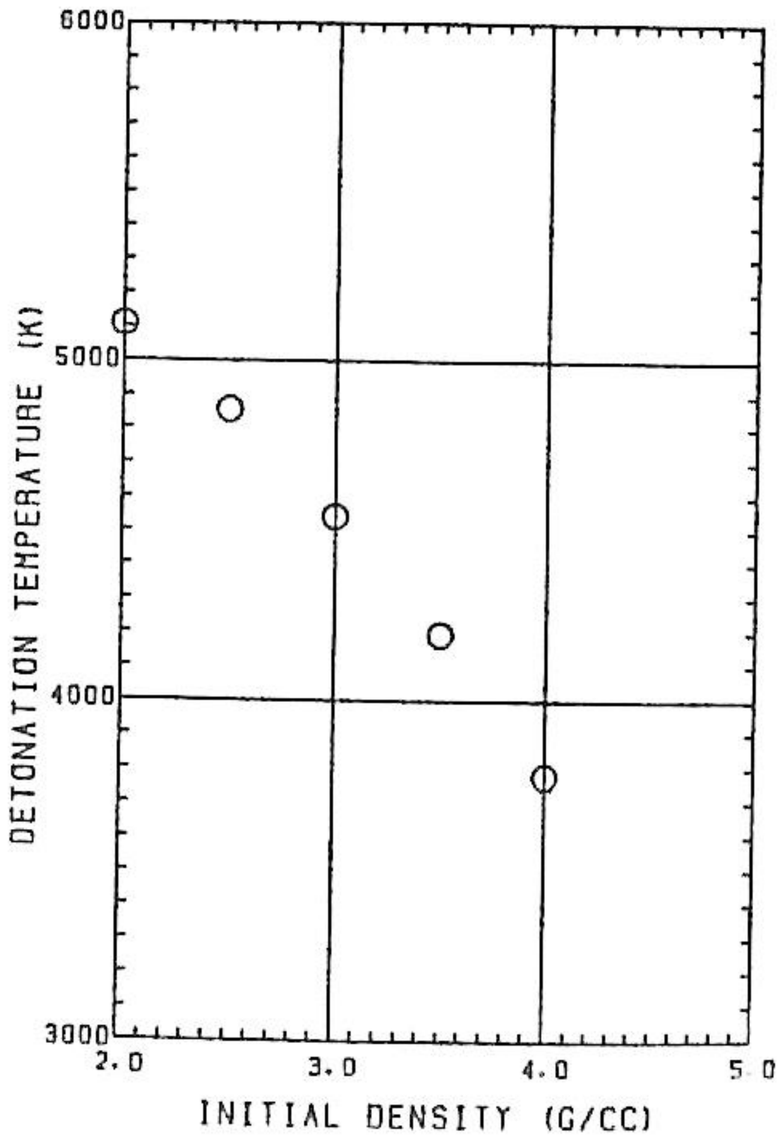
EXPLOSIVES	CUPRIC AZIDE# CU(N3)2	CUPRIC AZIDE# CU(N3)2	CUPRIC AZIDE# CU(N3)2	CUPRIC AZIDE# CU(N3)2	CUPRIC AZIDE# CU(N3)2
RHO (G/CC)	4.000	3.500	3.000	2.500	2.000
EO (KCAL/MOLE)	140.40	140.40	140.40	140.40	140.40
MOL.WEIGHT (G)	211.120	211.120	211.120	211.120	211.120
CU	1.0000	1.0000	1.0000	1.0000	1.0000
N	6.0000	6.0000	6.0000	6.0000	6.0000
DETN.VEL (M/SEC)	6742.4	5983.7	5244.7	4514.0	3806.7
PARTICL.VEL(")	1501.9	1387.1	1253.8	1135.4	1004.8
C-J PRESS (KBAR)	405.0	290.5	197.3	128.1	76.5
C-J VOLUME (CC/G)	0.19431	0.21948	0.25364	0.29939	0.36803
C-J TEMP (DEG K)	3779.1	4193.5	4540.5	4853.4	5107.9
C-J S(CAL/DEG MOL)	52.21	53.99	55.50	56.85	58.08
C-J ENERGY (CAL/G)	269.56	229.92	187.87	154.05	120.65
GAMMA	3.489	3.314	3.183	2.976	2.789
C-J DETN.HEAT(CAL)	665.0	665.0	665.0	665.0	665.0
LAMDA	9.8000	9.8000	9.8000	9.8000	9.8000
VOLUM(K LITTRE/KG)	0.3476	0.3476	0.3476	0.3476	0.3476
TOTAL PRODCT(MOLE)	4.0000	4.0000	4.0000	4.0000	4.0000
V GAS (MOLES)	3.0000	3.0000	3.0000	3.0000	3.0000
V GAS (CC/MOLE)	11.6960	13.3927	15.7211	18.8715	23.6403
V SOL CU(S (CC/G)	0.09341	0.09693	0.10051	0.10376	0.10666
N2 (MOL %)	75.0000	75.0000	75.0000	75.0000	75.0000
CU(S) (MOL %)	25.0000	25.0000	25.0000	25.0000	25.0000

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES







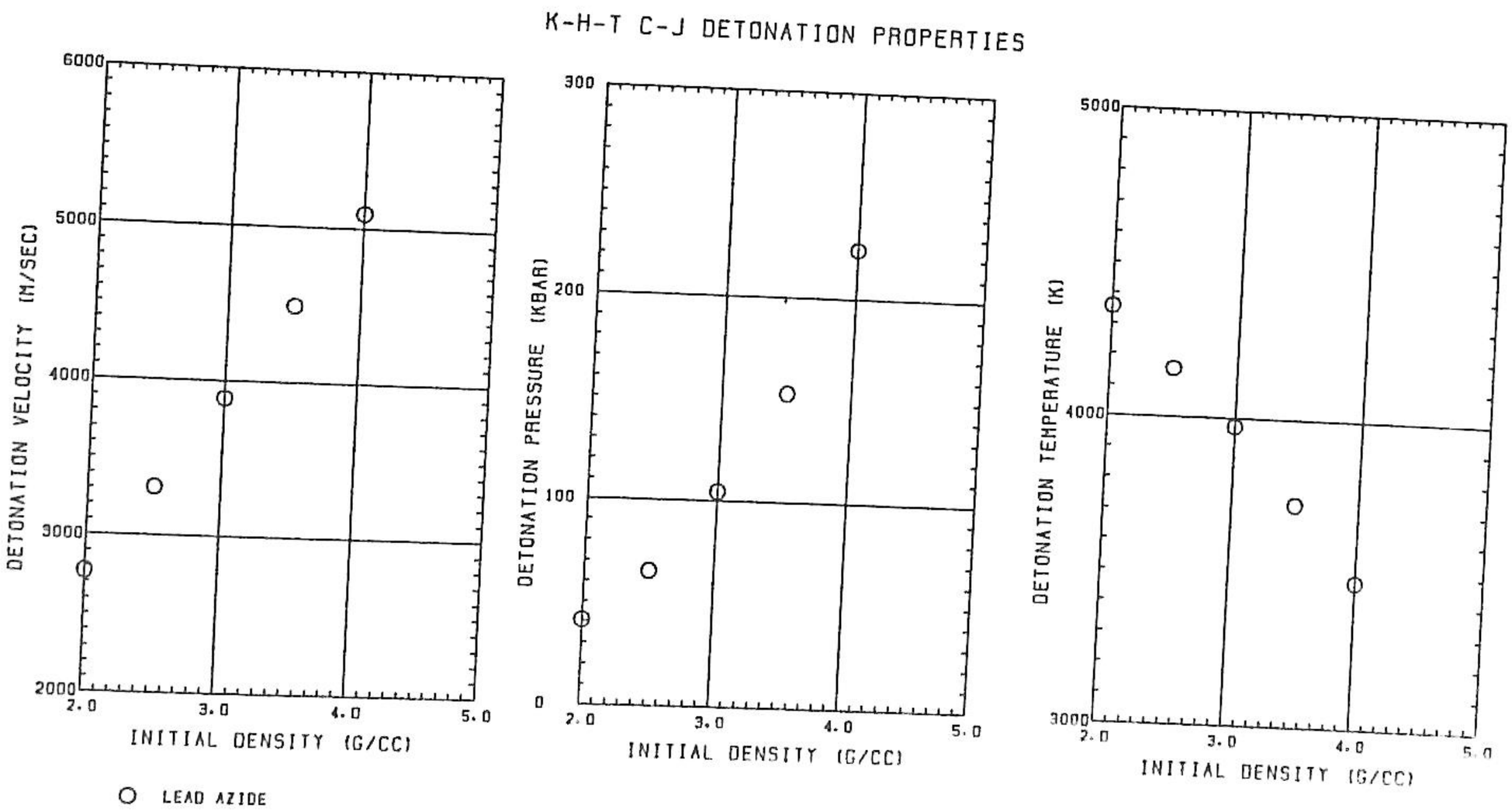
O CUPRIC AZIDE CU(N3)2

DATE 82-10-29

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-26>> **********

EXPLOSIVES	LEAD AZIDE #	LEAD AZIDE #	LEAD AZIDE #	LEAD AZIDE #	LEAD AZIDE #
RHO (G/CC)	4.000	3.500	3.000	2.500	2.000
EO (KCAL/MOLE)	113.98	113.98	113.98	113.98	113.98
MOL.WEIGHT (G)	291.230	291.230	291.230	291.230	291.230
PB	1.0000	1.0000	1.0000	1.0000	1.0000
N	6.0000	6.0000	6.0000	6.0000	6.0000
DETN.VEL (M/SEC)	5098.2	4491.6	3887.2	3309.4	2767.7
PARTICL.VEL(")	1098.6	973.9	895.1	786.5	735.7
C-J PRESS (KBAR)	224.0	153.1	104.4	65.1	40.7
C-J VOLUME (CC/G)	0.19613	0.22376	0.25658	0.30494	0.36709
C-J TEMP (DEG K)	3475.1	3722.2	3971.7	4157.0	4355.3
C-J S(CAL/DEG MOL)	55.53	56.90	58.14	59.24	60.32
C-J ENERGY (CAL/G)	144.24	113.34	95.74	73.92	64.68
GAMMA	3.640	3.612	3.343	3.208	2.762
C-J DETN.HEAT(CAL)	391.4	391.4	391.4	391.4	391.4
LAMDA	9.8000	9.8000	9.8000	9.8000	9.8000
VOLUM(K LITTRE/KG)	0.2520	0.2520	0.2520	0.2520	0.2520
TOTAL PRODCT(MOLE)	4.0000	4.0000	4.0000	4.0000	4.0000
V GAS (MOLES)	3.0000	3.0000	3.0000	3.0000	3.0000
V GAS (CC/MOLE)	14.2894	16.7206	19.6762	24.1300	29.9757
V SOL PB(S (CC/G)	0.06878	0.07242	0.07575	0.07924	0.08196
N2 (MOL %)	75.0000	75.0000	75.0000	75.0000	75.0000
PB(S) (MOL %)	25.0000	25.0000	25.0000	25.0000	25.0000

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-26>> **********

LEAD AZIDE RHO = 4.0000 G/CC EO = 1.139800E+05 CAL/MOLE

LN P = -5.76844692 E+00 -1.90557098 E+00LN V 3.23170304 E-01LN V*2 -6.67139888 E-02LN V*3 4.88482788 E-03LN V*4

LN T = 7.61544132 E+00 -2.40612149 E-01LN V 4.68760543 E-02LN V*2 -1.78421028 E-02LN V*3 1.78461522 E-03LN V*4

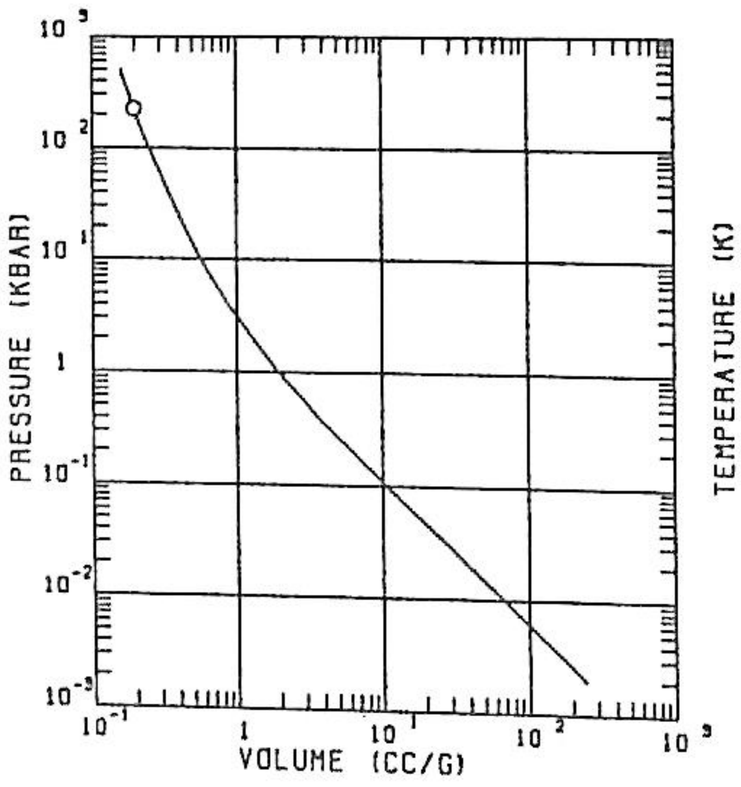
LN E = -2.03798103 E+00   1.68367267 E-01LNP 2.98055336 E-02LN P*2 2.45012296 E-03LN P*3 7.36882648 E-05LN P*4

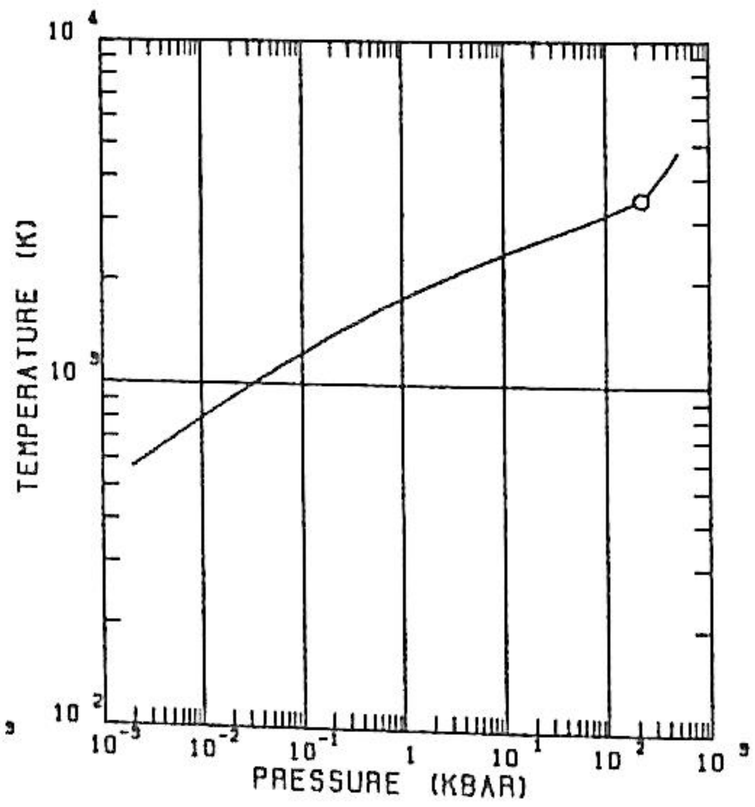
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

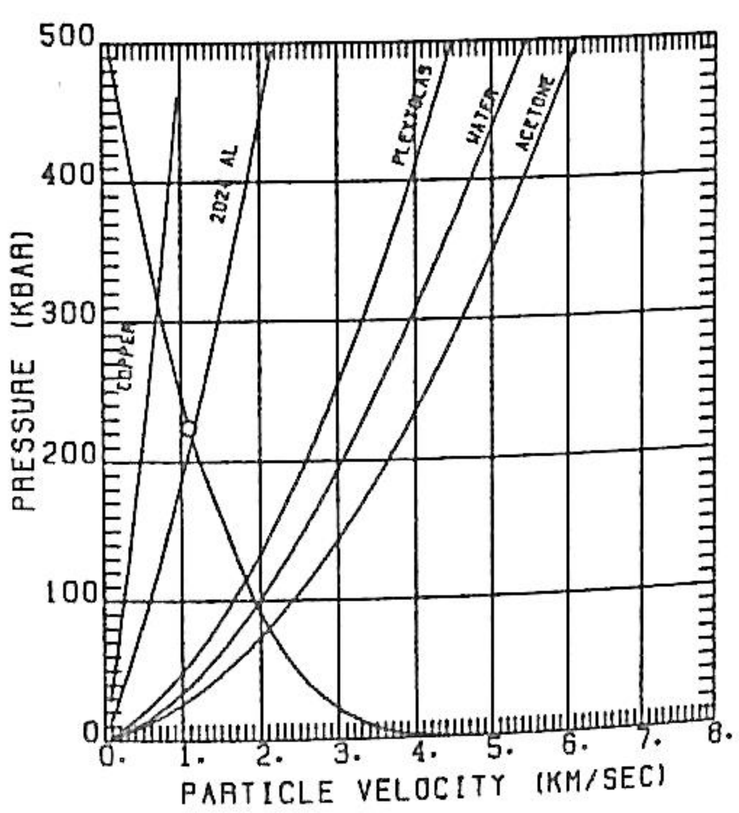
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

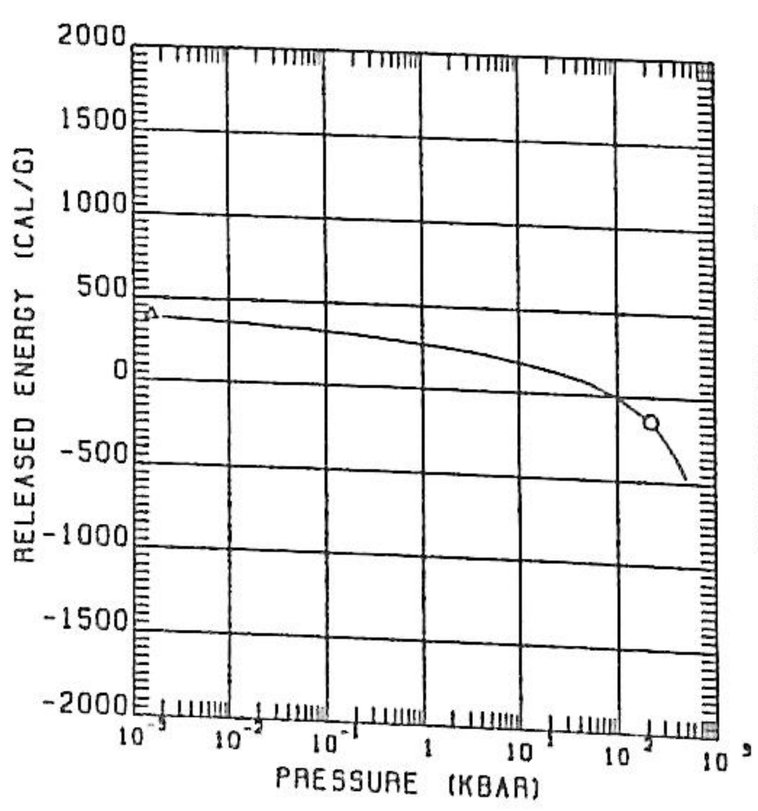
PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (501.241)	0.1586	4795.4 (4227.8)	-469.1	0.11963 (0.11752)	3.8965	80.7
400.000 (402.725)	0.1679	4310.6 (4079.3)	-355.1	0.11486 (0.11428)	3.8076	393.3
300.000 (302.259)	0.1812	3844.6 (3894.5)	-237.7	0.10995 (0.11063)	3.6909	761.9
* 224.040 (225.534)	0.1964	3475.1 (3716.9)	-141.5	0.10592 (0.10742)	3.5718	1098.6
200.000 (200.898)	0.2029	3430.1 (3649.6)	-121.4	0.10508 (0.10630)	3.5248	1225.2
100.000 (98.046)	0.2510	3130.2 (3266.0)	-3.4	0.10014 (0.10071)	3.2332	1920.6
80.000 (78.612)	0.2690	3048.8 (3158.8)	24.3	0.09898 (0.09930)	3.1437	2107.5
60.000 (59.151)	0.2949	2947.7 (3027.7)	56.5	0.09764 (0.09772)	3.0287	2331.9
50.000 (49.386)	0.3133	2885.7 (2948.4)	74.9	0.09687 (0.09683)	2.9560	2465.6
40.000 (39.850)	0.3372	2813.7 (2857.8)	94.4	0.09605 (0.09586)	2.8698	2616.5
30.000 (29.408)	0.3757	2724.5 (2736!0)	117.1	0.09510 (0.09476)	2.7483	2816.7
20.000 (20.062)	0.4336	2603.3 (2592.9)	144.4	0.09396 (0.09349)	2.5969	3048.3
10.000 (10.246)	0.5695	2401.6 (2366.4)	182.3	0.09237 (0.09187)	2.3363	3409.5
8.000 (8.209)	0.6273	2338.1 (2297.9)	192.7	0.09194 (0.09146)	2.2525	3517.8
6.000 (6.142)	0.7158	2256.4 (2212.4)	205.1	0.09142 (0.09101)	2.1448	3652.7
5.000 (5.102)	0.7815	2204.6 (2160.0)	212.6	0.09111 (0.09075)	2.0773	3735.3
4.000 (4.059)	0.8744	2142.3 (2097.7)	221.2	0.09075 (0.09046)	1.9959	3833.6
3.000 (3.019)	1.0182	2063.0 (2020.5)	231.6	0.09031 (0.09012)	1.8940	3955.6
2.000 (1.990)	1.2796	1954.4 (1917.4)	245.2	0.08974 (0.08969)	1.7581	4118.7
1.000 (0.985)	1.9591	1773.6 (1754.2)	266.1	0.08887 (0.08905)	1.5555	4375.9
0.800 (0.787)	2.2694	1718.3 (1704.0)	272.2	0.08861 (0.08884)	1.4995	4454.1
0.600 (0.590)	2.7614	1647.0 (1640.3)	279.8	0.08829 (0.08858)	1.4351	4552.2
0.500 (0.492)	3.1383	1601.6 (1600.3)	284.6	0.08809 (0.08841)	1.3989	4612.9
0.400 (0.394)	3.6851	1547.0 (1551.4)	290.2	0.08786 (0.08821)	1.3597	4685.8
0.300 (0.297)	4.5595	1477.7 (1488.4)	297.2	0.08757 (0.08793)	1.3174	4778.0
0.200 (0.199)	6.2096	1381.5 (1399.1)	306.6	0.08717 (0.08752)	1.2737	4904.3
0.100 (0.101)	10.6936	1222.4 (1245.6)	321.6	0.08654 (0.08678)	1.2378	5110.8
0.080 (0.081)	12.7970	1176.7 (1195.7)	325.9	0.08637 (0.08654)	1.2348	5175.6
0.060 (0.061)	16.1168	1116.8 (1132.4)	331.3	0.08614 (0.08622)	1.2357	5256.9
0.050 (0.051)	18.6598	1079.7 (1092.8)	334.7	0.08600 (0.08602)	1.2384	5307.4
0.040 (0.041)	22.3298	1035.9 (1045.0)	338.6	0.08583 (0.08578)	1.2434	5368.2
0.030 (0.030)	28.1467	981.3 (985.0)	343.4	0.08563 (0.08549)	1.2514	5444.9
0.020 (0.020)	38.9878	907.8 (904.5)	349.7	0.08537 (0.08510)	1.2631	5549.5
0.010 (0.010)	67.8329	790.4 (781.1)	359.6	0.08496 (0.08458)	1.2738	5718.1
0.008 (0.008)	81.2462	758.1 (745.4)	362.2	0.08485 (0.08448)	1.2720	5770.4
0.006 (0.006)	102.1903	715.4 (703.7)	365.7	0.08470 (0.08439)	1.2643	5834.9
0.005 (0.005)	118.1536	689.4 (679.4)	367.8	0.08461 (0.08438)	1.2556	5874.6
0.004 (0.004)	141.0790	658.6 (652.3)	370.2	0.08451 (0.08441)	1.2404	5922.0
0.003 (0.003)	177.2268	620.7 (621.6)	373.2	0.08439 (0.08453)	1.2124	5980.9
0.002 (0.002)	244.1657	570.1 (587.0)	377.1	0.08422 (0.08490)	1.1546	6059.9

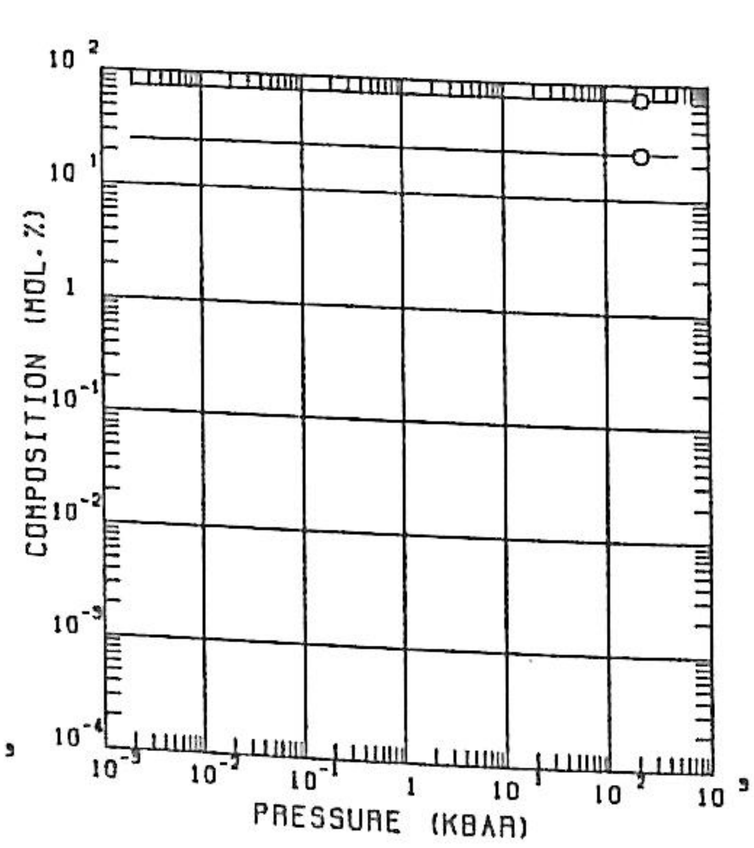
K-H-T ISENTROPE THRU C-J POINT











LEAD AZIDE	
RHO (G/CC)	4.000
E_0 (KCAL/MOLE)	113.98
D_{C-J} (M/SEC)	5098.
P_{C-J} (KBAR)	224.0
T_{C-J} (K)	3475.

DATE 82-10-26

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-26>> **********

LEAD AZIDE RHO = 3.5000 G/CC EQ = 1.139800E+05 CAL/MOLE

LN P = -5.66413593 E+00 -1.88063908 E+00LN V 3.23044121 E-01LN V*2 -6.79385066 E-02LN V*3 5.03238663 E-03LN V*4

LN T = 7.75051022 E+00 -2.40692377 E-01LN V 4.92750183 E-02LN V*2 -1.76403821 E-02LN V*3 1.69977499 E-03LN V*4

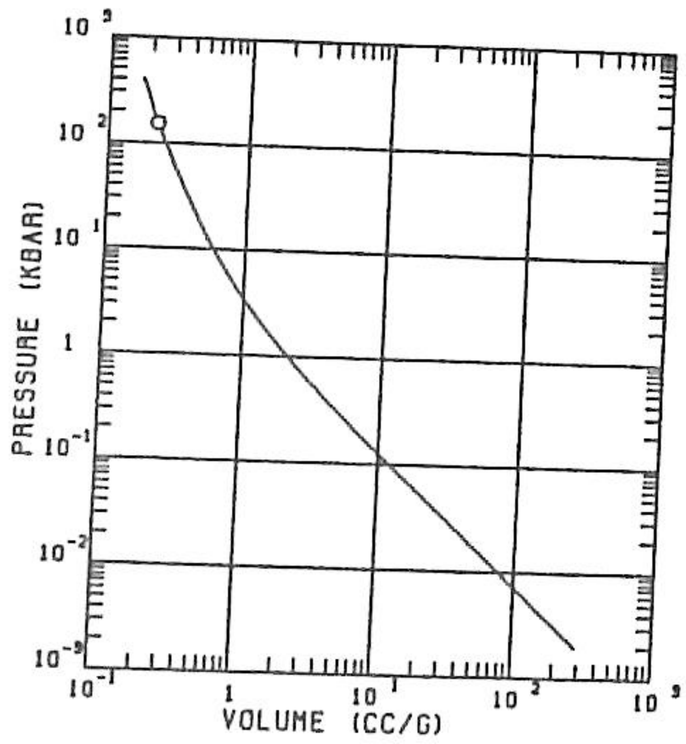
LN E = -2.00877953 E+00 1.73629463 E-01LNP 3.03792432 E-02LN P*2 2.48699426 E-03LN P*3 7.46166334 E-05LN P*4

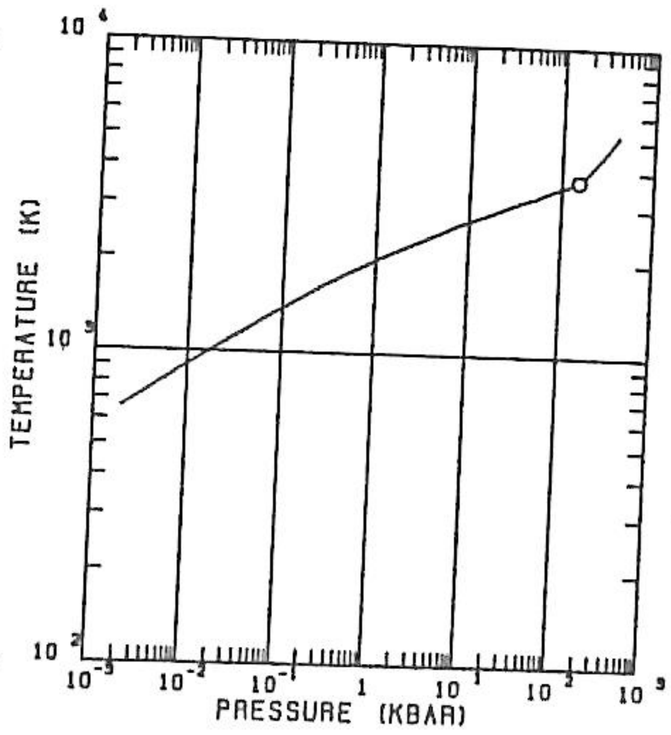
(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

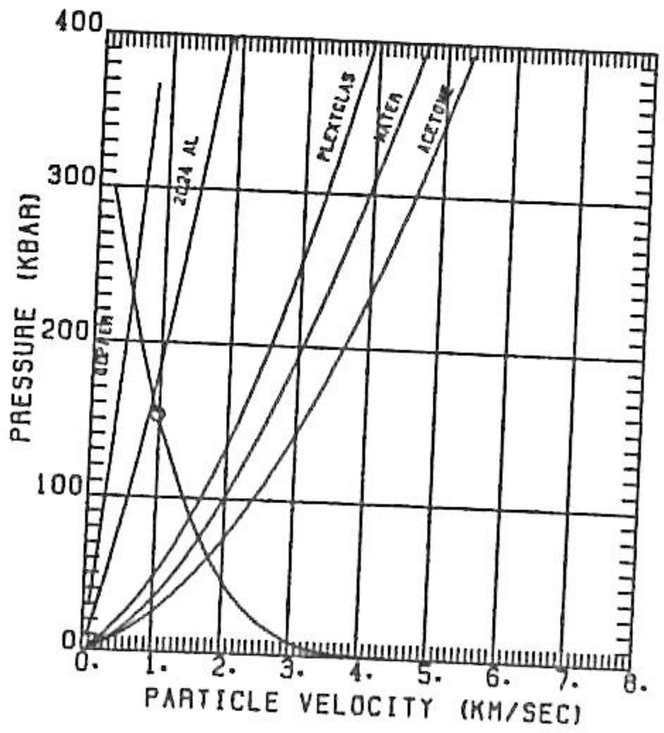
THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

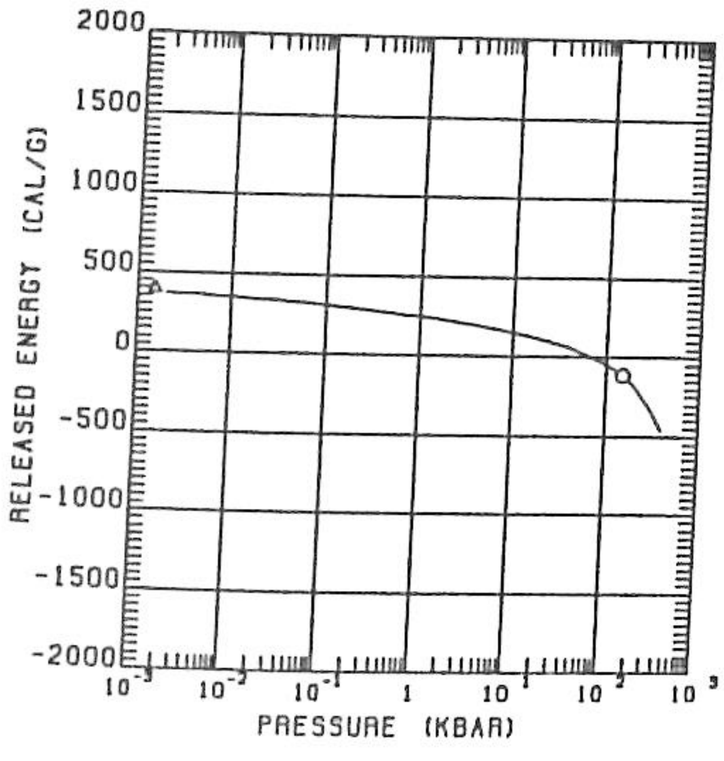
PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (394.293)	0.1719	5258.7 (4628.2)	-456.5	0.11910 (0.11716)	3.7606	0.0
300.000 (298.347)	0.1853	4621.1 (4422.9)	-321.7	0.11346 (0.11327)	3.6455	222.1
200.000 (200.554)	0.2071	4013.0 (4149.9)	-183.5	0.10768 (0.10867)	3.4815	694.7
* 153.101 (153.935)	0.2238	3722.2 (3980.0)	-113.3	0.10474 (0.10612)	3.3723	973.9
100.000 (99.643)	0.2555	3536.6 (3719.8)	-46.4	0.10194 (0.10272)	3.1930	1387.1
80.000 (79.715)	0.2743	3444.0 (3595.1)	-16.7	0.10070 (0.10121)	3.1012	1580.4
60.000 (59.915)	0.3012	3332.3 (3443.5)	16.9	0.09929 (0.09951)	2.9840	1811.1
50.000 (50.108)	0.3201	3263.4 (3352.9)	35.8	0.09850 (0.09855)	2.9109	1946.9
40.000 (40.278)	0.3454	3183.0 (3246.7)	56.7	0.09763 (0.09751)	2.8219	2104.6
30.000 (29.691)	0.3858	3083.7 (3106.1)	80.6	0.09663 (0.09632)	2.6983	2310.8
20.000 (20.180)	0.4470	2945.2 (2940.0)	109.8	0.09540 (0.09494)	2.5434	2551.3
10.000 (10.221)	0.5931	2714.8 (2676.7)	150.8	0.09369 (0.09316)	2.2767	2928.1
8.000 (8.167)	0.6557	2642.0 (2597.3)	162.1	0.09322 (0.09271)	2.1911	3041.4
6.000 (6.093)	0.7521	2548.7 (2498.6)	175.8	0.09264 (0.09220)	2.0817	3182.5
5.000 (5.054)	0.8240	2489.7 (2438.3)	184.0	0.09230 (0.09190)	2.0135	3268.8
4.000 (4.017)	0.9258	2418.9 (2367.0)	193.5	0.09190 (0.09158)	1.9317	3371.4
3.000 (2.987)	1.0839	2329.5 (2278.9)	205.1	0.09142 (0.09119)	1.8299	3498.6
2.000 (1.972)	1.3721	2206.5 (2161.9)	220.2	0.09079 (0.09070)	1.6960	3668.8
1.000 (0.980)	2.1281	2002.0 (1977.9)	243.7	0.08980 (0.08996)	1.5003	3938.1
0.800 (0.784)	2.4760	1939.4 (1921.4)	250.6	0.08952 (0.08973)	1.4474	4020.5
0.600 (0.589)	3.0296	1858.6 (1849.7)	259.2	0.08915 (0.08943)	1.3875	4124.1
0.500 (0.492)	3.4549	1807.1 (1804.9)	264.6	0.08893 (0.08924)	1.3545	4188.3
0.400 (0.395)	4.0736	1745.6 (1750.0)	271.0	0.08866 (0.08900)	1.3195	4265.7
0.300 (0.298)	5.0637	1667.2 (1679.4)	278.9	0.08833 (0.08869)	1.2830	4363.6
0.200 (0.200)	6.9357	1559.1 (1579.6)	289.7	0.08788 (0.08823)	1.2476	4498.0
0.100 (0.101)	12.0297	1381.5 (1408.5)	306.9	0.08716 (0.08742)	1.2248	4718.4
0.080 (0.081)	14.4214	1330.6 (1352.9)	311.7	0.08696 (0.08715)	1.2254	4787.8
0.060 (0.061)	18.1997	1264.2 (1282.5)	317.9	0.08670 (0.08680)	1.2302	4874.9
0.050 (0.051)	21.0963	1223.1 (1238.4)	321.7	0.08654 (0.08658)	1.2349	4929.1
0.040 (0.041)	25.2812	1174.5 (1185.2)	326.1	0.08635 (0.08632)	1.2418	4994.4
0.030 (0.030)	31.9229	1114.1 (1118.4)	331.6	0.08613 (0.08599)	1.2515	5076.7
0.020 (0.020)	44.3264	1032.8 (1028.7)	338.9	0.08582 (0.08556)	1.2638	5189.0
0.010 (0.010)	77.4340	902.6 (891.3)	350.2	0.08535 (0.08498)	1.2699	5369.8
0.008 (0.008)	92.8401	866.5 (851.6)	353.2	0.08522 (0.08485)	1.2651	5425.8
0.006 (0.006)	116.9519	818.9 (805.1)	357.2	0.08505 (0.08475)	1.2521	5494.8
0.005 (0.005)	135.3462	789.8 (778.2)	359.6	0.08495 (0.08472)	1.2394	5537.2
0.004 (0.004)	161.7858	755.4 (748.0)	362.4	0.08484 (0.08473)	1.2185	5587.7
0.003 (0.003)	203.5157	712.8 (714.0)	365.9	0.08469 (0.08483)	1.1818	5650.4
0.002 (0.002)	280.8833	655.9 (675.8)	370.4	0.08450 (0.08516)	1.1092	5734.5

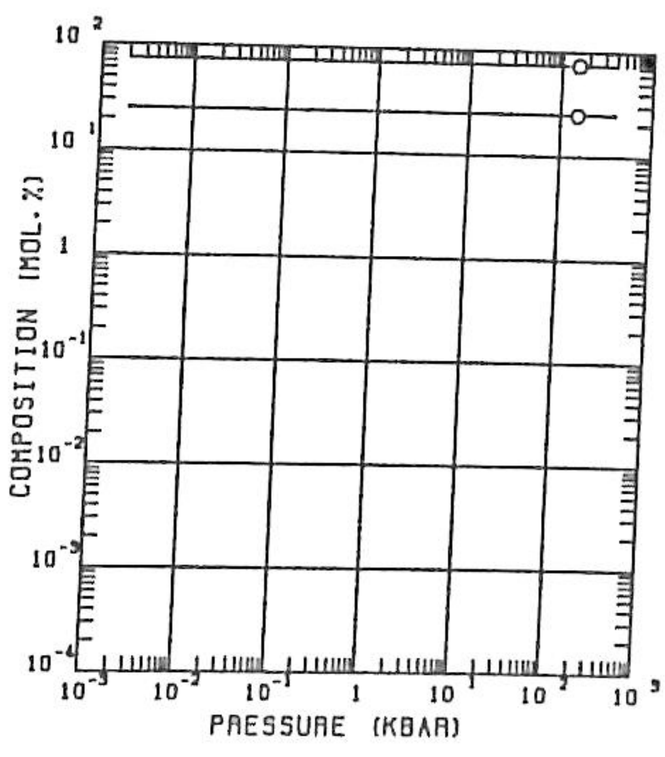
K-H-T ISENTROPE THRU C-J POINT











LEAD AZIDE

RHO (G/CC)	3.500
E_0 (KCAL/MOLE)	113.98
D_{C-J}(M/SEC)	4492.
P_{C-J}(KBAR)	153.1
T_{C-J}(K)	3722.

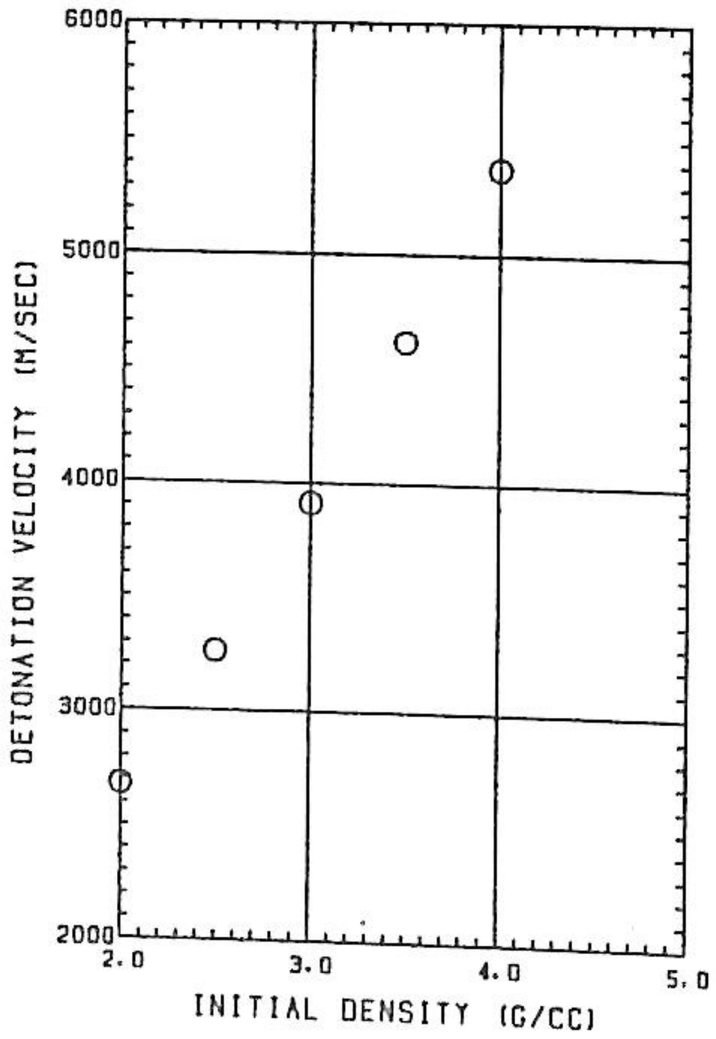
DATE 82-10-26

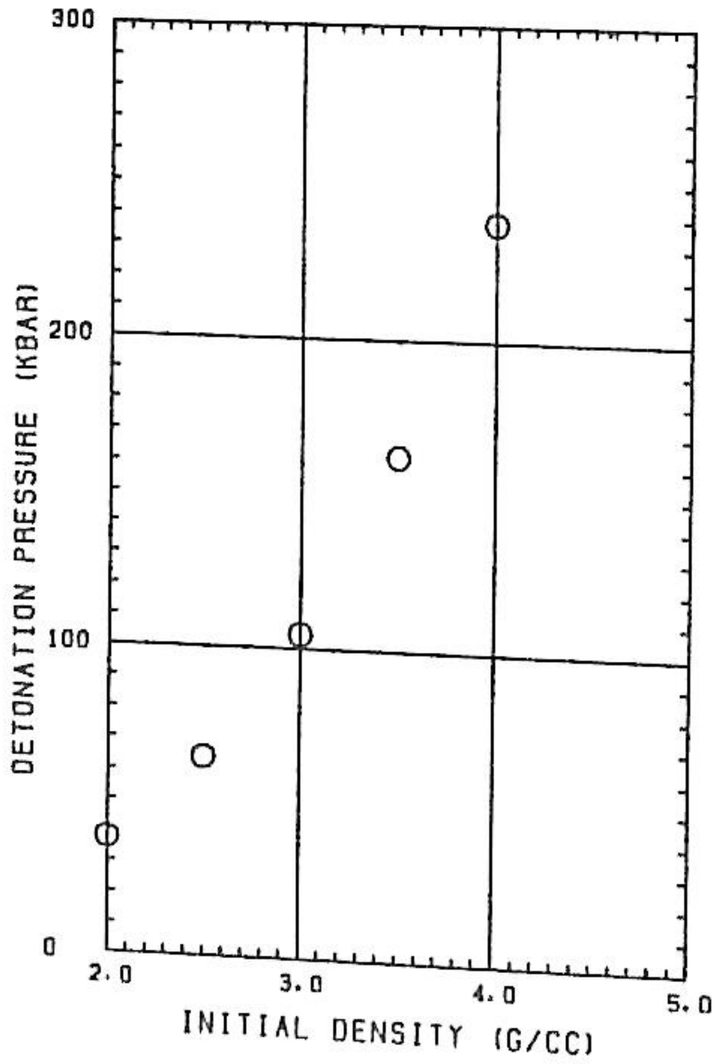
********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-26>> **********

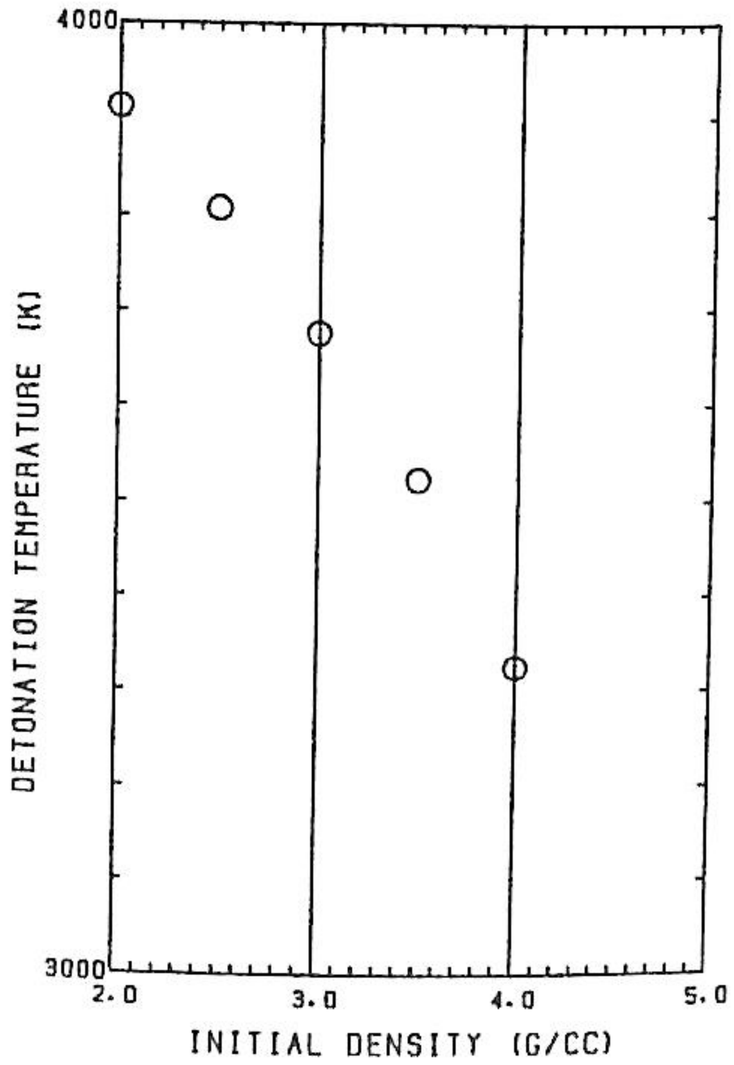
EXPLOSIVES	SILVER AZID# E	SILVER AZID# E	SILVER AZID# E	SILVER AZID# E	SILVER AZID# E
RHO (G/CC)	4.000	3.500	3.000	2.500	2.000
EO (KCAL/MOLE)	68.70	68.70	68.70	68.70	68.70
MOL.WEIGHT (G)	149.890	149.890	149.890	149.890	149.890
AG	1.0000	1.0000	1.0000	1.0000	1.0000
N	3.0000	3.0000	3.0000	3.0000	3.0000
DETN.VEL (M/SEC)	5374.1	4620.6	3911.4	3259.4	2677.0
PARTICL.VEL(")	1105.5	1004.0	890.3	789.1	700.0
C-J PRESS (KBAR)	237.6	162.4	104.5	64.3	37.5
C-J VOLUME (CC/G)	0.19858	0.22364	0.25746	0.30316	0.36925
C-J TEMP (DEG K)	3326.6	3524.7	3677.9	3807.8	3912.1
C-J S(CAL/DEG MOL)	62.63	64.18	65.48	66.67	67.78
C-J ENERGY (CAL/G)	146.04	120.45	94.71	74.41	58.56
GAMMA	3.861	3.602	3.394	3.131	2.824
C-J DETN.HEAT(CAL)	458.3	458.3	458.3	458.3	458.3
LAMDA	9.8000	9.8000	9.8000	9.8000	9.8000
VOLUM(K LITTRE/KG)	0.2448	0.2448	0.2448	0.2448	0.2448
TOTAL PRODCT(MOLE)	2.5000	2.5000	2.5000	2.5000	2.5000
V GAS (MOLES)	1.5000	1.5000	1.5000	1.5000	1.5000
V GAS (CC/MOLE)	13.9016	16.1940	19.3740	23.7744	30.2506
V SOL AG(S (CC/G)	0.08262	0.08556	0.08835	0.09066	0.09244
N2 (MOL %)	60.0000	60.0000	60.0000	60.0000	60.0000
AG(S) (MOL %)	40.0000	40.0000	40.0000	40.0000	40.0000

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

K-H-T C-J DETONATION PROPERTIES







O SILVER AZIDE

DATE 82-10-26

Supplements

C-N-O System

Equation of state constant of CO_2, λ, is changed from 14 to 15.5 which results give good agreements to experimental data.

Aluminum explosives

Aluminum as the component of explosives is treated as inert additive, that gives good agreement to experimental data.

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

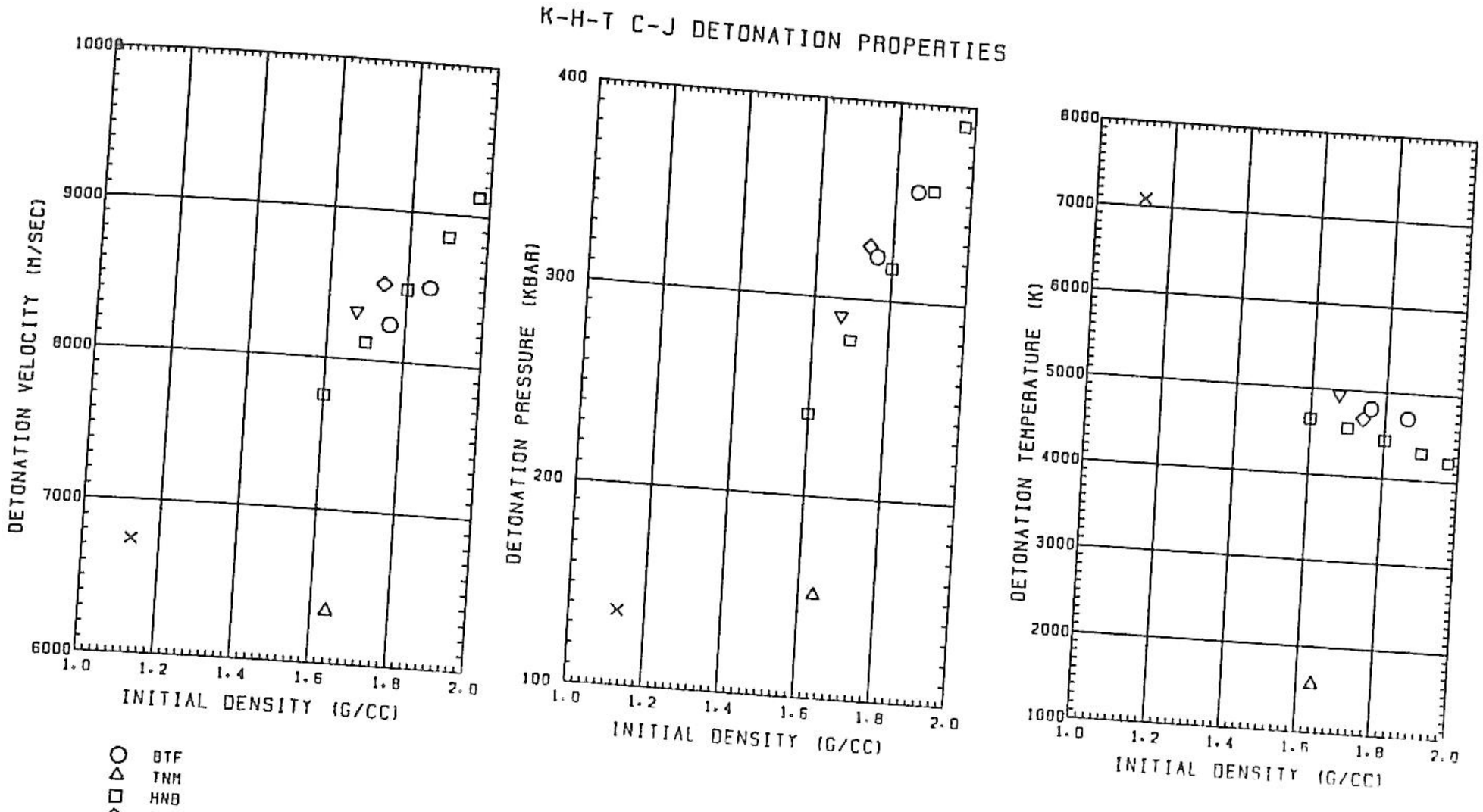
EXPLOSIVES	BTF	# BTF	# TNM	# HNB	# HNB	# HNB	# HNB	#
RHO (G/CC)	1.859	1.760	1.640	1.973	1.900	1.800	1.700	
EO (KCAL/MOLE)	144.00	144.00	8.80	10.00	10.00	10.00	10.00	
MOL.WEIGHT (G)	252.103	252.103	196.033	348.100	348.100	348.100	348.100	
C	6.0000	6.0000	1.0000	6.0000	6.0000	6.0000	6.0000	
N	6.0000	6.0000	4.0000	6.0000	6.0000	6.0000	6.0000	
O	6.0000	6.0000	8.0000	12.0000	12.0000	12.0000	12.0000	
DETN.VEL (M/SEC)	8503.5	8241.0	6342.0	9128.8	8848.8	8480.2	8116.0	
PARTICL.VEL(")	2249.4	2217.6	1453.1	2166.1	2120.1	2071.6	2021.8	
C-J PRESS (KBAR)	355.6	321.6	151.1	390.1	356.4	316.2	278.9	
C-J VOLUME (CC/G)	0.39563	0.41529	0.47005	0.38658	0.40021	0.41984	0.44170	
C-J TEMP (DEG K)	4708.7	4802.5	1564.8	4216.4	4316.3	4445.9	4559.4	
C-J S(CAL/DEG MOL)	62.16	61.73	43.96	57.89	58.27	58.73	59.12	
C-J ENERGY (CAL/G)	604.66	587.66	252.33	560.72	537.15	512.83	488.47	
GAMMA	2.780	2.716	3.364	3.214	3.174	3.094	3.014	
C-J DETN.HEAT(CAL)	1583.4	1565.4	522.6	1571.9	1556.3	1532.9	1508.1	
LAMDA	12.0634	11.9071	10.4489	13.3049	13.2454	13.1560	13.0618	
VOLUM(K LITTRE/KG)	0.6173	0.6303	0.7488	0.6442	0.6467	0.6503	0.6543	
TOTAL PRODCT(MOLE)	9.0943	9.0858	6.0000	9.1665	9.2010	9.2534	9.3094	
V GAS (MOLES)	6.3608	6.4955	6.0000	9.1665	9.2010	9.2535	9.3094	
V GAS (CC/MOLE)	14.4446	14.9023	15.3574	14.6804	15.1412	15.7938	16.5162	
V SOL C(S) (CC/G)	0.23943	0.25389	0.31742	0.22328	0.23747	0.25468	0.27107	
CO2 (MOL %)	27.9843	26.6212	16.6667	61.8233	60.8403	59.3627	57.8027	
CO (MOL %)	7.9337	10.9063	0.0000	3.6325	4.3698	5.4779	6.6479	
N2 (MOL %)	32.1632	32.2517	33.1762	31.5653	31.2594	30.8153	30.3677	
O2 (MOL %)	0.2121	0.1774	49.8428	0.6536	0.8393	1.1340	1.4663	
NO (MOL %)	1.6491	1.5337	0.3142	2.3253	2.6912	3.2100	3.7154	
C(S) (MOL %)	30.0576	28.5096	0.0	0.0	0.0	0.0	0.0	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-10-28>> **********

EXPLOSIVES	HNB	# TNTAB	#BTF/TNM 1/1 MOLE	#CYANOGEN/TNM# 3/1 MOLE
RHO (G/CC)	1.600	1.740	1.673	1.128
EO (KCAL/MOLE)	10.00	270.00	152.80	230.50
MOL.WEIGHT (G)	348.100	336.144	448.136	274.087
C	6.0000	6.0000	7.0000	4.0000
N	6.0000	12.0000	10.0000	7.0000
O	12.0000	6.0000	14.0000	8.0000
DETN.VEL (M/SEC)	7751.4	8506.4	8313.8	6745.8
PARTICL.VEL(")	1942.3	2206.9	2091.2	1798.5
C-J PRESS (KBAR)	240.9	326.6	290.9	136.9
C-J VOLUME (CC/G)	0.46840	0.42561	0.44738	0.65017
C-J TEMP (DEG K)	4646.6	4679.8	4945.3	7093.9
C-J S(CAL/DEG MOL)	59.44	56.74	58.29	61.90
C-J ENERGY (CAL/G)	450.81	582.00	522.59	386.56
GAMMA	2.991	2.855	2.976	2.751
C-J DETN.HEAT(CAL)	1483.3	1534.9	1605.6	1944.1
LAMDA	12.9676	11.1987	12.4128	11.9332
VOLUM(K LITTRE/KG)	0.6583	0.6935	0.6862	0.7113
TOTAL PRODCT(MOLE)	9.3663	12.1101	12.5686	7.9693
V GAS (MOLES)	9.3663	9.5286	12.5686	7.9693
V GAS (CC/MOLE)	17.4081	14.1969	15.9515	22.3611
V SOL C(S) (CC/G)	0.28847	0.25129	0.26758	0.35777
CO2 (MOL %)	56.2385	19.4992	46.6470	38.4154
CO (MOL %)	7.8211	8.7293	9.0475	11.7773
N2 (MOL %)	29.9479	48.7673	37.0735	40.9020
O2 (MOL %)	1.8287	0.1307	1.8154	2.8721
NO (MOL %)	4.1638	1.5564	5.4165	6.0332
C(S) (MOL %)	0.0	21.3171	0.0	0.0

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

HNB RHO = 1.9730 G/CC EO = 1.000000E+04 CAL/MOLE

LN P = -3.54759884 E+00 -2.37154198 E+00LN V 3.59832466 E-01LN V*2 -4.74482775 E-02LN V*3 2.25627027 E-03LN V*4

LN T = 8.06947327 E+00 -2.47129858 E-01LN V 4.49017696 E-02LN V*2 -1.04182810 E-02LN V*3 7.25329621 E-04LN V*4

LN E = -1.72559834 E+00 4.39106882 E-01LNP 6.60971403 E-02LN P*2 5.23422658 E-03LN P*3 1.54725145 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
600.000 (611.885)	0.3383	4635.8 (4466.3)	-1131.8	0.14735 (0.14466)	3.3302	1159.8
500.000 (506.273)	0.3583	4452.2 (4369.9)	-861.4	0.13604 (0.13535)	3.2699	1608.9
400.000 (405.985)	0.3836	4239.9 (4260.9)	-588.7	0.12463 (0.12538)	3.1997	2112.1
* 390.146 (395.906)	0.3866	4216.4 (4248.8)	-559.3	0.12340 (0.12436)	3.1917	2166.1
300.000 (301.603)	0.4215	4074.1 (4119.9)	-327.3	0.11369 (0.11449)	3.1052	2738.9
200.000 (197.552)	0.4845	3871.2 (3929.5)	-33.0	0.10138 (0.10209)	2.9711	3545.5
100.000 (97.034)	0.6214	3581.1 (3635.0)	330.2	0.08619 (0.08666)	2.7471	4705.4
80.000 (77.568)	0.6749	3500.6 (3548.3)	419.1	0.08246 (0.08282)	2.6771	5027.7
60.000 (58.293)	0.7523	3403.6 (3441.6)	519.2	0.07828 (0.07850)	2.5881	5413.1
50.000 (48.724)	0.8069	3345.4 (3376.8)	575.1	0.07594 (0.07607)	2.5326	5641.5
40.000 (39.180)	0.8804	3277.1 (3300.1)	636.8	0.07335 (0.07338)	2.4655	5906.1
30.000 (29.636)	0.9879	3192.8 (3205.0)	707.2	0.07041 (0.07030)	2.3803	6225.9
20.000 (20.030)	1.1696	3078.8 (3077.3)	792.1	0.06686 (0.06660)	2.2622	6642.0
10.000 (10.212)	1.5974	2889.4 (2871.4)	909.6	0.06194 (0.06157)	2.0648	7282.3
8.000 (8.195)	1.7800	2828.7 (2807.3)	942.0	0.06059 (0.06021)	2.0022	7474.0
6.000 (6.153)	2.0600	2749.6 (2726.0)	981.0	0.05895 (0.05860)	1.9224	7712.5
5.000 (5.122)	2.2689	2699.2 (2675.1)	1004.3	0.05798 (0.05766)	1.8725	7859.1
4.000 (4.087)	2.5647	2637.3 (2613.4)	1031.5	0.05684 (0.05657)	1.8125	8033.9
3.000 (3.050)	3.0245	2557.6 (2534.9)	1064.5	0.05546 (0.05525)	1.7372	8251.6
2.000 (2.018)	3.8643	2445.7 (2426.4)	1107.9	0.05365 (0.05355)	1.6365	8544.5
1.000 (0.999)	6.0709	2255.5 (2244.8)	1174.9	0.05084 (0.05090)	1.4837	9011.0
0.800 (0.797)	7.0847	2194.7 (2186.8)	1194.9	0.05000 (0.05010)	1.4404	9153.8
0.600 (0.596)	8.7003	2115.8 (2112.0)	1220.0	0.04895 (0.04910)	1.3895	9333.5
0.500 (0.496)	9.9452	2065.4 (2064.5)	1235.6	0.04830 (0.04848)	1.3601	9445.0
0.400 (0.396)	11.7586	2003.9 (2006.1)	1254.1	0.04753 (0.04773)	1.3274	9579.4
0.300 (0.296)	14.6723	1924.6 (1930.4)	1277.3	0.04656 (0.04679)	1.2906	9749.2
0.200 (0.197)	20.2143	1813.6 (1823.5)	1308.9	0.04524 (0.04548)	1.2493	9982.1
0.100 (0.099)	35.4726	1627.6 (1641.8)	1359.8	0.04311 (0.04332)	1.2059	10362.8
0.080 (0.079)	42.6315	1570.9 (1584.0)	1374.9	0.04247 (0.04265)	1.1985	10481.2
0.060 (0.060)	54.0734	1499.6 (1510.6)	1393.7	0.04169 (0.04181)	1.1929	10630.8
0.050 (0.050)	62.9371	1456.9 (1464.6)	1404.9	0.04122 (0.04128)	1.1915	10724.3
0.040 (0.040)	75.6673	1403.1 (1409.8)	1418.9	0.04063 (0.04066)	1.1915	10836.0
0.030 (0.030)	96.0623	1337.6 (1340.7)	1435.7	0.03993 (0.03988)	1.1941	10977.9
0.020 (0.020)	134.4529	1249.4 (1247.4)	1458.0	0.03900 (0.03884)	1.2011	11172.7
0.010 (0.010)	238.4565	1108.8 (1101.6)	1493.0	0.03753 (0.03729)	1.2171	11491.3
0.008 (0.008)	286.9146	1067.4 (1058.6)	1503.1	0.03711 (0.03686)	1.2219	11590.4
0.006 (0.006)	363.7144	1015.0 (1006.7)	1515.8	0.03658 (0.03636)	1.2269	11714.9
0.005 (0.005)	422.9526	983.7 (975.6)	1523.3	0.03627 (0.03608)	1.2292	11792.5
0.004 (0.004)	507.6821	944.6 (940.2)	1532.6	0.03588 (0.03579)	1.2305	11884.7
0.003 (0.003)	642.7681	897.0 (898.1)	1543.7	0.03541 (0.03549)	1.2297	12000.9
0.002 (0.002)	896.1619	833.7 (846.1)	1558.3	0.03480 (0.03524)	1.2221	12159.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

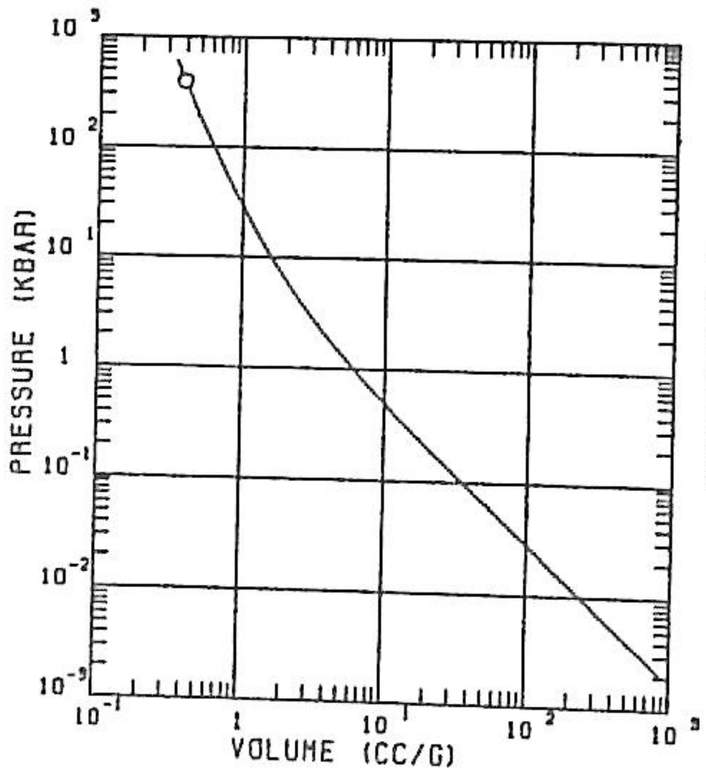
HNB RHO = 1.9730 G/CC EO = 1.000000E+04 CAL/MOLE

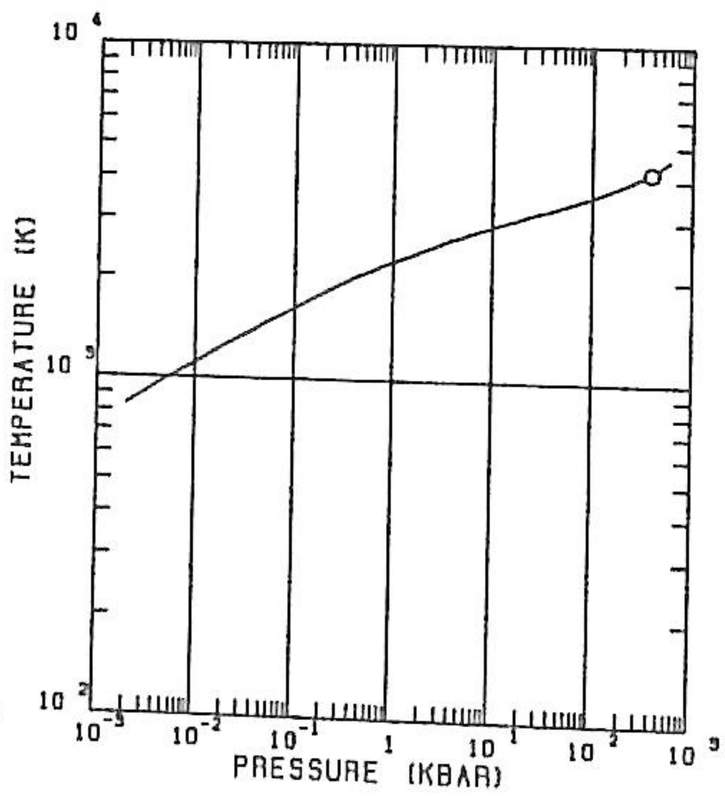
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

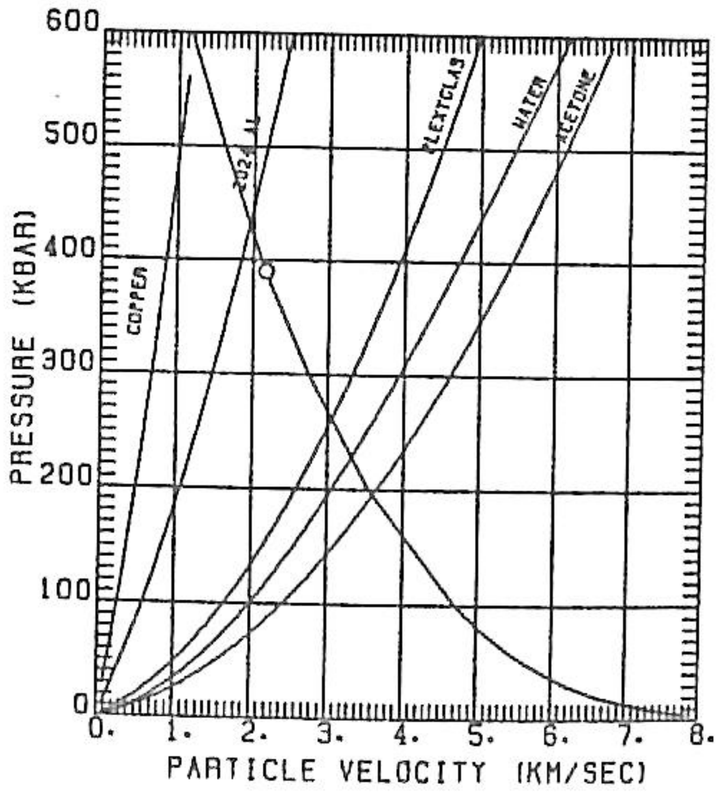
PRESS	CO2	CO	N2	O2	NO	C(S)
390.146	5.66658	0.33342	2.89335	0.06006	0.21330	0.0
300.000	5.67318	0.32682	2.90284	0.06625	0.19431	0.0
200.000	5.68960	0.31040	2.91733	0.07253	0.16534	0.0
100.000	5.72564	0.27436	2.93830	0.07548	0.12340	0.0
80.000	5.73827	0.26173	2.94393	0.07480	0.11214	0.0
60.000	5.75494	0.24506	2.95049	0.07302	0.09903	0.0
50.000	5.76570	0.23430	2.95428	0.07143	0.09144	0.0
40.000	5.77903	0.22097	2.95858	0.06907	0.08283	0.0
30.000	5.79638	0.20362	2.96365	0.06545	0.07271	0.0
20.000	5.82105	0.17895	2.97000	0.05948	0.06000	0.0
10.000	5.86308	0.13693	2.97916	0.04763	0.04167	0.0
8.000	5.87619	0.12381	2.98170	0.04361	0.03659	0.0
6.000	5.89277	0.10723	2.98472	0.03834	0.03055	0.0
5.000	5.90287	0.09713	2.98647	0.03504	0.02705	0.0
4.000	5.91469	0.08532	2.98844	0.03110	0.02311	0.0
3.000	5.92883	0.07117	2.99069	0.02627	0.01862	0.0
2.000	5.94640	0.05360	2.99332	0.02012	0.01336	0.0
1.000	5.96974	0.03026	2.99652	0.01165	0.00695	0.0
0.800	5.97547	0.02453	2.99725	0.00952	0.00549	0.0
0.600	5.98174	0.01826	2.99802	0.00715	0.00395	0.0
0.500	5.98512	0.01489	2.99842	0.00586	0.00316	0.0
0.400	5.98858	0.01142	2.99882	0.00453	0.00236	0.0
0.300	5.99213	0.00787	2.99921	0.00315	0.00157	0.0
0.200	5.99562	0.00438	2.99958	0.00177	0.00083	0.0
0.100	5.99867	0.00133	2.99988	0.00055	0.00023	0.0
0.080	5.99913	0.00087	2.99993	0.00036	0.00015	0.0
0.060	5.99952	0.00048	2.99996	0.00020	0.00008	0.0
0.050	5.99967	0.00033	2.99997	0.00014	0.00005	0.0
0.040	5.99980	0.00020	2.99998	0.00008	0.00003	0.0
0.030	5.99991	0.00009	2.99999	0.00004	0.00001	0.0
0.020	5.99997	0.00004	3.00000	0.00001	0.00000	0.0
0.010	6.00000	0.00001	3.00000	0.00000	0.00000	0.0
0.008	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.006	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.005	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.004	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.003	6.00000	0.00000	3.00000	0.00000	0.00000	0.0
0.002	6.00001	0.00000	3.00000	0.00000	0.00000	0.0
400.000	5.66236	0.33764	2.89127	0.06009	0.21746	0.0
500.000	5.62253	0.36534	2.86851	0.06331	0.26299	0.01214
600.000	5.55783	0.30804	2.81190	0.10004	0.37621	0.13413

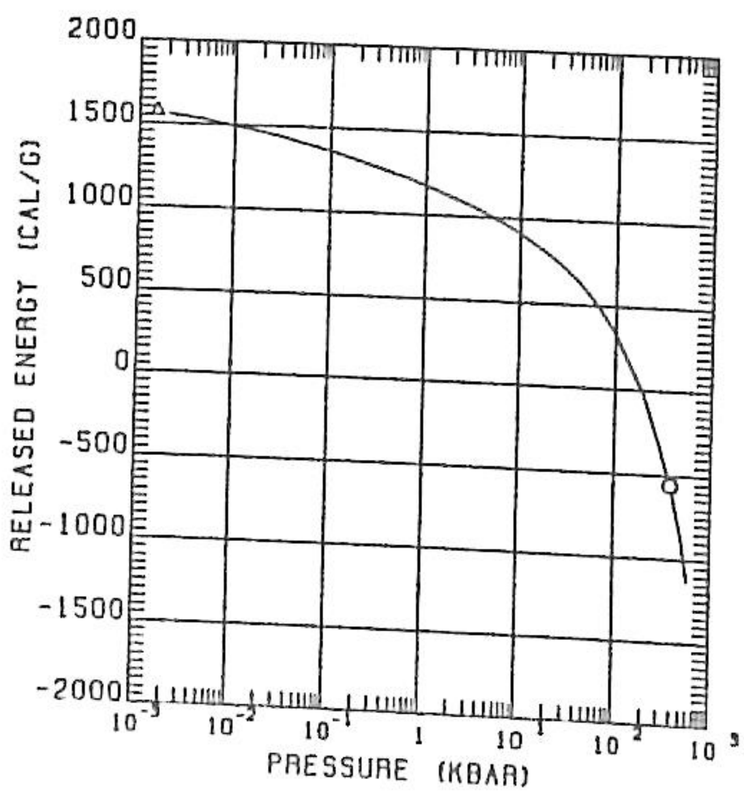
PRESS ;KBAR, PRODUCTS ;MOLES

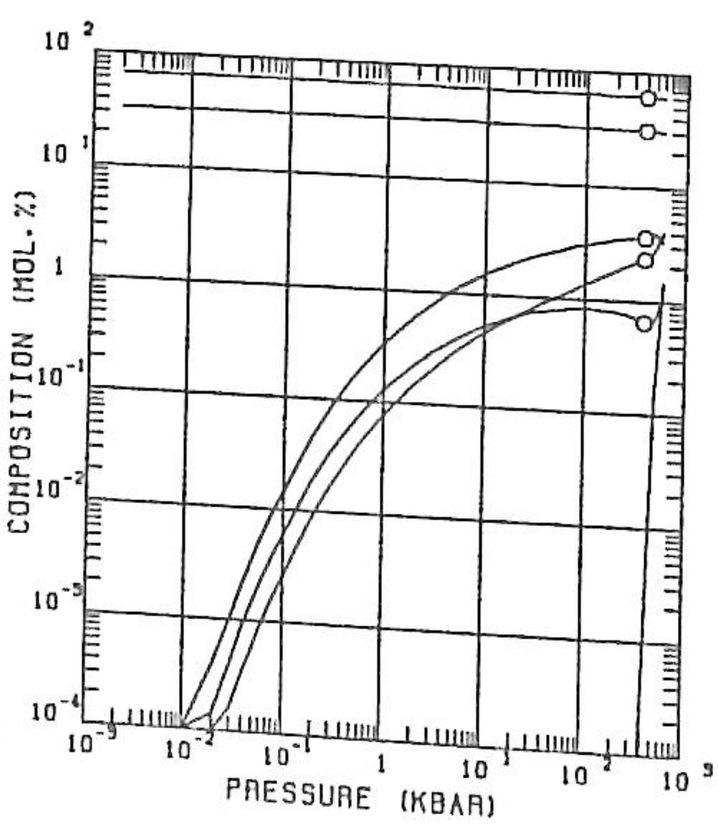
K-H-T ISENTROPE THRU C-J POINT











HNB

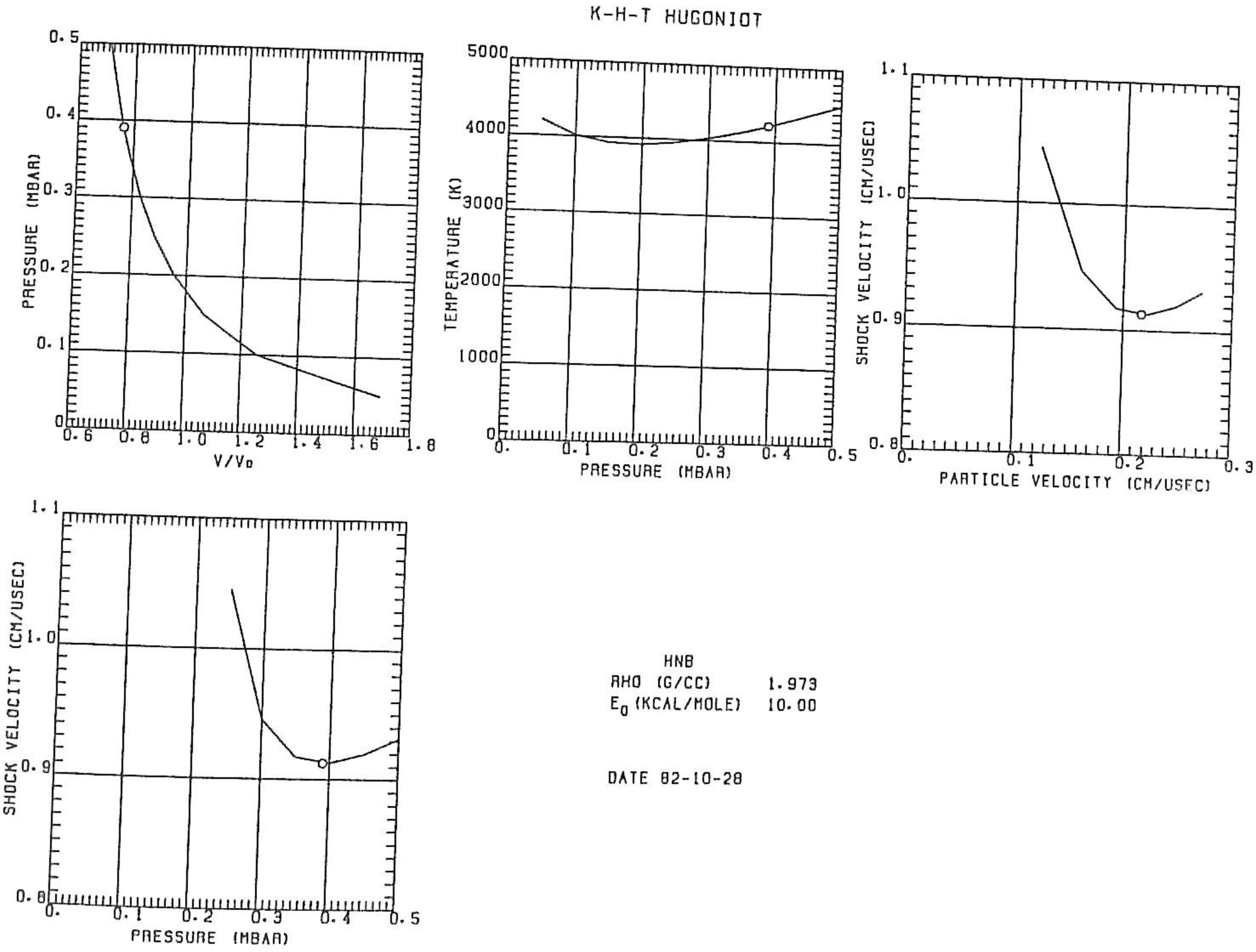
RHO (G/CC)	1.973
E_0 (KCAL/MOLE)	10.00
D_{C-J}(M/SEC)	9129.
P_{C-J}(KBAR)	390.1
T_{C-J}(K)	4216.

DATE 82-10-28

********** A K-H-T H U G O-N I O T <<DATE 82-10-28>>**********

HNB RHO = 1.9730 G/CC, EO = 1.000000E+04 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3588	0.3702	0.3835	0.4000	0.4207	0.4480	0.4856	0.5416	0.6370	0.8573
TEMP (DEG K)	4508.2	4369.4	4238.3	4123.4	4026.6	3955.0	3916.2	3926.2	4009.4	4209.6
US (M/SEC)	9315.1	9197.4	9128.6	9172.0	9459.8	10449.2	0.0	0.0	0.0	0.0
UP (M/SEC)	2720.5	2479.8	2220.9	1934.1	1607.4	1212.6	0.0	0.0	0.0	0.0
CO2 (MOLE)	5.5972	5.6336	5.6635	5.6840	5.6945	5.6910	5.6680	5.6094	5.4776	5.1589
CO (MOLE)	0.3918	0.3664	0.3365	0.3160	0.3055	0.3090	0.3320	0.3906	0.5224	0.8410
N2 (MOLE)	2.8608	2.8787	2.8915	2.9016	2.9088	2.9125	2.9119	2.9045	2.8850	2.8391
O2 (MOLE)	0.0677	0.0619	0.0598	0.0596	0.0615	0.0670	0.0779	0.0998	0.1462	0.2596
NO (MOLE)	0.2784	0.2427	0.2169	0.1969	0.1825	0.1750	0.1762	0.1910	0.2300	0.3218
C(S) (MOLE)	0.0110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



HNB
RHO (G/CC) 1.973
E_0 (KCAL/MOLE) 10.00

DATE 82-10-28

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

TNM RHO = 1.6400 G/CC EO = 8.800398E+03 CAL/MOLE

LN P = -4.10810566 E+00 -2.70477390 E+00LN V 3.43881607 E-01LN V*2 -2.79740468 E-02LN V*3 -7.06935301 E-04LN V*4

LN T = 6.95724487 E+00 -4.56284404 E-01LN V 1.25676632 E-01LN V*2 -5.56859039 E-02LN V*3 7.80037045 E-03LN V*4

LN E = -1.65403748 E+00 4.09180701 E-01LNP 7.76149631 E-02LN P*2 6.83145970 E-03LN P*3 2.25707117 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
400.000 (386.739)	0.3593	2179.7 (2047.2)	-981.7	0.14108 (0.13961)	3.4937	0.0
300.000 (297.554)	0.3876	1927.4 (1912.9)	-697.0	0.12916 (0.12930)	3.4297	345.1
200.000 (204.014)	0.4333	1695.6 (1742.6)	-406.5	0.11701 (0.11783)	3.3370	1029.4
* 151.137 (155.927)	0.4700	1564.8 (1635.7)	-252.4	0.11056 (0.11155)	3.2706	1453.1
100.000 (102.160)	0.5360	1451.7 (1488.2)	-89.0	0.10372 (0.10417)	3.1656	2046.7
80.000 (81.050)	0.5771	1393.2 (1416.6)	-17.5	0.10073 (0.10094)	3.1078	2340.8
60.000 (60.146)	0.6360	1321.3 (1332.7)	61.3	0.09744 (0.09741)	3.0330	2691.0
50.000 (49.830)	0.6770	1278.6 (1284.1)	104.4	0.09563 (0.09549)	2.9856	2896.6
40.000 (39.617)	0.7316	1229.6 (1228.9)	150.9	0.09368 (0.09343)	2.9278	3132.5
30.000 (29.542)	0.8098	1170.8 (1164.0)	202.4	0.09153 (0.09118)	2.8536	3412.6
20.000 (19.625)	0.9371	1095.2 (1082.9)	261.7	0.08905 (0.08865)	2.7498	3766.6
10.000 (9.866)	1.2134	980.1 (966.1)	336.8	0.08591 (0.08560)	2.5749	4280.4
8.000 (7.919)	1.3228	947.7 (932.9)	355.3	0.08513 (0.08488)	2.5190	4426.2
6.000 (5.972)	1.4820	906.2 (892.5)	376.6	0.08424 (0.08407)	2.4474	4601.9
5.000 (4.996)	1.5952	880.4 (868.1)	388.8	0.08373 (0.08363)	2.4022	4707.0
4.000 (4.014)	1.7492	849.7 (839.2)	402.3	0.08317 (0.08314)	2.3469	4829.8
3.000 (3.025)	1.9770	811.1 (803.3)	417.9	0.08252 (0.08258)	2.2759	4979.6
2.000 (2.025)	2.3677	757.7 (754.4)	437.0	0.08171 (0.08189)	2.1761	5176.5
1.000 (1.012)	3.2998	668.1 (673.7)	464.2	0.08058 (0.08087)	2.0081	5479.9
0.800 (0.806)	3.7017	642.0 (647.7)	471.4	0.08028 (0.08057)	1.9547	5570.8
0.600 (0.602)	4.3093	607.4 (614.5)	480.2	0.07991 (0.08017)	1.8880	5681.8
0.500 (0.500)	4.7577	586.0 (593.6)	485.5	0.07969 (0.07993)	1.8469	5749.2
0.400 (0.399)	5.3861	560.5 (568.0)	491.5	0.07944 (0.07963)	1.7981	5828.9
0.300 (0.298)	6.3476	528.6 (535.3)	498.7	0.07914 (0.07925)	1.7382	5926.9
0.200 (0.199)	8.0641	485.4 (489.8)	507.9	0.07875 (0.07872)	1.6605	6057.1
0.100 (0.100)	12.4021	416.4 (415.6)	521.6	0.07818 (0.07793)	1.5503	6261.3
0.080 (0.080)	14.3375	396.0 (393.1)	525.4	0.07802 (0.07773)	1.5218	6323.3
0.060 (0.060)	17.3288	369.8 (365.9)	530.2	0,07782 (0.07752)	1.4914	6400.1
0.050 (0.050)	19.5804	353.9 (349.7)	533.0	0.07770 (0.07743)	1.4760	6447.4
0.040 (0.040)	22.7784	334.9 (331.3)	536.3	0.07756 (0.07738)	1.4613	6503.7
0.030 (0.030)	27.7512	311.3 (310.0)	540.4	0.07739 (0.07741)	1.4498	6574.1
0.020 (0.020)	36.8081	280.2 (285.4)	545.6	0.07717 (0.07770)	1.4485	6669.2

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-10-28>> **********

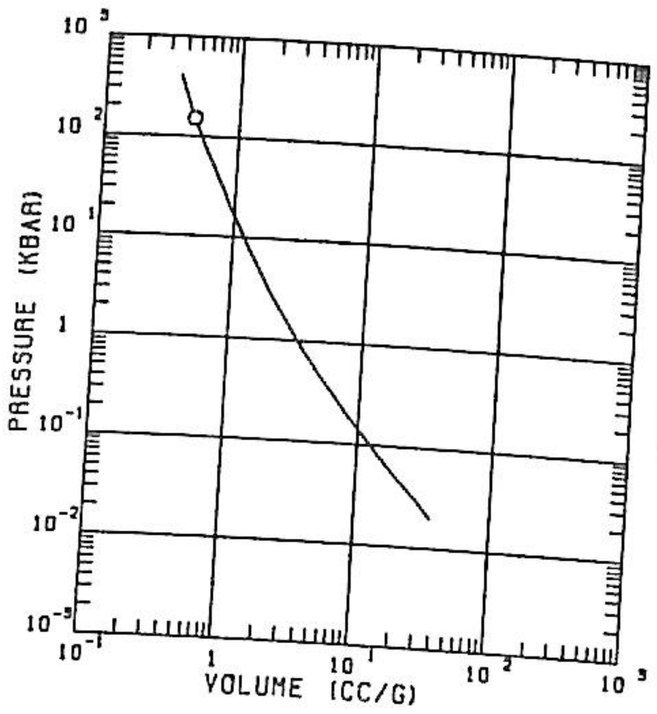
TNM RHO = 1.6400 G/CC EO = 8.800398E+03 CAL/MOLE

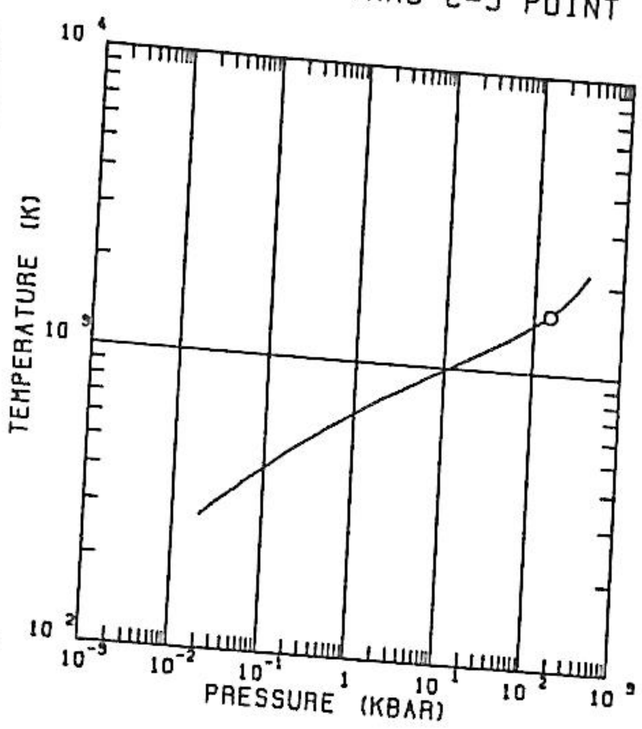
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

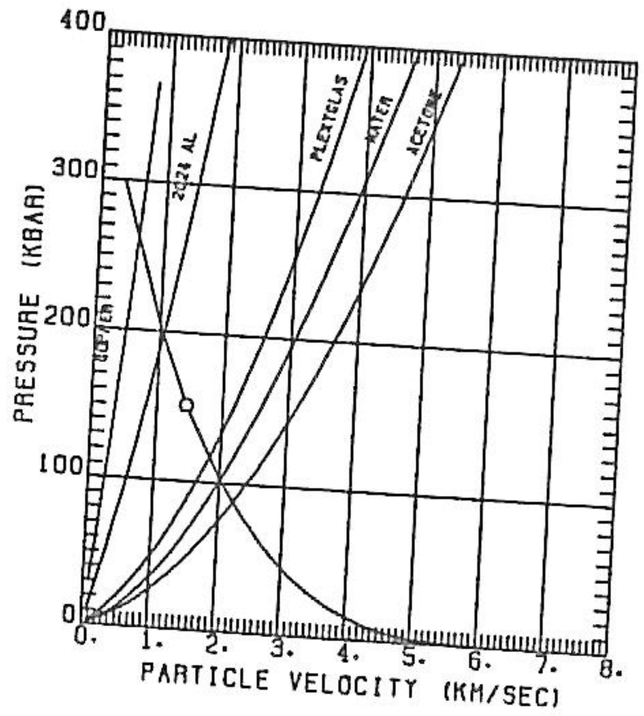
PRESS	CO2	CO	N2	O2	NO	C(S)
151.137	1.00000	0.00000	1.99057	2.99057	0.01885	0.0
100.000	1.00001	0.00000	1.99509	2.99508	0.00983	0.0
80.000	1.00001	0.00000	1.99658	2.99658	0.00683	0.0
60.000	1.00001	0.00000	1.99789	2.99788	0.00422	0.0
50.000	1.00001	0.00000	1.99845	2.99844	0.00311	0.0
40.000	1.00001	0.00000	1.99893	2.99893	0.00214	0.0
30.000	1.00001	0.00000	1.99934	2.99934	0.00132	0.0
20.000	1.00001	0.00000	1.99967	2.99966	0.00066	0.0
10.000	1.00002	0.00000	1.99990	2.99990	0.00019	0.0
8.000	1.00002	0.00000	1.99997	2.99997	0.00005	0.0
6.000	1.00002	0.00000	1.99998	2.99997	0.00004	0.0
5.000	1.00002	0.00000	1.99999	2.99998	0.00003	0.0
4.000	1.00002	0.00000	1.99999	2.99998	0.00001	0.0
3.000	1.00002	0.00000	2.00000	2.99999	0.00000	0.0
2.000	1.00003	0.00000	2.00000	2.99999	0.00000	0.0
1.000	1.00003	0.00000	2.00000	2.99998	0.00000	0.0
0.800	1.00003	0.00000	2.00000	2.99998	0.00000	0.0
0.600	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.500	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.400	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.300	1.00004	0.00000	2.00000	2.99998	0.00000	0.0
0.200	1.00005	0.00000	2.00000	2.99998	0.00000	0.0
0.100	1.00006	0.00000	2.00000	2.99998	0.00000	0.0
0.080	1.00006	0.00000	2.00000	2.99997	0.00000	0.0
0.060	1.00007	0.00000	2.00000	2.99997	0.00000	0.0
0.050	1.00008	0.00000	2.00001	2.99997	0.00000	0.0
0.040	1.00008	0.00000	2.00001	2.99997	0.00000	0.0
0.030	1.00009	0.00000	2.00001	2.99997	0.00000	0.0
0.020	1.00010	0.00000	2.00001	2.99996	0.00000	0.0
200.000	1.00000	0.00000	1.98267	2.98267	0.03465	0.0
300.000	1.00000	0.00000	1.95811	2.95811	0.08377	0.0
400.000	1.00000	0.00000	1.91480	2.91481	0.17039	0.0

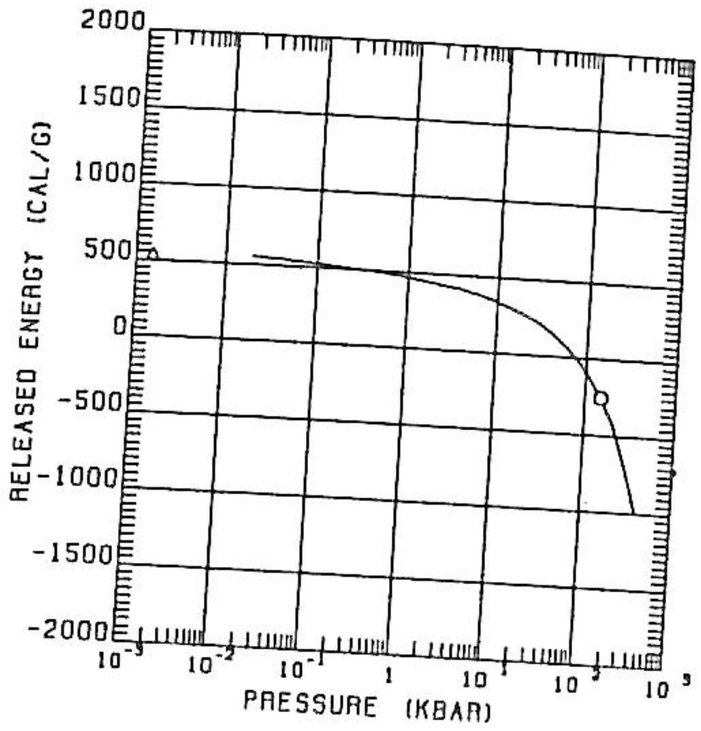
PRESS ;KBAR, PRODUCTS ;MOLES

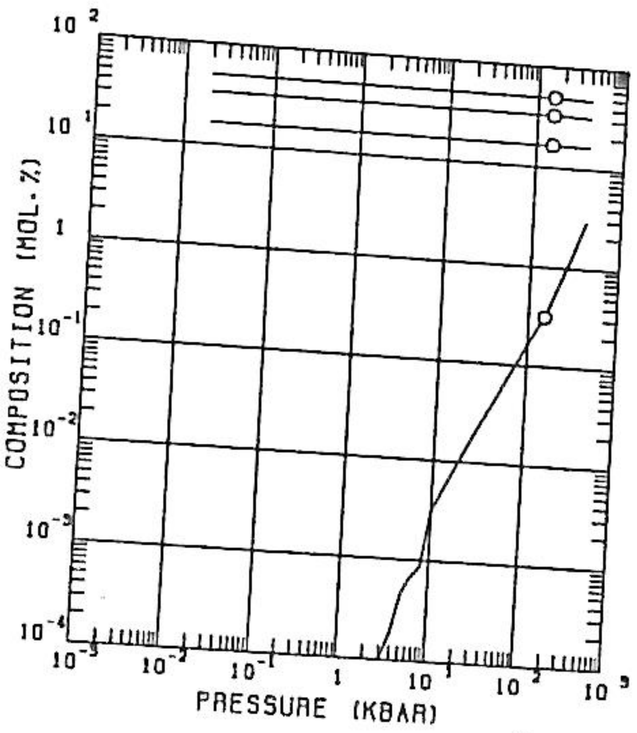
K-H-T ISENTROPE THRU C-J POINT











TNM

RHO (G/CC)	1.640
E_0 (KCAL/MOLE)	8.80
D_{C-J}(M/SEC)	6342.
P_{C-J}(KBAR)	151.1
T_{C-J}(K)	1565.

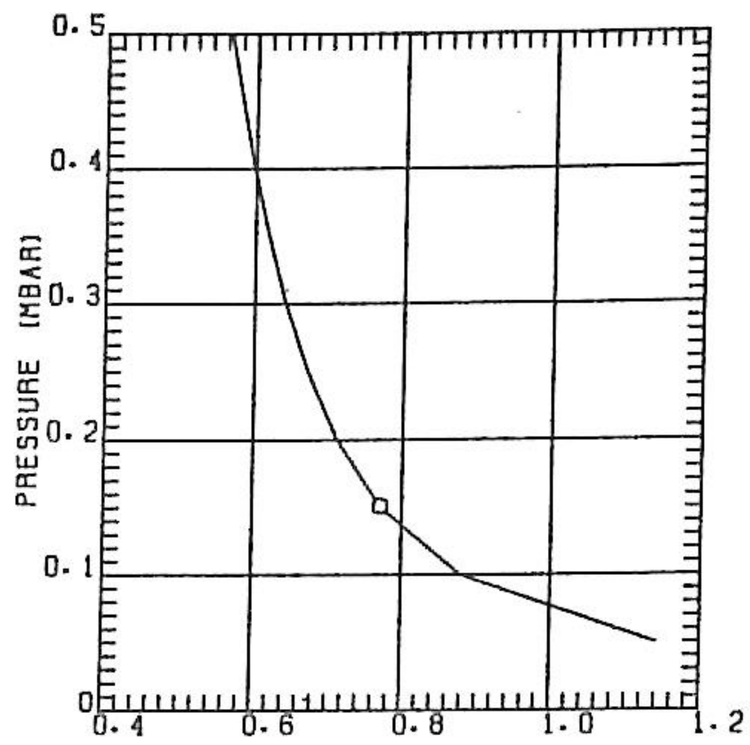
DATE 82-10-28

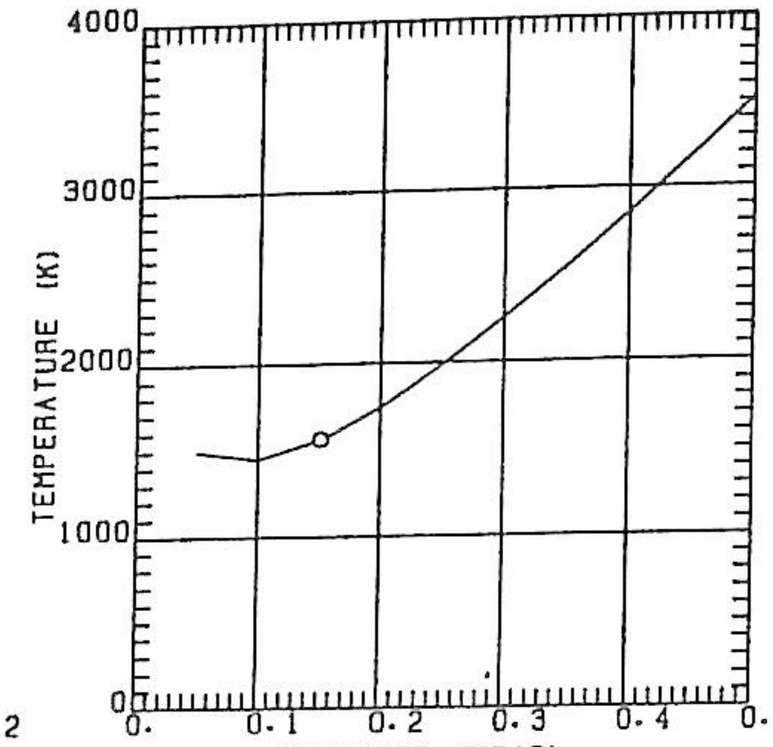
********** A K-H-T H U G O N I O T <<DATE 82-10-28>>**********

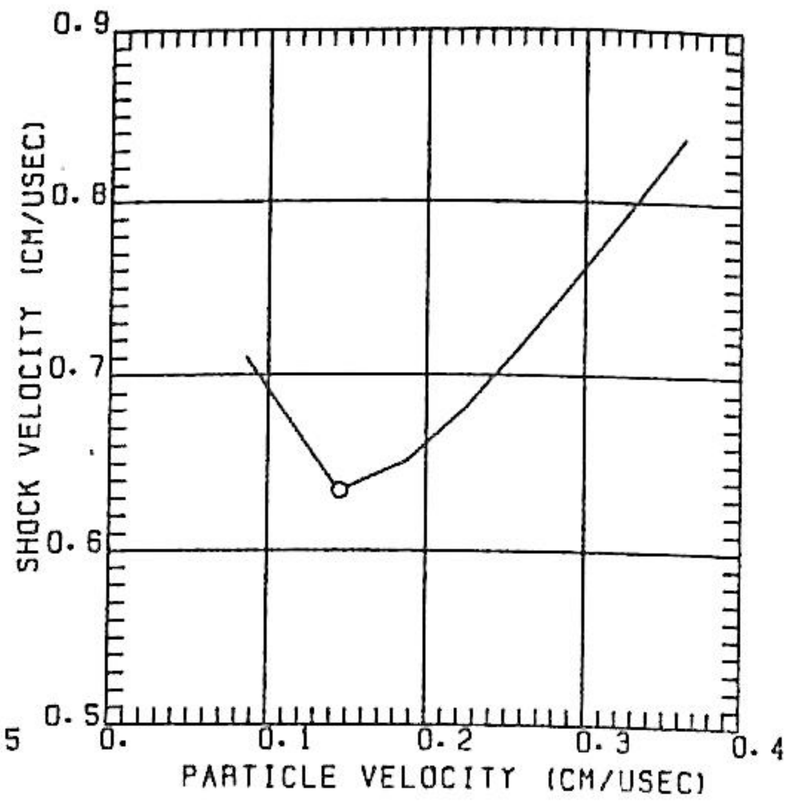
TNM

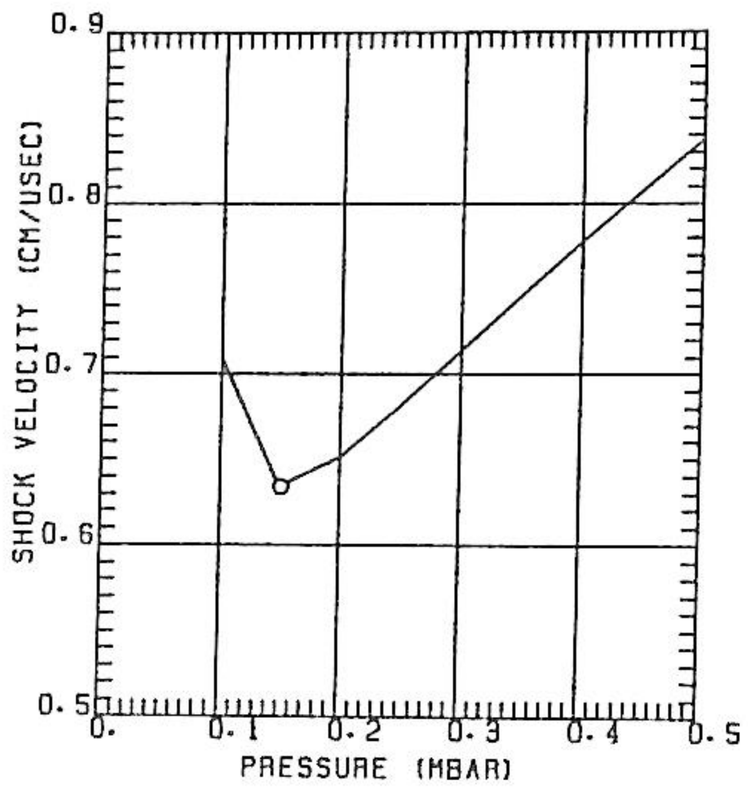
RHO = 1.6400 G/CC, EO = 8.800398E+03 CAL/MOLE

PRESSURE	(KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME	(CC/G)	0.3447	0.3536	0.3638	0.3760	0.3908	0.4095	0.4343	0.4710	0.5359	0.6957
TEMP	(DEG K)	3513.9	3179.4	2851.3	2544.0	2253.1	1984.6	1746.3	1560.2	1448.9	1498.1
US	(M/SEC)	8374.7	8081.8	7776.3	7461.7	7137.9	6812.5	6509.8	6340.4	7096.5	0.0
UP	(M/SEC)	3640.5	3395.1	3136.5	2860.1	2562.8	2237.6	1873.3	1442.5	859.2	0.0
CO2	(MOLE)	0.9983	0.9994	0.9998	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
CO	(MOLE)	0.0017	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	(MOLE)	1.6090	1.7004	1.7862	1.8593	1.9166	1.9561	1.9795	1.9908	1.9952	1.9948
O2	(MOLE)	2.6098	2.7007	2.7863	2.8593	2.9166	2.9561	2.9795	2.9908	2.9951	2.9948
NO	(MOLE)	0.7820	0.5993	0.4275	0.2814	0.1668	0.0877	0.0410	0.0185	0.0097	0.0103
C(S)	(MOLE)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0









TNM

RHO (G/CC) 1.640

E_0 (KCAL/MOLE) 8.80

DATE 82-10-28

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

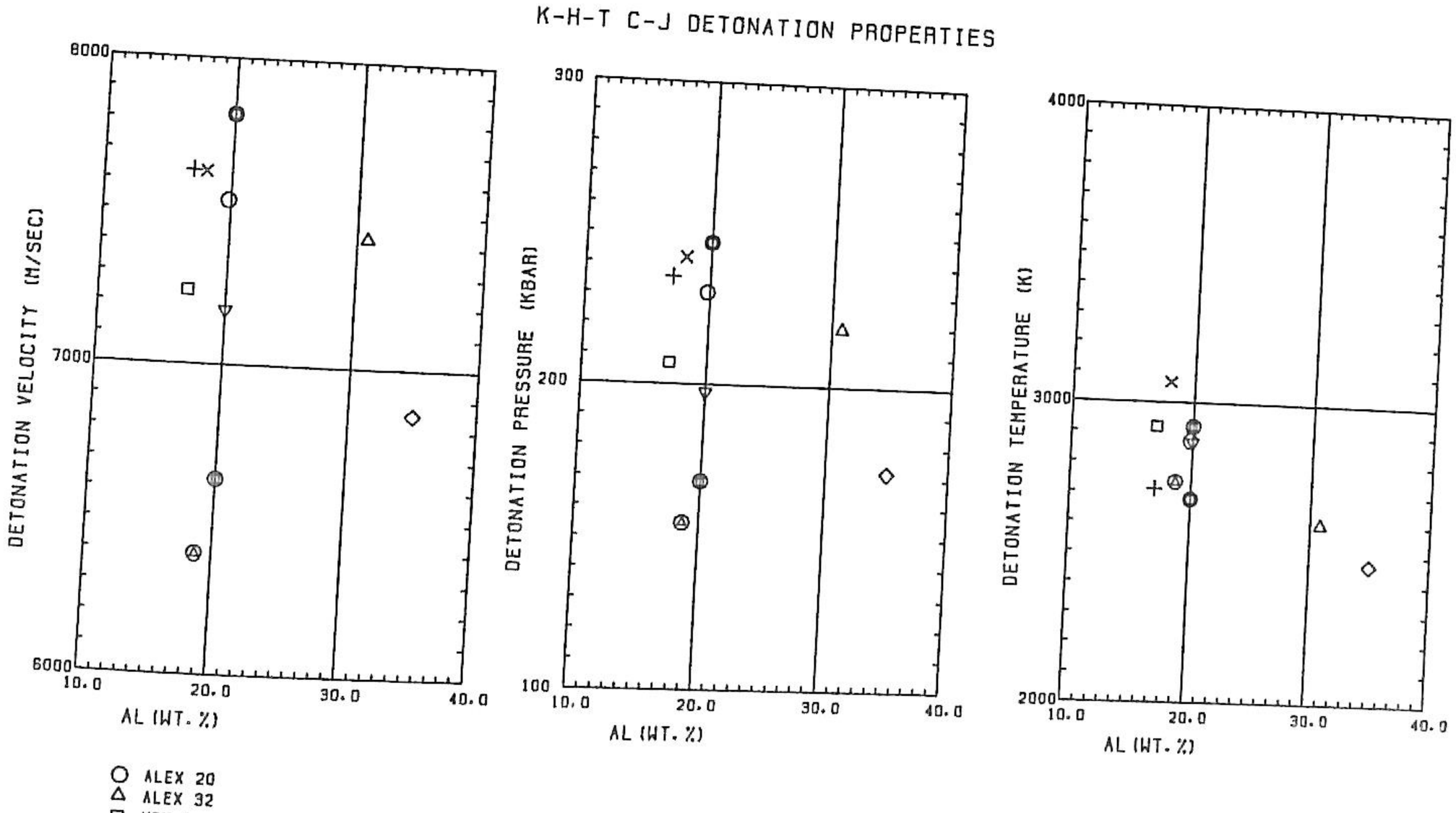
EXPLOSIVES	ALEX 20 RDX/#ALEX 32 RDX/#HBX-1 RDX/#HBX-3 RDX/#H-6 RDX 45 #TORPEX RDX42#PBXC-117 #						
	TNT/AL/WAX	TNT/AL/WAX	TNT/AL/WAX	TNT/AL	TNT/30/AL20	/TNT40/AL18	RDX/AL/BINDE
RHO (G/CC)	1.801	1.880	1.720	1.810	1.710	1.810	1.750
EO (KCAL/MOLE)	-0.66	-0.89	-1.83	-1.95	-0.95	0.70	-7.26
MOL.WEIGHT (G)	100.000	100.000	100.000	100.000	100.000	100.000	100.008
C	1.8707	1.6459	2.0664	1.6675	1.8874	1.8000	1.6499
H	2.4812	2.2061	2.6468	2.2056	2.6058	2.0151	3.1378
N	1.6139	1.3775	1.5824	1.2204	1.6118	1.6629	1.9464
O	2.0392	1.7446	2.0843	1.6035	2.0081	2.1912	2.0475
AL	0.7338	1.1415	0.6301	1.2972	0.7412	0.6671	0.6303
DETN.VEL (M/SEC)	7536.1	7423.0	7238.6	6853.9	7176.2	7628.2	7632.0
PARTICL.VEL(")	1697.1	1570.7	1661.5	1385.1	1608.6	1751.6	1762.3
C-J PRESS (KBAR)	230.3	219.2	206.9	171.8	197.4	241.8	235.4
C-J VOLUME (CC/G)	0.43021	0.41936	0.44794	0.44083	0.45371	0.42563	0.43948
C-J TEMP (DEG K)	2870.7	2598.8	2917.1	2466.3	2866.1	3067.1	2710.5
C-J S(CAL/DEG MOL)	63.74	67.97	63.72	70.79	63.92	63.93	58.58
C-J ENERGY (CAL/G)	344.17	294.82	329.92	229.28	309.22	366.63	371.15
GAMMA	3.441	3.726	3.357	3.948	3.461	3.355	3.331
C-J DETN.HEAT(CAL)	1082.2	928.7	1098.5	851.1	1069.3	1139.7	1057.1
LAMDA	8.6032	8.5034	8.4696	8.2555	8.4356	9.2718	8.0749
VOLUM(K LITTRE/KG)	0.6007	0.5178	0.6138	0.4816	0.6055	0.5980	0.6815
TOTAL PRODCT(MOLE)	4.6509	4.5785	4.8091	4.6764	4.7352	4.3054	4.8208
V GAS (MOLES)	2.4552	2.1163	2.5087	1.9687	2.4749	2.4442	2.7857
V GAS (CC/MOLE)	12.6562	12.5976	13.0713	13.4109	13.2295	13.1713	11.9546
V C(S) (CC/G)	0.28526	0.28915	0.29638	0.31128	0.30062	0.28094	0.28228
V AL(S) (CC/G)	0.35047	0.34706	0.35627	0.35452	0.35724	0.35227	0.34618
H2O (MOL %)	26.5877	24.0454	27.3683	23.4980	27.3510	23.3149	32.4561
CO2 (MOL %)	8.4576	6.9520	7.7263	5.2947	7.2684	13.4813	4.9272
CO (MOL %)	0.3309	0.1519	0.5113	0.1994	0.5104	0.5921	0.1555
N2 (MOL %)	17.3317	15.0333	16.4258	13.0349	16.9915	19.2889	20.1690
H2 (MOL %)	0.0406	0.0207	0.0775	0.0427	0.0850	0.0405	0.0374
O2 (MOL %)	0.0001	0.0000	0.0001	0.0000	0.0001	0.0003	0.0000
NH3 (MOL %)	0.0295	0.0166	0.0471	0.0272	0.0511	0.0284	0.0331
OH (MOL %)	0.0036	0.0010	0.0045	0.0006	0.0037	0.0072	0.0020
H (MOL %)	0.0001	0.0000	0.0002	0.0000	0.0002	0.0002	0.0000
CH4 (MOL %)	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.0000
NO (MOL %)	0.0068	0.0020	0.0062	0.0006	0.0048	0.0164	0.0036
C(S) (MOL %)	31.4330	28.8449	34.7312	30.1630	32.0797	27.7350	29.1416
AL(S) (MOL %)	15.7783	24.9321	13.1015	27.7389	15.6540	15.4951	13.0745

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES		PBXN-1 RDX68#DESTEX /AL20/NYLON	TNT/AL/WAX/C	#TRITONAL # TNT 80/AL 20
RHO	(G/CC)	1.810	1.680	1.720
EO	(KCAL/MOLE)	-12.60	-7.00	-5.00
MOL.WEIGHT	(G)	326.676	99.998	100.000
C		4.8919	2.7915	2.4655
H		9.3473	2.3278	1.7611
N		6.4366	0.9875	1.0566
O		6.4366	1.9750	2.1133
AL		2.4224	0.6927	0.7412
DETN.VEL	(M/SEC)	7816.5	6387.9	6629.0
PARTICL.VEL(	")	1743.3	1439.5	1474.7
C-J PRESS	(KBAR)	246.6	154.5	168.1
C-J VOLUME	(CC/G)	0.42927	0.46110	0.45205
C-J TEMP	(DEG K)	2677.7	2734.1	2919.2
C-J S(CAL/DEG MOL)		59.11	71.22	71.65
C-J ENERGY	(CAL/G)	363.17	247.65	259.90
GAMMA		3.484	3.437	3.495
C-J DETN.HEAT(CAL)		1040.5	975.7	1026.7
LAMDA		8.2507	8.5198	9.4230
VOLUM(K LITTRE/KG)		0.6578	0.5098	0.5025
TOTAL PRODCT(MOLE)		15.2031	5.1396	4.6141
V GAS	(MOLES)	8.7841	2.0838	2.0538
V GAS	(CC/MOLE)	11.8951	14.4778	15.1001
V C(S)	(CC/G)	0.27713	0.32159	0.31541
V AL(S)	(CC/G)	0.34336	0.36449	0.36511
H2O	(MOL %)	30.6818	22.4639	18.9372
CO2	(MOL %)	5.7612	7.6246	12.8452
CO	(MOL %)	0.1275	0.7114	1.1644
N2	(MOL %)	21.1552	9.5834	11.4298
H2	(MOL %)	0.0238	0.1115	0.0892
O2	(MOL %)	0.0000	0.0000	0.0001
NH3	(MOL %)	0.0232	0.0454	0.0363
OH	(MOL %)	0.0017	0.0020	0.0041
H	(MOL %)	0.0000	0.0001	0.0002
CH4	(MOL %)	0.0000	0.0004	0.0003
NO	(MOL %)	0.0038	0.0015	0.0044
C(S)	(MOL %)	26.2885	45.9776	39.4241
AL(S)	(MOL %)	15.9333	13.4782	16.0648

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

ALEX 20 RDX/TNT/AL/WAX RHO = 1.8010 G/CC EO = -6.601519E+02 CAL/MOLE

LN P = -3.96634102 E+00 -2.52380085 E+00LN V 4.50731754 E-01LN V*2 -6.30899668 E-02LN V*3 3.23240692 E-03LN V*4

LN T = 7.59041977 E+00 -3.84287238 E-01LN V 1.18509173 E-01LN V*2 -2.07081586 E-02LN V*3 1.26933050 E-03LN V*4

LN E = -1.72749043 E+00 3.58412743 E-01LNP 5.89600764 E-02LN P*2 4.65152040 E-03LN P*3 1.34715927 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (528.712)	0.3402	3747.8 (3534.3)	-1130.0	0.14728 (0.14240)	3.7322	138.8
400.000 (407.624)	0.3650	3407.6 (3362.8)	-835.0	0.13494 (0.13400)	3.6377	645.6
300.000 (299.185)	0.3980	3090.9 (3172.3)	-548.4	0.12295 (0.12476)	3.5252	1223.2
* 230.336 (228.114)	0.4303	2870.7 (3016.5)	-343.6	0.11438 (0.11757)	3.4264	1697.1
200.000 (196.084)	0.4499	2828.7 (2933.9)	-278.2	0.11164 (0.11417)	3.3713	1947.4
100.000 (96.699)	0.5595	2594.2 (2585.6)	-11.6	0.10049 (0.10095)	3.1136	2980.5
80.000 (77.566)	0.6011	2511.3 (2488.7)	57.6	0.09759 (0.09768)	3.0333	3262.4
60.000 (58.532)	0.6607	2400.8 (2372.2)	137.5	0.09425 (0.09401)	2.9309	3598.4
50.000 (48.999)	0.7025	2330.3 (2302.7)	183.1	0.09234 (0.09197)	2.8664	3797.9
40.000 (39.424)	0.7586	2244.7 (2221.8)	234.2	0.09020 (0.08973)	2.7876	4029.5
30.000 (29.801)	0.8403	2139.2 (2123.8)	291.7	0.08780 (0.08720)	2.6865	4309.4
20.000 (20.137)	0.9762	1997.7 (1997.7)	362.8	0.08482 (0.08423)	2.5457	4670.4
10.000 (10.191)	1.2930	1793.8 (1806.5)	457.7	0.08085 (0.08035)	2.3044	5225.2
8.000 (8.177)	1.4250	1737.4 (1751.6)	483.4	0.07977 (0.07935)	2.2277	5388.1
6.000 (6.138)	1.6256	1672.0 (1684.7)	512.8	0.07855 (0.07820)	2.1290	5589.9
5.000 (5.111)	1.7738	1634.0 (1644.7)	529.8	0.07783 (0.07754)	2.0669	5713.1
4.000 (4.082)	1.9818	1590.4 (1598.2)	549.5	0.07701 (0.07679)	1.9916	5859.2
3.000 (3.049)	2.3027	1538.6 (1542.2)	573.1	0.07602 (0.07590)	1.8961	6040.8
2.000 (2.018)	2.8855	1472.6 (1470.3)	603.4	0.07475 (0.07478)	1.7657	6284.7
1.000 (0.996)	4.4177	1376.5 (1365.6)	647.8	0.07289 (0.07307)	1.5599	6674.0
0.800 (0.795)	5.1188	1348.1 (1336.4)	661.4	0.07233 (0.07255)	1.5002	6792.5
0.600 (0.595)	6.2389	1313.1 (1301.5)	678.3	0.07162 (0.07189)	1.4285	6941.6
0.500 (0.495)	7.1059	1291.5 (1280.7)	688.8	0.07118 (0.07148)	1.3864	7034.4
0.400 (0.396)	8.3754	1265.9 (1256.5)	701.5	0.07065 (0.07097)	1.3387	7146.6
0.300 (0.297)	10.4369	1233.6 (1226.9)	717.5	0.06998 (0.07032)	1.2839	7289.1
0.200 (0.198)	14.4356	1189.4 (1187.5)	739.7	0.06905 (0.06938)	1.2201	7486.8
0.100 (0.099)	25.8765	1117.0 (1122.9)	776.5	0.06751 (0.06775)	1.1491	7816.4
0.080 (0.080)	31.3937	1094.6 (1102.1)	787.9	0.06703 (0.06722)	1.1358	7920.4
0.060 (0.060)	40.3666	1066.4 (1075.0)	802.3	0.06643 (0.06654)	1.1246	8052.9
0.050 (0.050)	47.3784	1048.8 (1057.7)	811.3	0.06605 (0.06610)	1.1206	8136.0
0.040 (0.040)	57.6916	1027.7 (1036.1)	822.1	0.06560 (0.06558)	1.1184	8236.9
0.030 (0.030)	74.4300	1001.1 (1007.9)	835.6	0.06504 (0.06491)	1.1192	8365.7
0.020 (0.020)	106.6831	964.7 (967.8)	854.0	0.06427 (0.06401)	1.1249	8544.6
0.010 (0.010)	197.5436	904.5 (900.4)	883.8	0.06302 (0.06264)	1.1375	8842.7
0.008 (0.008)	240.9128	885.7 (879.8)	892.8	0.06264 (0.06227)	1.1399	8936.5
0.006 (0.006)	311.0903	861.8 (854.7)	904.2	0.06217 (0.06185)	1.1402	9055.4
0.005 (0.005)	365.7102	846.7 (839.9)	911.3	0.06187 (0.06163)	1.1381	9129.5
0.004 (0.004)	445.7798	828.5 (823.2)	919.7	0.06152 (0.06141)	1.1328	9219.0
0.003 (0.003)	575.2302	805.3 (804.3)	930.2	0.06108 (0.06122)	1.1204	9332.1
0.002 (0.002)	823.3057	773.0 (784.0)	944.5	0.06048 (0.06117)	1.0901	9486.8

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

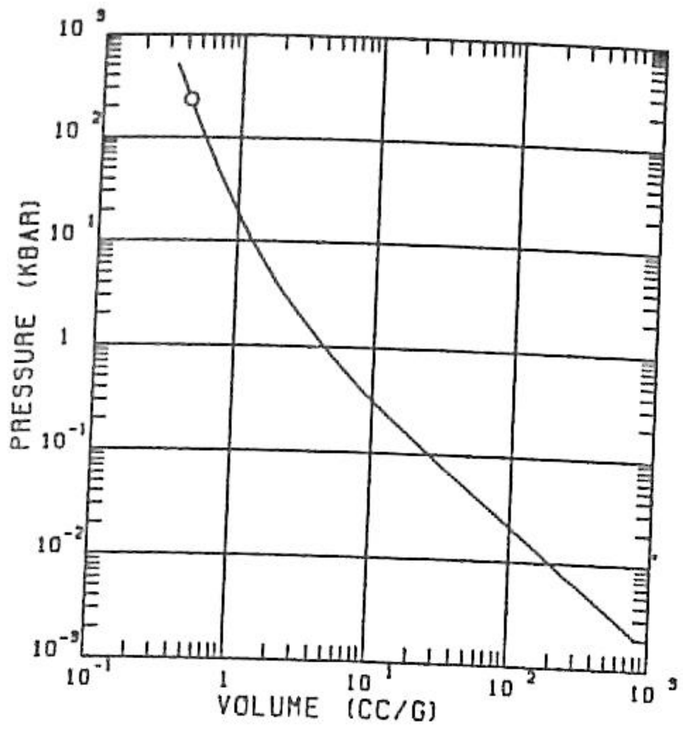
********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

ALEX 20 RDX/TNT/AL/WAX RHO = 1.8010 G/CC EO = -6.601519E+02 CAL/MOLE

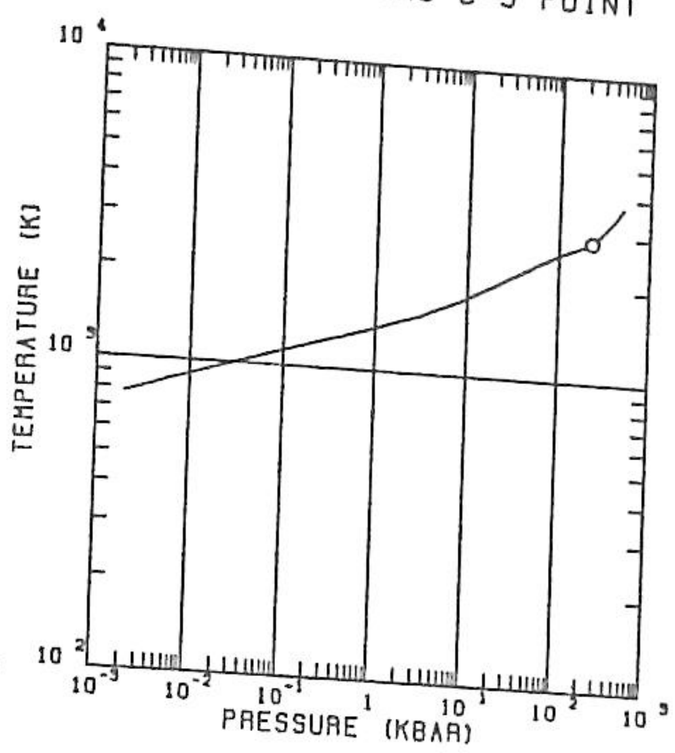
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

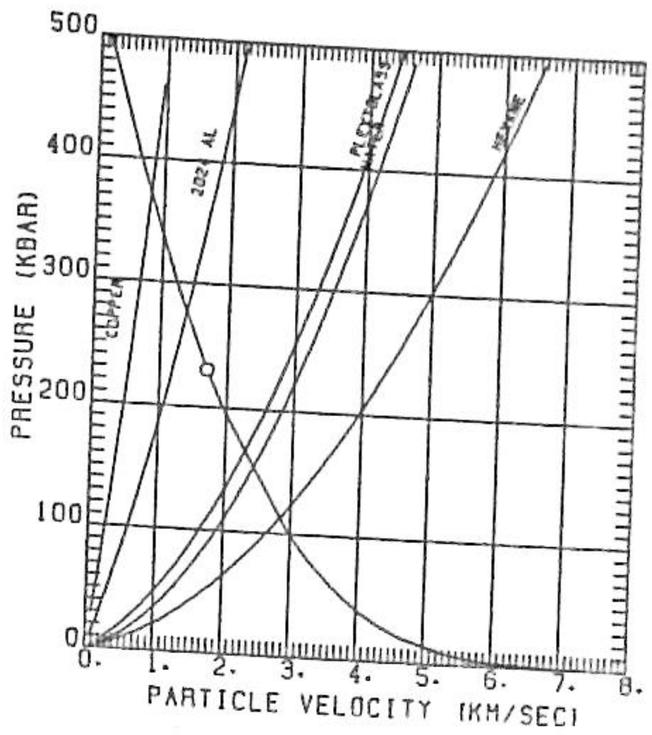
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	NO	C(S)	AL(S)
230.336	1.23654	0.39332	0.01550	0.80608	0.00191	0.00000	0.00138	0.00017	0.00000	0.00000	0.00031	1.46184	0.73384
200.000	1.23454	0.39099	0.02235	0.80586	0.00310	0.00000	0.00192	0.00015	0.00001	0.00000	0.00021	1.45732	0.73384
100.000	1.20852	0.36998	0.09064	0.80339	0.02097	0.00000	0.00705	0.00007	0.00001	0.00025	0.00003	1.40980	0.73384
80.000	1.19154	0.36127	0.12507	0.80213	0.03326	0.00000	0.00958	0.00005	0.00001	0.00071	0.00001	1.38362	0.73384
60.000	1.16192	0.35116	0.17495	0.80036	0.05457	0.00000	0.01314	0.00003	0.00001	0.00220	0.00001	1.34237	0.73384
50.000	1.13840	0.34626	0.20830	0.79924	0.07095	0.00000	0.01538	0.00002	0.00001	0.00409	0.00000	1.31204	0.73384
40.000	1.10471	0.34260	0.24929	0.79799	0.09314	0.00000	0.01788	0.00001	0.00001	0.00797	0.00000	1.27082	0.73384
30.000	1.05569	0.34233	0.29888	0.79682	0.12266	0.00000	0.02021	0.00001	0.00001	0.01598	0.00000	1.21350	0.73384
20.000	0.97304	0.35073	0.36475	0.79594	0.16259	0.00000	0.02198	0.00000	0.00001	0.03601	0.00000	1.11919	0.73384
10.000	0.82571	0.38196	0.44963	0.79675	0.21023	0.00000	0.02036	0.00000	0.00000	0.08707	0.00000	0.95204	0.73384
8.000	0.78334	0.39450	0.46696	0.79737	0.21925	0.00000	0.01912	0.00000	0.00000	0.10467	0.00000	0.90456	0.73384
6.000	0.73333	0.41052	0.48491	0.79824	0.22836	0.00000	0.01738	0.00000	0.00000	0.12642	0.00000	0.84883	0.73384
5.000	0.70519	0.42052	0.49305	0.79880	0.23280	0.00000	0.01627	0.00000	0.00000	0.13911	0.00000	0.81801	0.73384
4.000	0.67478	0.43266	0.49921	0.79946	0.23703	0.00000	0.01493	0.00000	0.00000	0.15320	0.00000	0.78561	0.73384
3.000	0.64165	0.44780	0.50206	0.80027	0.24120	0.00000	0.01332	0.00000	0.00000	0.16889	0.00000	0.75195	0.73384
2.000	0.60536	0.46823	0.49743	0.80127	0.24546	0.00000	0.01132	0.00000	0.00000	0.18641	0.00000	0.71861	0.73384
1.000	0.56394	0.49950	0.47631	0.80264	0.25200	0.00000	0.00859	0.00000	0.00000	0.20590	0.00000	0.68896	0.73384
0.800	0.55572	0.50938	0.46473	0.80300	0.25350	0.00000	0.00787	0.00000	0.00000	0.20980	0.00000	0.68677	0.73384
0.600	0.54810	0.52182	0.44747	0.80342	0.25533	0.00000	0.00703	0.00000	0.00000	0.21332	0.00000	0.68806	0.73384
0.500	0.54491	0.52958	0.43515	0.80366	0.25639	0.00000	0.00654	0.00000	0.00000	0.21475	0.00000	0.69121	0.73384
0.400	0.54256	0.53887	0.41892	0.80394	0.25769	0.00000	0.00599	0.00000	0.00000	0.21569	0.00000	0.69719	0.73384
0.300	0.54182	0.55058	0.39624	0.80426	0.25927	0.00000	0.00535	0.00000	0.00000	0.21575	0.00000	0.70811	0.73384
0.200	0.54462	0.56652	0.36157	0.80466	0.26121	0.00000	0.00455	0.00000	0.00000	0.21399	0.00000	0.72859	0.73384
0.100	0.55693	0.59207	0.29816	0.80522	0.26305	0.00000	0.00342	0.00000	0.00000	0.20775	0.00000	0.77269	0.73384
0.080	0.56213	0.59963	0.27784	0.80538	0.26322	0.00000	0.00312	0.00000	0.00000	0.20529	0.00000	0.78790	0.73384
0.060	0.56952	0.60892	0.25188	0.80555	0.26289	0.00000	0.00277	0.00000	0.00000	0.20203	0.00000	0.80785	0.73384
0.050	0.57459	0.61455	0.23556	0.80565	0.26226	0.00000	0.00256	0.00000	0.00000	0.19996	0.00000	0.82060	0.73384
0.040	0.58094	0.62100	0.21630	0.80577	0.26126	0.00000	0.00233	0.00000	0.00000	0.19746	0.00000	0.83592	0.73384
0.030	0.58955	0.62869	0.19232	0.80590	0.25933	0.00000	0.00207	0.00000	0.00000	0.19432	0.00000	0.85535	0.73384
0.020	0.60239	0.63821	0.16045	0.80607	0.25526	0.00000	0.00174	0.00000	0.00000	0.19018	0.00000	0.88184	0.73384
0.010	0.62657	0.65038	0.11193	0.80629	0.24386	0.00000	0.00130	0.00000	0.00000	0.18412	0.00000	0.92423	0.73384
0.008	0.63490	0.65303	0.09831	0.80635	0.23910	0.00000	0.00118	0.00000	0.00000	0.18243	0.00000	0.93689	0.73384
0.006	0.64621	0.65548	0.08210	0.80642	0.23194	0.00000	0.00104	0.00000	0.00000	0.18046	0.00000	0.95263	0.73384
0.005	0.65379	0.65644	0.07260	0.80646	0.22671	0.00000	0.00096	0.00000	0.00000	0.17934	0.00000	0.96230	0.73384
0.004	0.66335	0.65697	0.06200	0.80651	0.21986	0.00000	0.00087	0.00000	0.00000	0.17806	0.00000	0.97366	0.73384
0.003	0.67628	0.65660	0.04982	0.80656	0.21006	0.00000	0.00077	0.00000	0.00000	0.17657	0.00000	0.98770	0.73384
0.002	0.69583	0.65402	0.03543	0.80662	0.19440	0.00000	0.00064	0.00000	0.00000	0.17472	0.00000	1.00650	0.73384
300.000	1.23799	0.39474	0.01033	0.80596	0.00102	0.00002	0.00096	0.00033	0.00000	0.00000	0.00097	1.46560	0.73384
400.000	1.23854	0.39439	0.00747	0.80486	0.00058	0.00013	0.00075	0.00072	0.00001	0.00000	0.00338	1.46880	0.73384
500.000	1.23828	0.39148	0.00689	0.80217	0.00046	0.00045	0.00078	0.00139	0.00001	0.00000	0.00873	1.47230	0.73384

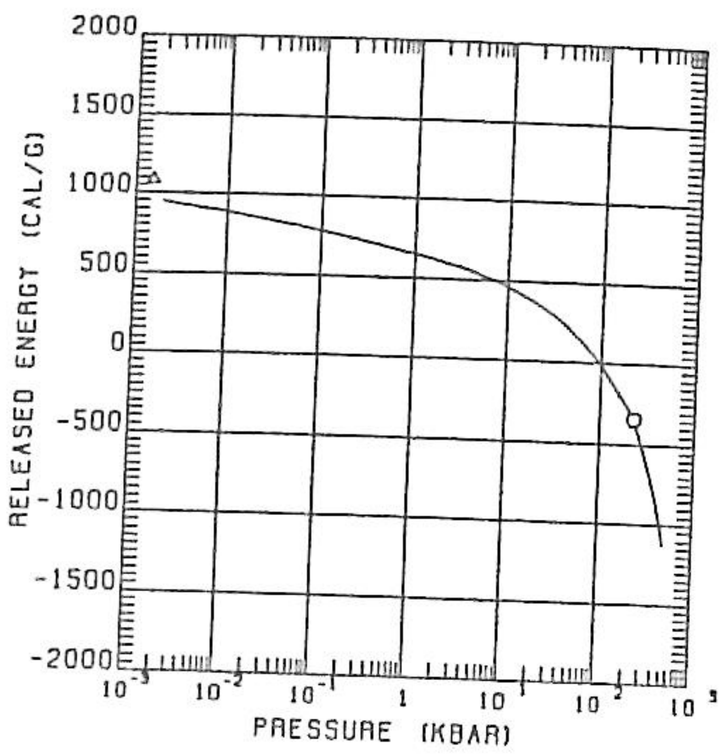
PRESS ;KBAR, PRODUCTS ;MOLES

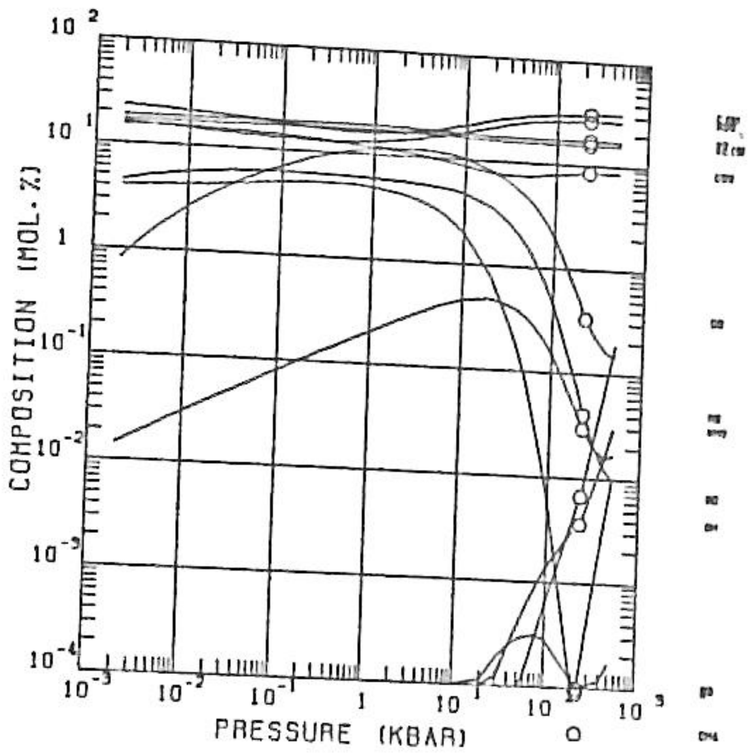


K-H-T ISENTROPE THRU C-J POINT









ALEX 20 RDX/TNT/AL/WAX

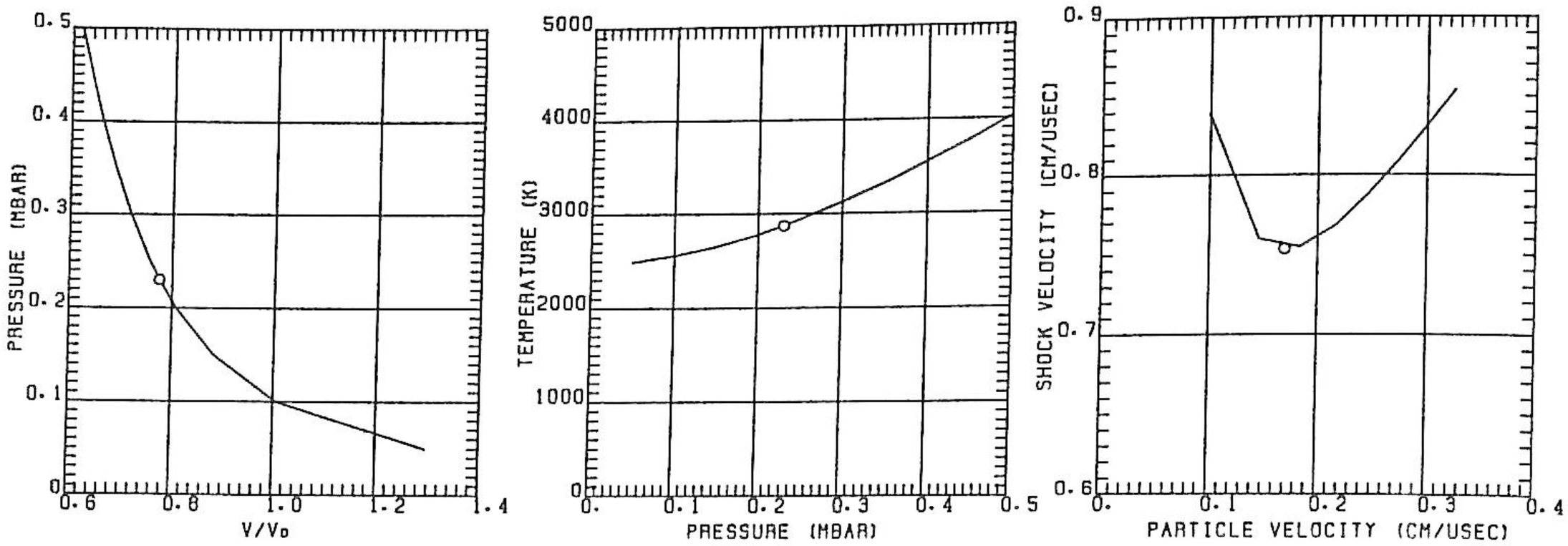
RHO (G/CC)	1.801
E_0 (KCAL/MOLE)	-0.66
D_{C-J}(M/SEC)	7536.
P_{C-J}(KBAR)	230.3
T_{C-J}(K)	2871.

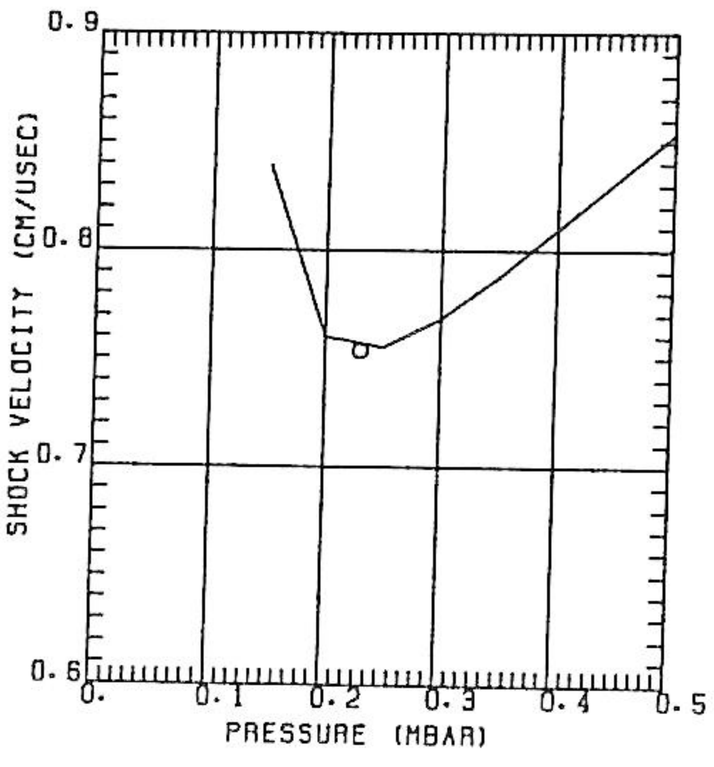
DATE 82-11-02

********** A K-H-T H U G O N I O T <<DATE 82-11-02>>**********

ALEX 20 RDX/TNT/AL/WAX RHO = 1.8010 G/CC, EO = -6.601519E+02 CAL/MOLE

PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3438	0.3548	0.3671	0.3814	0.3985	0.4200	0.4485	0.4895	0.5581	0.7195
TEMP (DEG K)	4028.1	3779.6	3544.9	3324.4	3120.4	2936.3	2777.2	2650.8	2562.9	2487.0
US (M/SEC)	8537.4	8318.7	8096.0	7878.3	7682.6	7549.8	7599.5	8389.8	0.0	0.0
UP (M/SEC)	3251.8	3003.6	2743.3	2466.7	2168.2	1838.6	1461.3	992.7	0.0	0.0
H2O (MOLE)	1.2365	1.2373	1.2378	1.2380	1.2378	1.2371	1.2353	1.2301	1.2107	1.0990
CO2 (MOLE)	0.3868	0.3904	0.3927	0.3940	0.3944	0.3939	0.3921	0.3871	0.3721	0.3229
CO (MOLE)	0.0118	0.0106	0.0101	0.0102	0.0111	0.0136	0.0194	0.0348	0.0842	0.2944
N2 (MOLE)	0.7997	0.8024	0.8042	0.8053	0.8059	0.8061	0.8060	0.8054	0.8036	0.7972
H2 (MOLE)	0.0009	0.0008	0.0008	0.0009	0.0011	0.0016	0.0027	0.0060	0.0195	0.0994
O2 (MOLE)	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0013	0.0011	0.0010	0.0010	0.0010	0.0012	0.0017	0.0030	0.0067	0.0195
OH (MOLE)	0.0025	0.0017	0.0010	0.0006	0.0004	0.0002	0.0001	0.0001	0.0001	0.0000
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0064
NO (MOLE)	0.0132	0.0080	0.0044	0.0022	0.0010	0.0004	0.0002	0.0001	0.0000	0.0000
C(S) (MOLE)	1.4721	1.4697	1.4679	1.4665	1.4652	1.4632	1.4591	1.4487	1.4141	1.2470
AL(S) (MOLE)	0.7338	0.7338	0.7338	0.7338	0.7338	0.7338	0.7338	0.7338	0.7338	0.7338





ALEX 20 RDX/TNT/AL/WAX
RHO (G/CC) 1.801
E_0 (KCAL/MOLE) -0.66

DATE 82-11-02

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC EO = -8.874150E+02 CAL/MOLE

LN P = -4.23083019 E+00 -2.57838345 E+00LN V 5.28997958 E-01LN V*2 -8.34234953 E-02LN V*3 4.79916111 E-03LN V*4

LN T = 7.51933384 E+00 -3.46119225 E-01LN V 1.14089489 E-01LN V*2 -2.14270949 E-02LN V*3 1.39925722 E-03LN V*4

LN E = -1.78506947 E+00 3.17577183 E-01LNP 5.41024692 E-02LN P*2 4.35654819 E-03LN P*3 1.28037835 E-04LN P*4

(P; MBARS, T; DEG KELVIN, V ; CC/G, E ; MBAR CC/G)

THE CONSTANT ADDED TO ENERGIES WAS 0.100000E+00

PRESSURE (KBAR)	VOLUME (CC/G)	TEMPERATURE (DEG KELVIN)	ENERGY (CAL/G)	ENERGY + CONSTANT (MBAR CC/G))	GAMMA	MASS VELOC. (M/SEC)
500.000 (521.312)	0.3341	3448.3 (3184.9)	-1027.6	0.14300 (0.13798)	4.0644	23.3
400.000 (403.015)	0.3562	3129.1 (3051.2)	-761.9	0.13188 (0.13082)	3.9581	502.4
300.000 (296.510)	0.3854	2834.0 (2900.7)	-505.3	0.12114 (0.12291)	3.8311	1047.2
* 219.194 (215.737)	0.4194	2598.8 (2754.7)	-294.3	0.11231 (0.11567)	3.6992	1570.7
200.000 (195.685)	0.4307	2578.8 (2711.8)	-260.1	0.11088 (0.11380)	3.6587	1721.0
100.000 (96.853)	0.5262	2408.7 (2427.2)	-41.3	0.10173 (0.10238)	3.3659	2683.0
80.000 (77.928)	0.5618	2347.4 (2347.4)	15.2	0.09936 (0.09956)	3.2752	2942.3
60.000 (59.012)	0.6126	2263.7 (2250.6)	80.5	0.09663 (0.09639)	3.1593	3251.5
50.000 (49.497)	0.6481	2208.7 (2192.4)	118.1	0.09506 (0.09464)	3.0860	3435.2
40.000 (39.895)	0.6957	2140.4 (2123.9)	160.4	0.09329 (0.09271)	2.9962	3648.8
30.000 (30.547)	0.7618	2053.6 (2043.4)	208.2	0.09129 (0.09054)	2.8851	3897.0
20.000 (20.597)	0.8768	1933.4 (1933.0)	268.3	0.08877 (0.08801)	2.7218	4234.1
10.000 (10.308)	1.1470	1754.0 (1761.5)	349.4	0.08538 (0.08475)	2.4379	4755.1
8.000 (8.231)	1.2602	1703.3 (1711.5)	371.5	0.08446 (0.08391)	2.3468	4908.2
6.000 (6.142)	1.4322	1644.0 (1650.4)	396.9	0.08340 (0.08296)	2.2297	5097.3
5.000 (5.096)	1.5595	1609.5 (1613.6)	411.5	0.08278 (0.08241)	2.1560	5212.6
4.000 (4.053)	1.7383	1569.6 (1570.8)	428.5	0.08207 (0.08180)	2.0667	5349.0
3.000 (3.014)	2.0144	1521.8 (1519.1)	448.9	0.08122 (0.08107)	1.9536	5517.9
2.000 (1.985)	2.5169	1460.6 (1452.8)	475.2	0.08012 (0.08015)	1.8000	5744.1
1.000 (0.978)	3.8417	1370.7 (1356.3)	513.8	0.07850 (0.07874)	1.5610	6103.3
0.800 (0.783)	4.4427	1342.4 (1329.8)	526.8	0.07796 (0.07830)	1.4935	6211.2
0.600 (0.586)	5.4216	1310.7 (1297.5)	540.4	0.07739 (0.07774)	1.4124	6349.5
0.500 (0.491)	6.1654	1288.8 (1278.7)	550.8	0.07695 (0.07738)	1.3665	6433.9
0.400 (0.393)	7.2808	1265.9 (1256.3)	560.7	0.07654 (0.07694)	1.3142	6538.2
0.300 (0.296)	9.0791	1235.1 (1229.2)	574.7	0.07595 (0.07637)	1.2563	6669.8
0.200 (0.199)	12.5764	1192.9 (1192.8)	594.2	0.07514 (0.07554)	1.1924	6853.0
0.100 (0.101)	22.6229	1123.5 (1132.2)	626.7	0.07378 (0.07405)	1.1307	7160.9
0.080 (0.081)	27.4808	1102.0 (1112.4)	636.7	0.07336 (0.07356)	1.1221	7258.8
0.060 (0.061)	35.3972	1075.0 (1086.2)	649.5	0.07283 (0.07293)	1.1176	7384.1
0.050 (0.051)	41.5925	1058.1 (1069.3)	657.5	0.07249 (0.07252)	1.1178	7462.9
0.040 (0.041)	50.7198	1037.9 (1048.1)	667.0	0.07209 (0.07204)	1.1206	7558.9
0.030 (0.031)	65.5597	1012.4 (1020.4)	679.0	0.07159 (0.07142)	1.1269	7681.5
0.020 (0.020)	94.2380	977.6 (980.7)	695.4	0.07091 (0.07058)	1.1374	7852.3
0.010 (0.010)	175.4405	920.4 (914.5)	722.0	0.06979 (0.06933)	1.1453	8136.2
0.008 (0.008)	214.3381	902.6 (894.6)	730.2	0.06945 (0.06900)	1.1414	8225.0
0.006 (0.006)	277.4692	880.1 (870.9)	740.5	0.06902 (0.06865)	1.1292	8337.4
0.005 (0.005)	326.7266	865.9 (857.2)	746.9	0.06875 (0.06847)	1.1166	8407.1
0.004 (0.004)	399.1082	848.9 (842.1)	754.5	0.06843 (0.06831)	1.0950	8491.0
0.003 (0.003)	516.4797	827.2 (826.1)	764.0	0.06803 (0.06821)	1.0560	8596.4
0.002 (0.002)	742.4460	797.1 (811.8)	777.0	0.06749 (0.06830)	0.9758	8739.8

* ; C-J POINT, ( ); VARIABLES COMPUTED FROM LEAST SQUARES FIT

********** A K-H-T I S E N T R O P E T H R U C-J P R E S S U R E <<DATE 82-11-02>> **********

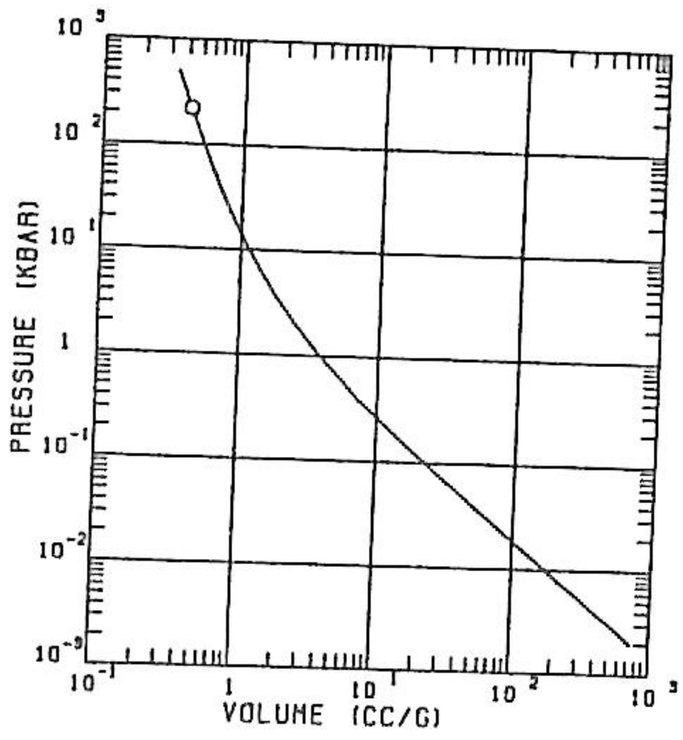
ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC ED = -8.874150E+02 CAL/MOLE

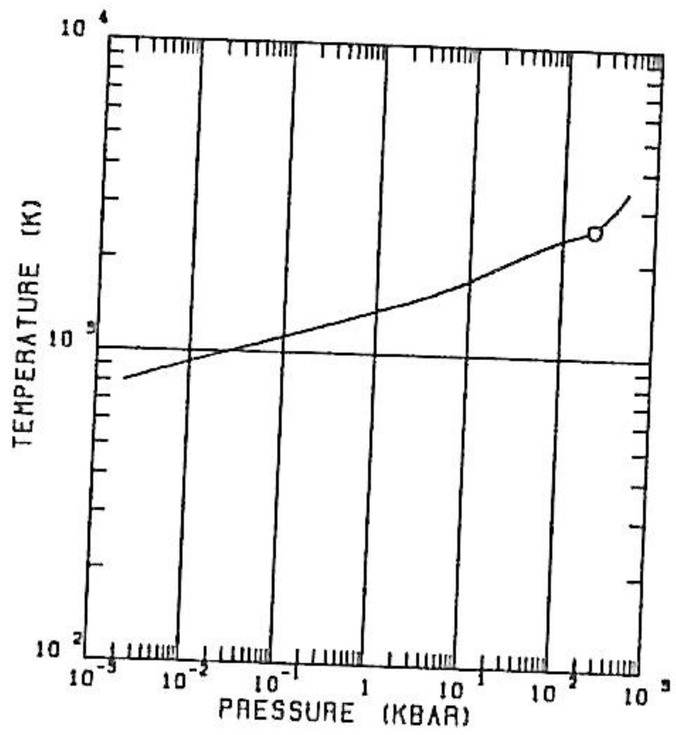
THE ISENTREOPE PRESSURE AND COMPOSITION OF DETONATION PRODUCTS

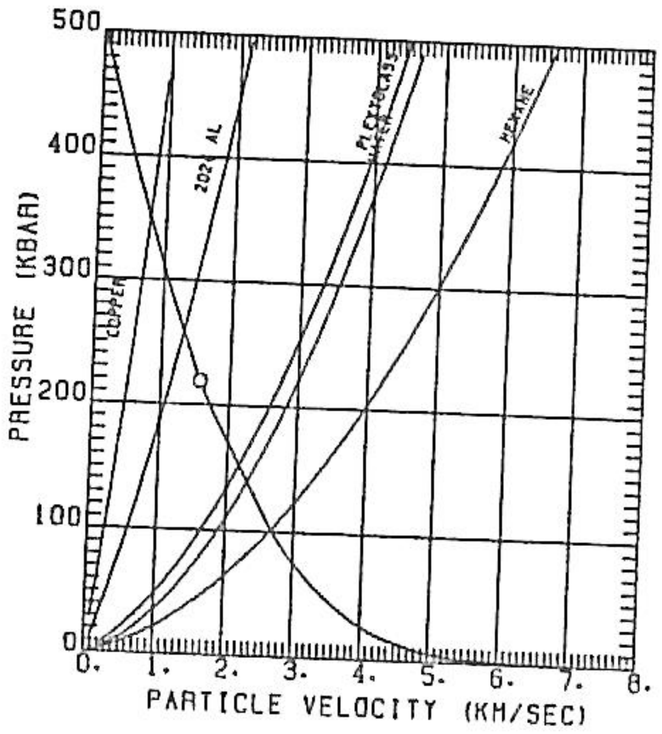
PRESS	H2O	CO2	CO	N2	H2	O2	NH3	OH	H	CH4	ND	C(S)	AL(S)
219.194	1.10091	0.31828	0.00702	0.68830	0.00096	0.00000	0.00077	0.00005	0.00000	0.00000	0.00009	1.32063	1.14152
200.000	1.10019	0.31760	0.00913	0.68820	0.00136	0.00000	0.00098	0.00005	0.00000	0.00000	0.00007	1.31920	1.14152
100.000	1.08402	0.30688	0.04690	0.68646	0.01199	0.00000	0.00453	0.00002	0.00000	0.00011	0.00001	1.29204	1.14152
80.000	1.07228	0.30188	0.06868	0.68547	0.02025	0.00000	0.00652	0.00002	0.00000	0.00036	0.00001	1.27501	1.14152
60.000	1.05032	0.29567	0.10304	0.68395	0.03578	0.00000	0.00955	0.00001	0.00001	0.00130	0.00000	1.24592	1.14152
50.000	1.03196	0.29263	0.12746	0.68293	0.04842	0.00000	0.01160	0.00001	0.00001	0.00263	0.00000	1.22320	1.14152
40.000	1.00456	0.29061	0.15894	0.68172	0.06633	0.00000	0.01401	0.00000	0.00000	0.00556	0.00000	1.19081	1.14152
30.000	0.96278	0.29142	0.19910	0.68049	0.09131	0.00000	0.01647	0.00000	0.00000	0.01212	0.00000	1.14329	1.14152
20.000	0.88903	0.30011	0.25551	0.67941	0.12679	0.00000	0.01863	0.00000	0.00000	0.02964	0.00000	1.06068	1.14152
10.000	0.75121	0.32917	0.33519	0.67982	0.17171	0.00000	0.01781	0.00000	0.00000	0.07670	0.00000	0.90486	1.14152
8.000	0.71052	0.34027	0.35369	0.68033	0.18089	0.00000	0.01680	0.00000	0.00000	0.09321	0.00000	0.85876	1.14152
6.000	0.66262	0.35423	0.37364	0.68106	0.19031	0.00000	0.01533	0.00000	0.00000	0.11356	0.00000	0.80449	1.14152
5.000	0.63545	0.36276	0.38380	0.68155	0.19515	0.00000	0.01437	0.00000	0.00000	0.12544	0.00000	0.77394	1.14152
4.000	0.60609	0.37285	0.39295	0.68212	0.19997	0.00000	0.01321	0.00000	0.00000	0.13858	0.00000	0.74158	1.14152
3.000	0.57408	0.38521	0.40024	0.68283	0.20496	0.00000	0.01181	0.00000	0.00000	0.15315	0.00000	0.70735	1.14152
2.000	0.53874	0.40146	0.40307	0.68371	0.21056	0.00000	0.01004	0.00000	0.00000	0.16934	0.00000	0.67207	1.14152
1.000	0.49803	0.42563	0.39538	0.68491	0.21927	0.00000	0.00764	0.00000	0.00000	0.18714	0.00000	0.63780	1.14152
0.800	0.49078	0.43419	0.38552	0.68524	0.22046	0.00000	0.00699	0.00000	0.00000	0.19066	0.00000	0.63557	1.14152
0.600	0.48180	0.44270	0.37752	0.68560	0.22433	0.00000	0.00626	0.00000	0.00000	0.19377	0.00000	0.63193	1.14152
0.500	0.47926	0.44960	0.36623	0.68582	0.22492	0.00000	0.00582	0.00000	0.00000	0.19507	0.00000	0.63504	1.14152
0.400	0.47530	0.45567	0.35806	0.68606	0.22815	0.00000	0.00534	0.00000	0.00000	0.19579	0.00000	0.63640	1.14152
0.300	0.47360	0.46460	0.34194	0.68635	0.23084	0.00000	0.00477	0.00000	0.00000	0.19573	0.00000	0.64369	1.14152
0.200	0.47467	0.47681	0.31645	0.68671	0.23446	0.00000	0.00406	0.00000	0.00000	0.19392	0.00000	0.65877	1.14152
0.100	0.48318	0.49669	0.26819	0.68720	0.23964	0.00000	0.00306	0.00000	0.00000	0.18782	0.00000	0.69324	1.14152
0.080	0.48703	0.50268	0.25235	0.68734	0.24098	0.00000	0.00279	0.00000	0.00000	0.18543	0.00000	0.70548	1.14152
0.060	0.49254	0.51013	0.23194	0.68750	0.24236	0.00000	0.00248	0.00000	0.00000	0.18223	0.00000	0.72163	1.14152
0.050	0.49632	0.51473	0.21895	0.68759	0.24289	0.00000	0.00230	0.00000	0.00000	0.18020	0.00000	0.73205	1.14152
0.040	0.50109	0.52006	0.20353	0.68769	0.24340	0.00000	0.00209	0.00000	0.00000	0.17771	0.00000	0.74464	1.14152
0.030	0.50754	0.52656	0.18408	0.68781	0.24357	0.00000	0.00185	0.00000	0.00000	0.17458	0.00000	0.76072	1.14152
0.020	0.51713	0.53487	0.15787	0.68796	0.24281	0.00000	0.00156	0.00000	0.00000	0.17038	0.00000	0.78280	1.14152
0.010	0.53509	0.54645	0.11677	0.68816	0.23818	0.00000	0.00117	0.00000	0.00000	0.16402	0.00000	0.81869	1.14152
0.008	0.54125	0.54935	0.10481	0.68821	0.23581	0.00000	0.00106	0.00000	0.00000	0.16220	0.00000	0.82956	1.14152
0.006	0.54957	0.55241	0.09038	0.68827	0.23202	0.00000	0.00094	0.00000	0.00000	0.16003	0.00000	0.84311	1.14152
0.005	0.55514	0.55396	0.08171	0.68831	0.22905	0.00000	0.00087	0.00000	0.00000	0.15878	0.00000	0.85148	1.14152
0.004	0.56209	0.55540	0.07187	0.68835	0.22509	0.00000	0.00079	0.00000	0.00000	0.15734	0.00000	0.86131	1.14152
0.003	0.57155	0.55650	0.06023	0.68839	0.21915	0.00000	0.00070	0.00000	0.00000	0.15565	0.00000	0.87355	1.14152
0.002	0.58581	0.55655	0.04587	0.68845	0.20918	0.00000	0.00059	0.00000	0.00000	0.15359	0.00000	0.88992	1.14152
300.000	1.10184	0.31901	0.00425	0.68830	0.00044	0.00001	0.00047	0.00011	0.00000	0.00000	0.00039	1.32267	1.14152
400.000	1.10212	0.31876	0.00308	0.68778	0.00024	0.00005	0.00036	0.00027	0.00000	0.00000	0.00154	1.32409	1.14152
500.000	1.10200	0.31718	0.00291	0.68634	0.00019	0.00020	0.00038	0.00058	0.00000	0.00000	0.00440	1.32584	1.14152

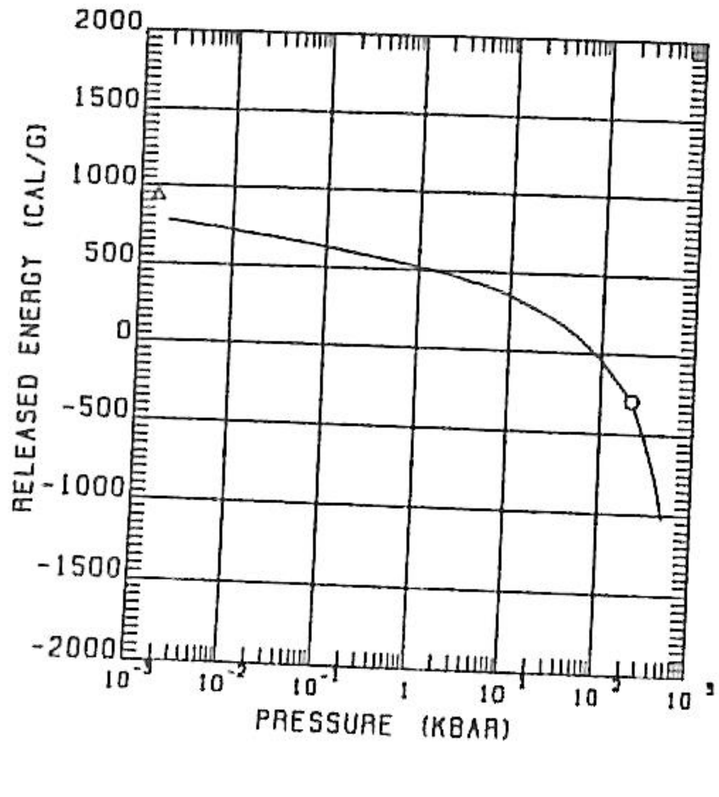
PRESS ;KBAR, PRODUCTS ;MOLES

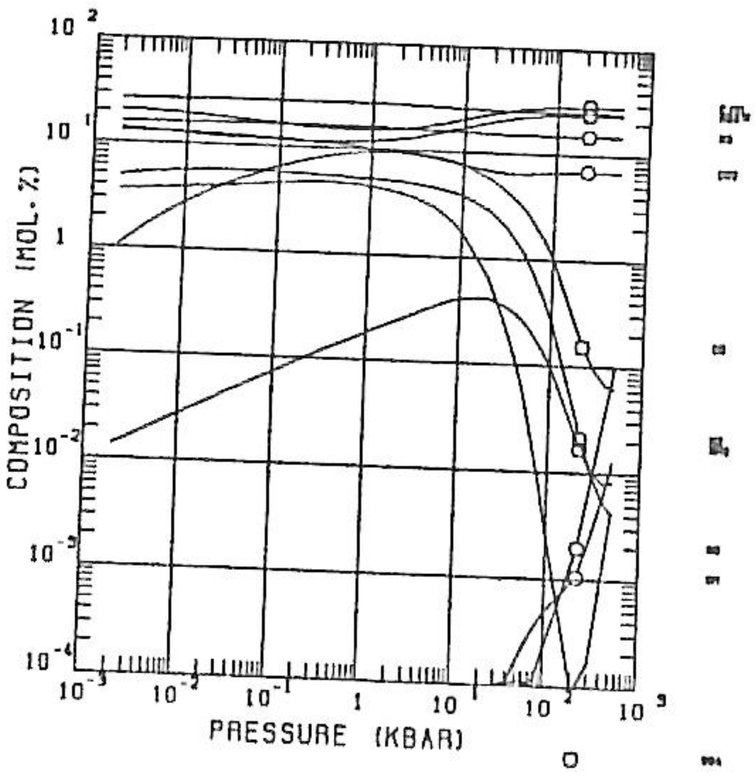
K-H-T ISENTROPE THRU C-J POINT











ALEX 32 RDX/TNT/AL/WAX

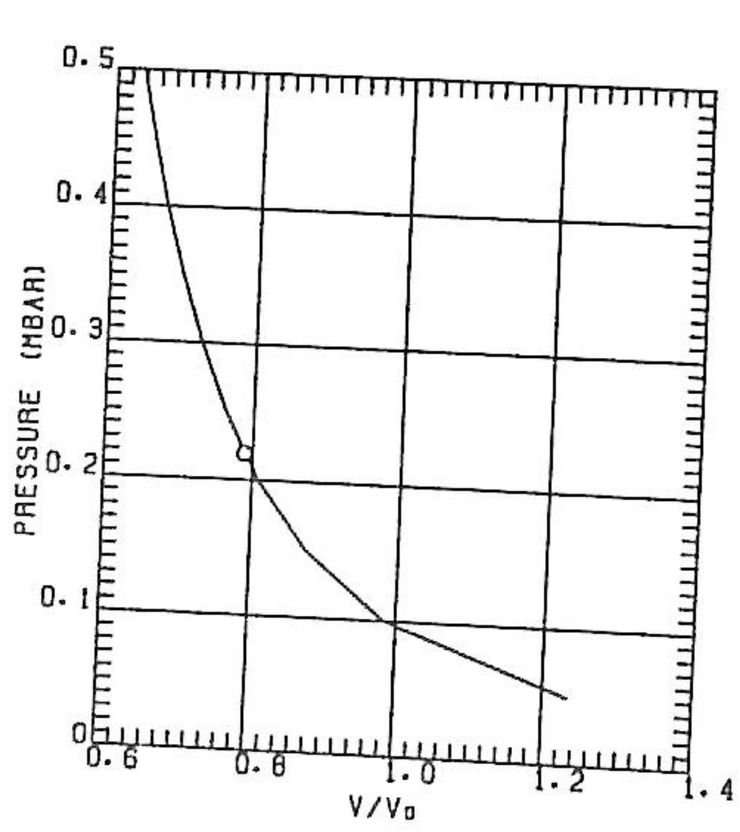
RHO (G/CC)	1.880
E_0 (KCAL/MOLE)	-0.89
D_{C-J} (M/SEC)	7423.
P_{C-J} (KBAR)	219.2
T_{C-J} (K)	2599.

DATE 82-11-02

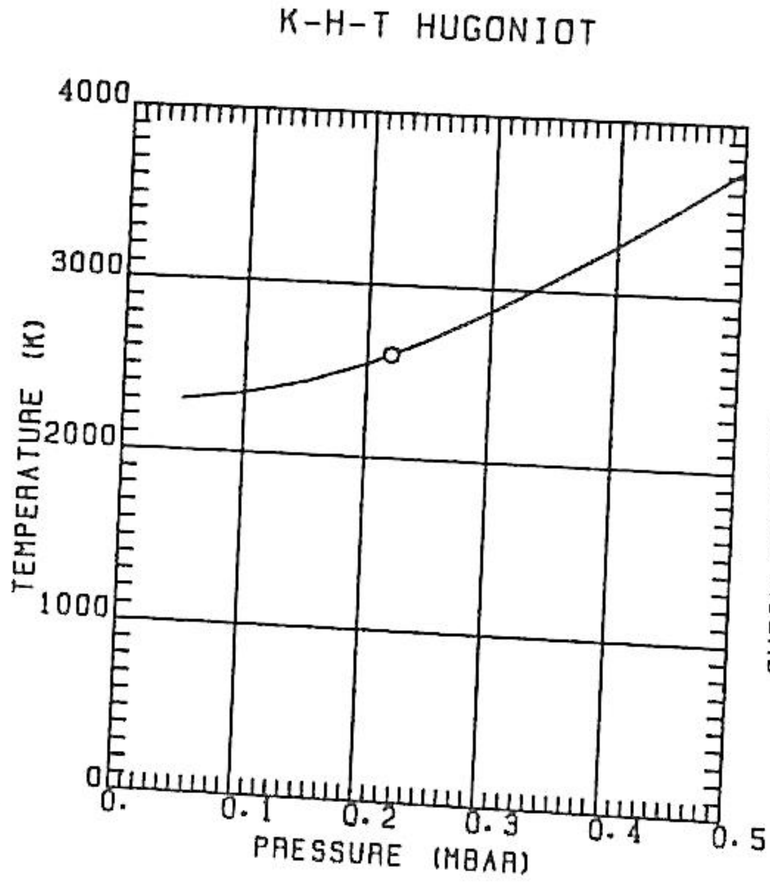
********** A K-H-T H U G O N I O T <<DATE 82-11-02>>**********

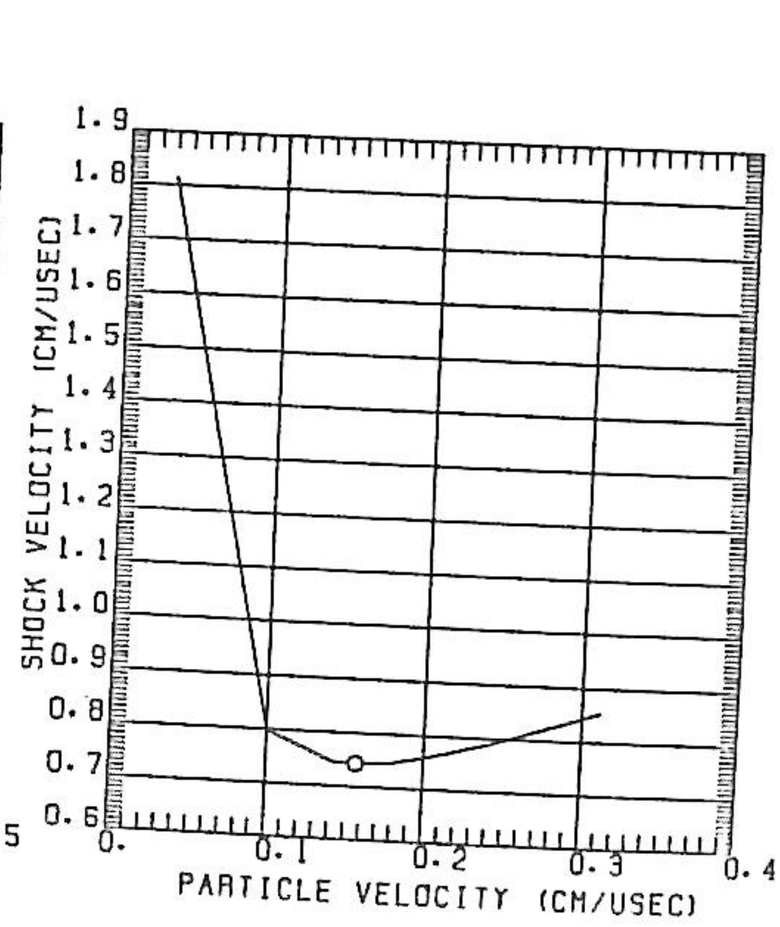
ALEX 32 RDX/TNT/AL/WAX RHO = 1.8800 G/CC, EO = -8.874150E+02 CAL/MOLE

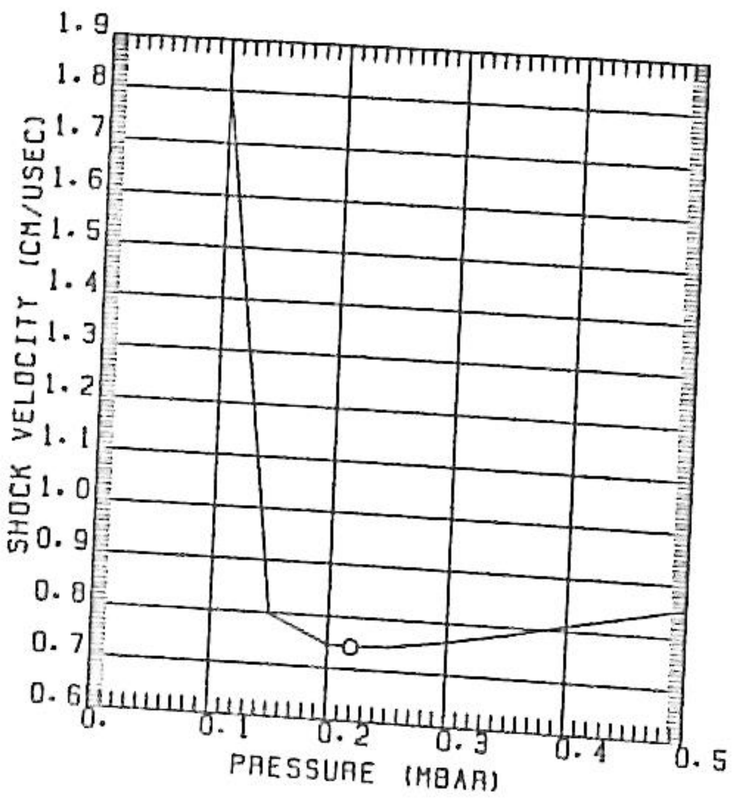
PRESSURE (KBAR)	500.000	450.000	400.000	350.000	300.000	250.000	200.000	150.000	100.000	50.000
VOLUME (CC/G)	0.3378	0.3476	0.3585	0.3711	0.3862	0.4050	0.4298	0.4653	0.5233	0.6557
TEMP (DEG K)	3728.5	3495.0	3273.8	3065.7	2872.1	2696.2	2543.1	2421.1	2340.7	2295.9
US (M/SEC)	8537.4	8310.4	8077.5	7846.5	7631.3	7465.6	7444.8	7980.5	18145.7	0.0
UP (M/SEC)	3115.2	2880.2	2634.1	2372.6	2091.0	1781.2	1428.9	999.8	293.1	0.0
H2O (MOLE)	1.1010	1.1015	1.1017	1.1018	1.1017	1.1014	1.1005	1.0978	1.0871	1.0160
CO2 (MOLE)	0.3145	0.3166	0.3179	0.3185	0.3188	0.3186	0.3179	0.3160	0.3096	0.2843
CO (MOLE)	0.0055	0.0049	0.0045	0.0044	0.0048	0.0057	0.0082	0.0149	0.0384	0.1601
N2 (MOLE)	0.6848	0.6864	0.6874	0.6880	0.6882	0.6883	0.6883	0.6879	0.6868	0.6820
H2 (MOLE)	0.0004	0.0004	0.0004	0.0004	0.0005	0.0007	0.0012	0.0028	0.0099	0.0598
O2 (MOLE)	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3 (MOLE)	0.0007	0.0006	0.0005	0.0005	0.0005	0.0006	0.0009	0.0016	0.0039	0.0135
OH (MOLE)	0.0012	0.0007	0.0004	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
H (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CH4 (MOLE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0035
NO (MOLE)	0.0071	0.0041	0.0021	0.0010	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000
C(S) (MOLE)	1.3259	1.3245	1.3236	1.3229	1.3224	1.3216	1.3198	1.3150	1.2978	1.1980
AL(S) (MOLE)	1.1415	1.1415	1.1415	1.1415	1.1415	1.1415	1.1415	1.1415	1.1415	1.1415



K-H-T HUGONIOT







ALEX 32 RDX/TNT/AL/WAX
RHO (G/CC) 1.880
E_0 (KCAL/MOLE) -0.89

DATE 82-11-02

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

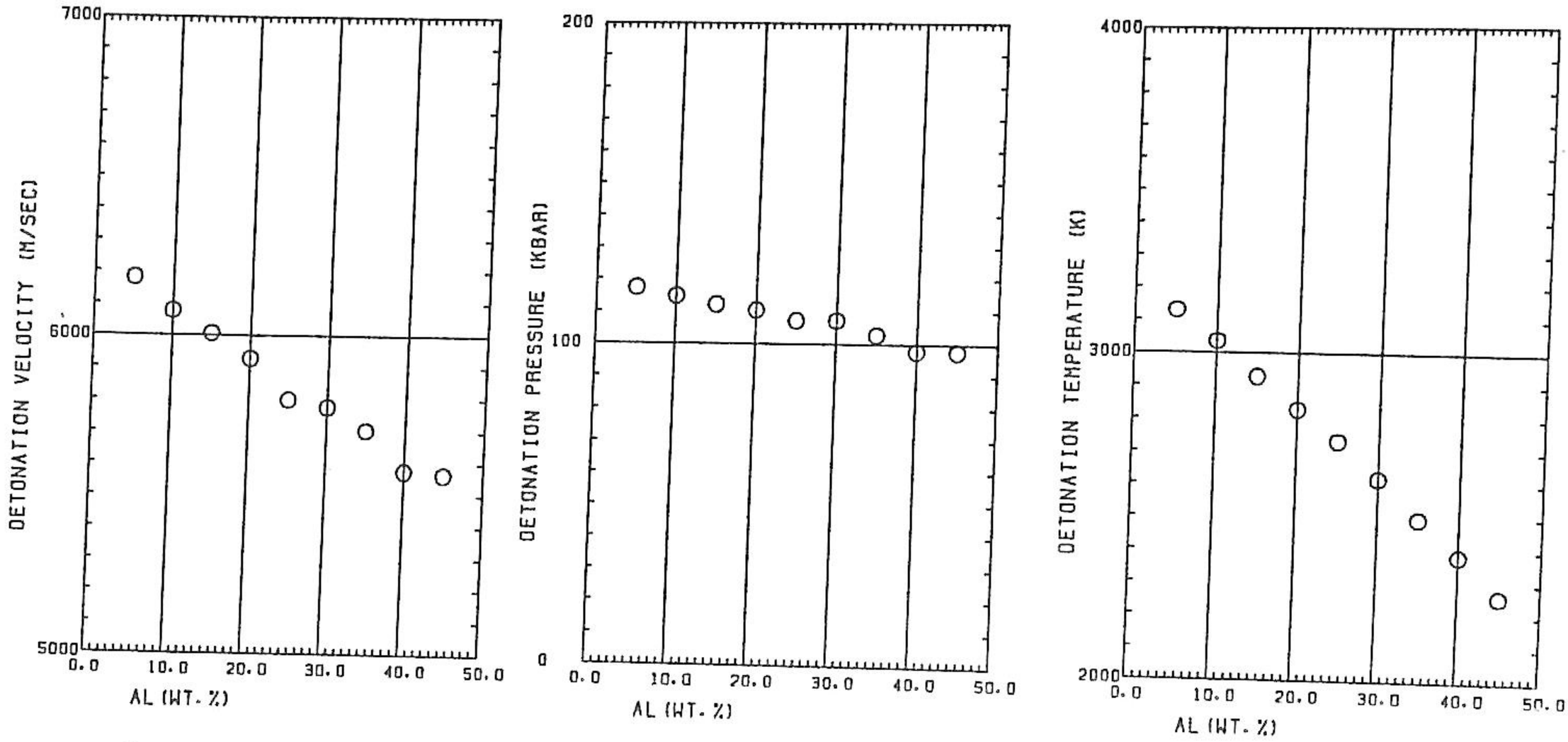
EXPLOSIVES	NM(GEL) 95 AL 5	#NM(GEL) 90 AL 10	#NM(GEL) 85 AL 15	#NM(GEL) 80 AL 20	#NM(GEL) 75 AL 25	#NM(GEL) 70 AL 30	#NM(GEL) 65 AL 35	#
RHO (G/CC)	1.180	1.210	1.251	1.292	1.322	1.382	1.432	
EO (KCAL/MOLE)	-44.28	-44.28	-44.28	-44.28	-44.28	-44.28	-44.28	
MOL.WEIGHT (G)	108.421	114.444	121.176	128.750	137.333	147.143	158.461	
C	1.8504	1.8504	1.8504	1.8504	1.8504	1.8504	1.8504	
H	5.2669	5.2669	5.2669	5.2669	5.2669	5.2669	5.2669	
N	1.6047	1.6047	1.6047	1.6047	1.6047	1.6047	1.6047	
O	3.3119	3.3119	3.3119	3.3119	3.3119	3.3119	3.3119	
AL	0.2009	0.4242	0.6737	0.9544	1.2725	1.6360	2.0555	
DETN.VEL (M/SEC)	6180.2	6076.7	6005.6	5927.8	5799.2	5776.7	5703.7	
PARTICL.VEL(")	1609.2	1560.9	1491.8	1441.7	1398.7	1344.4	1258.6	
C-J PRESS (KBAR)	117.4	114.8	112.1	110.4	107.2	107.3	102.8	
C-J VOLUME (CC/G)	0.62679	0.61416	0.60081	0.58576	0.57399	0.55519	0.54423	
C-J TEMP (DEG K)	3128.0	3035.3	2927.2	2826.4	2731.9	2618.3	2495.6	
C-J S(CAL/DEG MOL)	55.71	56.92	58.19	59.63	61.24	62.96	64.82	
C-J ENERGY (CAL/G)	309.44	291.16	265.96	248.32	233.78	216.00	189.32	
GAMMA	2.840	2.893	3.026	3.112	3.146	3.297	3.532	
C-J DETN.HEAT(CAL)	1237.3	1177.3	1117.5	1057.0	994.2	933.1	869.2	
LAMDA	7.6045	7.6046	7.6046	7.6044	7.6046	7.6039	7.6041	
VOLUM(K LITTRE/KG)	0.8857	0.8358	0.7857	0.7362	0.6881	0.6388	0.5914	
TOTAL PRODCT(MOLE)	5.4542	5.6804	5.9334	6.2176	6.5379	6.9057	7.3274	
V GAS (MOLES)	3.9249	3.9096	3.8918	3.8742	3.8625	3.8420	3.8304	
V GAS (CC/MOLE)	15.3835	15.4295	15.4667	15.4549	15.5331	15.4036	15.5255	
V C(S) (CC/G)	0.34474	0.34576	0.34675	0.34716	0.34855	0.34780	0.34986	
V AL(S) (CC/G)	0.38329	0.38199	0.38038	0.37862	0.37746	0.37488	0.37349	
H2O (MOL %)	45.4885	43.9340	42.3482	40.6866	38.8584	37.0857	35.0969	
CO2 (MOL %)	5.6814	5.5200	5.3550	5.1731	4.9666	4.7592	4.5281	
CO (MOL %)	3.8525	3.3186	2.7520	2.2301	1.8634	1.3541	1.0460	
N2 (MOL %)	14.4380	13.8861	13.3196	12.7349	12.1262	11.5066	10.8583	
H2 (MOL %)	1.8999	1.6469	1.3772	1.1229	0.9534	0.6947	0.5543	
O2 (MOL %)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
NH3 (MOL %)	0.5405	0.4742	0.4040	0.3380	0.2913	0.2235	0.1830	
OH (MOL %)	0.0146	0.0105	0.0069	0.0046	0.0030	0.0018	0.0009	
H (MOL %)	0.0042	0.0030	0.0019	0.0012	0.0008	0.0004	0.0002	
CH4 (MOL %)	0.0370	0.0306	0.0239	0.0178	0.0146	0.0089	0.0068	
NO (MOL %)	0.0045	0.0032	0.0021	0.0014	0.0009	0.0005	0.0003	
C(S) (MOL %)	24.3552	23.7061	23.0555	22.3401	21.4583	20.6733	19.6725	
AL(S) (MOL %)	3.6837	7.4670	11.3538	15.3494	19.4631	23.6912	28.0528	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES	NM(GEL) 60 AL 40	#NM(GEL) 55 AL 45	#
RHO (G/CC)	1.472	1.543	
EO (KCAL/MOLE)	-44.28	-44.28	
MOL.WEIGHT (G)	171.667	187.273	
C	1.8504	1.8504	
H	5.2669	5.2669	
N	1.6047	1.6047	
O	3.3119	3.3119	
AL	2.5450	3.1234	
DETN.VEL (M/SEC)	5576.0	5565.8	
PARTICL.VEL(")	1191.1	1136.6	
C-J PRESS (KBAR)	97.8	97.6	
C-J VOLUME (CC/G)	0.53423	0.51575	
C-J TEMP (DEG K)	2382.7	2260.1	
C-J S(CAL/DEG MOL)	67.02	69.46	
C-J ENERGY (CAL/G)	169.57	154.37	
GAMMA	3.681	3.897	
C-J DETN.HEAT(CAL)	804.3	740.1	
LAMDA	7.6043	7.6033	
VOLUM(K LITTRE/KG)	0.5447	0.4974	
TOTAL PRODCT(MOLE)	7.8184	8.4000	
V GAS (MOLES)	3.8218	3.8074	
V GAS (CC/MOLE)	15.6968	15.5540	
V C(S) (CC/G)	0.35233	0.35167	
V AL(S) (CC/G)	0.37248	0.36975	
H2O (MOL %)	32.9905	30.8858	
CO2 (MOL %)	4.2758	4.0078	
CO (MOL %)	0.8190	0.5269	
N2 (MOL %)	10.1860	9.4978	
H2 (MOL %)	0.4522	0.2970	
O2 (MOL %)	0.0000	0.0000	
NH3 (MOL %)	0.1525	0.1079	
OH (MOL %)	0.0005	0.0002	
H (MOL %)	0.0001	0.0000	
CH4 (MOL %)	0.0055	0.0029	
NO (MOL %)	0.0001	0.0001	
C(S) (MOL %)	18.5672	17.4911	
AL(S) (MOL %)	32.5508	37.1826	

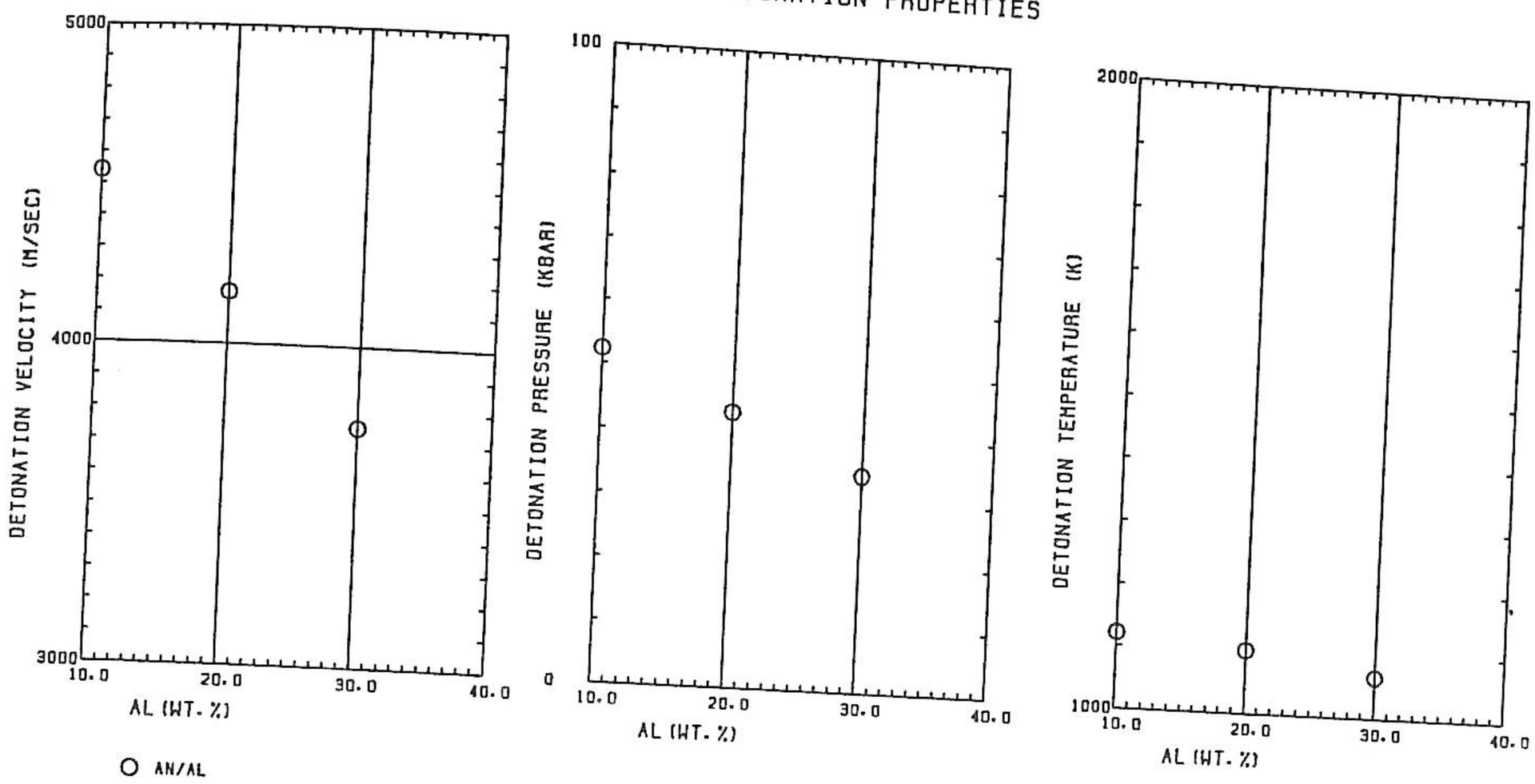
RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-11-02>> **********

EXPLOSIVES	AN 90 AL 10	#AN 80 AL 20	#AN 70 AL 30	#
RHO (G/CC)	1.050	1.050	1.050	
EO (KCAL/MOLE)	-98.14	-87.23	-76.33	
MOL.WEIGHT (G)	100.000	100.000	100.000	
N	2.2488	1.9989	1.7490	
H	4.4976	3.9978	3.4981	
O	3.3732	2.9984	2.6236	
AL	0.3706	0.7412	1.1119	
DETN.VEL (M/SEC)	4540.0	4163.0	3748.2	
PARTICL.VEL(")	1097.1	988.9	871.4	
C-J PRESS (KBAR)	52.3	43.2	34.3	
C-J VOLUME (CC/G)	0.72225	0.72614	0.73098	
C-J TEMP (DEG K)	1120.7	1100.9	1065.4	
C-J S(CAL/DEG MOL)	41.68	43.63	45.95	
C-J ENERGY (CAL/G)	143.83	116.87	90.74	
GAMMA	3.138	3.210	3.301	
C-J DETN.HEAT(CAL)	318.3	282.9	247.6	
LAMDA	7.5999	7.5999	7.5999	
VOLUM(K LITTRE/KG)	0.9628	0.8558	0.7488	
TOTAL PRODCT(MOLE)	4.3060	4.2394	4.1728	
V GAS (MOLES)	3.9354	3.4981	3.0609	
V GAS (CC/MOLE)	17.4421	18.6935	20.3174	
V AL(S) (CC/G)	0.35829	0.36110	0.36363	
H2O (MOL %)	52.2252	47.1523	41.9173	
N2 (MOL %)	26.1084	23.5729	20.9565	
H2 (MOL %)	0.0000	0.0000	0.0000	
O2 (MOL %)	13.0515	11.7843	10.4766	
NH3 (MOL %)	0.0000	0.0000	0.0000	
OH (MOL %)	0.0000	0.0000	0.0000	
H (MOL %)	0.0000	0.0000	0.0000	
NO (MOL %)	0.0077	0.0056	0.0034	
AL(S) (MOL %)	8.6071	17.4848	26.6460	

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C



********** K-H-T C - J D E T O N A T I O N P R O P E R T I E S <<DATE 82-12-01>> **********

EXPLOSIVES		PBXC-9,HMX75# AL20/VITON 5
RHO	(G/CC)	1.975
EO	(KCAL/MOLE)	-4.36
MOL.WEIGHT	(G)	100.000
C		1.1466
H		2.1195
N		2.0260
O		2.0260
AL		0.7412
F		0.1737
DETN.VEL	(M/SEC)	8551.6
PARTICL.VEL	(")	1904.0
C-J PRESS	(KBAR)	321.6
C-J VOLUME	(CC/G)	0.39359
C-J TEMP	(DEG K)	2863.9
C-J S	(CAL/DEG MOL)	58.19
C-J ENERGY	(CAL/G)	433.24
GAMMA		3.491
C-J DETN.HEAT	(CAL)	1125.4
LAMDA		8.8918
VOLUM	(K LITTRE/KG)	0.6578
TOTAL PRODCT	(MOLE)	4.0477
V GAS	(MOLES)	2.6888
V GAS	(CC/MOLE)	11.4727
V C(S)	.(CC/G)	0.24596
V AL(S)	(CC/G)	0.33435
H2O	(MOL %)	24.0150
CO2	(MOL %)	12.9457
CO	(MOL %)	0.1243
N2	(MOL %)	25.0135
CF4	(MOL %)	0.0000
H2	(MOL %)	0.0065
O2	(MOL %)	0.0004
NH3	(MOL %)	0.0075
OH	(MOL %)	0.0032
H	(MOL %)	0.0000
CH4	(MOL %)	0.0000
NO	(MOL %)	0.0177
HF	(MOL %)	4.2948
F2	(MOL %)	0.0000
C(S)	(MOL %)	15.2584
AL(S)	(MOL %)	18.3130

RHO; THE INITIAL DENSITY, EO; THE HEAT OF FORMATION AT 298.15 K
C-J S; THE C-J ENTROPY , C-J ENERGY; THE C-J ENERGY,E(C-J) - EO
DETN.HEAT; THE ESTIMATED HEAT OF DETONATION, VOLUM; THE AMMOUNT OF GASES CORRESPONDING TO 1ATM,25 DEG C

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B–C–H–N–O	87	
B–C–H–N–O–F	91	
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C–H	50	
C–H–N–F	94	
C–H–N–O	97	(Single compounds)
C–H–N–O	182	(Liquids. Also,see single compounds.)
C–H–N–O	147	(Solid mixtures)
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