

PROPELLANT	HF	DENSITY	WEIGHT	MOLES	VOLUME
AP	-60.2100	1.9500	.7000	.0060	.3590
HTPB	1.2000	.9220	.1400	.0014	.1518
AL	.0000	2.7000	.1600	.0059	.0593

GRAM ATOMS/100 GRAMS

H	3.8303	O	2.3981	N	.5958	CL	.5958	C	1.0243	AL	.5930
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ENTHALPY = -35.70505      DENSITY = 1.754  
 CSTAR = 5261.63

	CHAMBER	THR (SHIFT)	EXH (SHIFT)
PRESSURE (PSIA)	1000.000	574.844	14.700
EPSILON	.000	1.000	10.199
ISP	.000	107.804	267.008
ISP (VACUUM)	.000	201.814	291.528
TEMPERATURE (K)	3442.372	3237.986	2138.563
MOLECULAR WEIGHT	27.417	27.623	28.241
MOLES GAS/100G	3.647	3.620	3.541
CF	.000	.659	1.633
PEAE/M (SECONDS)	.000	94.010	24.520
GAMMA	1.180	1.179	1.202
HEAT CAP (CAL)	47.440	47.345	41.946
ENTROPY (CAL)	230.770	230.771	230.771
ENTHALPY (KCAL)	-35.705	-49.056	-117.606
DENSITY (G/CC)	6.60451E-03	4.06655E-03	1.60977E-04
ITERATIONS	13	4	11

GRAMS/100 GRAMS

H	.12636	.10053	.00807
H2	2.25240	2.28220	2.39386
HO	.37394	.25414	.00584
HO2	.00011	.00004	.00000
H2O	7.72633	7.59201	7.09999
H2O2	.00003	.00001	.00000
O	.02280	.01238	.00003
O2	.00747	.00397	.00001
HN	.00019	.00008	.00000
HNO	.00011	.00005	.00000
H2N	.00044	.00022	.00000
H3N	.00115	.00076	.00006
N	.00029	.00013	.00000
NO	.04770	.02855	.00023
N2	8.31569	8.32617	8.34118
N2O	.00001	.00000	.00000
CL2	.00560	.00391	.00012
CL	1.33902	1.10546	.10198
CLH	18.54195	19.30169	21.33618
CLHO	.00115	.00064	.00000
CLNO	.00001	.00001	.00000
CLO	.00101	.00049	.00000
HCOOH	.00016	.00009	.00000
CCLN	.00001	.00001	.00000

CCLO	.00308	.00175	.00002
CHN	.00127	.00075	.00002
CHNO	.00014	.00008	.00000
CHO	.00334	.00182	.00002
CH2O	.00033	.00019	.00001
CH3	.00001	.00000	.00000
CN	.00002	.00001	.00000
CNO	.00001	.00000	.00000
CO	26.32154	26.31410	25.86335
CO2	2.11683	2.13327	2.85583
AL2O	.01163	.00399	.00000
AL2O2	.00137	.00045	.00000
AL	.01145	.00489	.00000
ALCL	1.25924	.80319	.00245
ALCLO	.42415	.27983	.00142
ALCL2	.64737	.43332	.00282
ALCL3	.11093	.08908	.00425
ALH	.00245	.00094	.00000
ALHO	.00008	.00003	.00000
ALHO	.06743	.03818	.00006
ALHO2	.11078	.06325	.00013
ALO	.02816	.01167	.00000
ALO2	.00032	.00010	.00000
AL2O3 (ALPHA)	.00000	.00000	29.64392
AL2O3/LIQ	27.70415	28.41681	.00000

PROPELLANT	HF	DENSITY	WEIGHT	MOLES	VOLUME
AP	-60.2100	1.9500	.7000	.0060	.3590
HTPB	1.2000	.9220	.1400	.0014	.1518
AL	.0000	2.7000	.1600	.0059	.0593

GRAM ATOMS/100 GRAMS

H	3.8303	O	2.3981	N	.5958	CL	.5958	C	1.0243	AL	.5930
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ENTHALPY = -35.70505      DENSITY =1.754

CSTAR = 5273.47

	CHAMBER	THR(SHIFT)	EXH(SHIFT)
PRESSURE (PSIA)	1500.000	863.064	14.700
EPSILON	.000	1.000	13.780
ISP	.000	107.969	276.734
ISP (VACUUM)	.000	202.278	298.869
TEMPERATURE(K)	3474.238	3262.934	2002.722
MOLECULAR WEIGHT	27.516	27.705	28.268
MOLES GAS/100G	3.634	3.609	3.538
CF	.000	.659	1.688
PEAE/M (SECONDS)	.000	94.309	22.134
GAMMA	1.179	1.178	1.204
HEAT CAP (CAL)	47.487	47.380	41.551
ENTROPY (CAL)	227.837	227.838	227.837
ENTHALPY (KCAL)	-35.705	-49.097	-123.681
DENSITY (G/CC)	9.85143E-03	6.07683E-03	1.72056E-04
ITERATIONS	6	3	10

GRAMS/100 GRAMS

H	.11112	.08761	.00340
H2	2.26210	2.29025	2.40713
HO	.33475	.22500	.00191
HO2	.00011	.00004	.00000
H2O	7.75512	7.61363	7.01343
H2O2	.00003	.00001	.00000
O	.01782	.00950	.00000
O2	.00583	.00304	.00000
HN	.00021	.00009	.00000
HNO	.00012	.00005	.00000
H2N	.00057	.00029	.00000
H3N	.00172	.00113	.00007
N	.00028	.00012	.00000
NO	.04337	.02563	.00006
N2	8.31689	8.32703	8.34116
N2O	.00001	.00000	.00000
CL2	.00581	.00418	.00006
CL	1.18152	.96630	.04358
CLH	18.71054	19.45257	21.40177
CLHO	.00126	.00070	.00000
CLNO	.00002	.00001	.00000
CLO	.00096	.00046	.00000
HCOOH	.00024	.00013	.00000
CCLN	.00002	.00001	.00000

CCLO	.00391	.00225	.00001
CHN	.00186	.00114	.00002
CHNO	.00021	.00012	.00000
CHO	.00432	.00234	.00001
CH2O	.00050	.00029	.00001
CH3	.00001	.00001	.00000
CH4	.00001	.00000	.00000
CN	.00003	.00001	.00000
CNO	.00001	.00001	.00000
CO	26.32701	26.32012	25.72336
CO2	2.10471	2.12136	3.07905
AL2O	.00983	.00330	.00000
AL2O2	.00116	.00037	.00000
AL	.00937	.00392	.00000
ALCL	1.16007	.73178	.00041
ALCLO	.38695	.25264	.00027
ALCL2	.70667	.46965	.00079
ALCL3	.14075	.11288	.00252
ALH	.00231	.00091	.00000
ALHO	.00008	.00003	.00000
ALHO	.06235	.03489	.00001
ALHO2	.10180	.05746	.00002
ALO	.02303	.00935	.00000
ALO2	.00027	.00008	.00000
AL2O3 (ALPHA)	.00000	.00000	29.64899
AL2O3/LIQ	27.79490	28.48000	.00000

PROPELLANT	HF	DENSITY	WEIGHT	MOLES	VOLUME
AP	-60.2100	1.9500	.7000	.0060	.3590
HTPB	1.2000	.9220	.1400	.0014	.1518
AL	.0000	2.7000	.1600	.0059	.0593

GRAM ATOMS/100 GRAMS

H	3.8303	O	2.3981	N	.5958	CL	.5958	C	1.0243	AL	.5930
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ENTHALPY = -35.70505      DENSITY =1.754

CSTAR = 5278.63

	CHAMBER	THR(SHIFT)	EXH(SHIFT)
PRESSURE (PSIA)	2000.000	1150.277	14.700
EPSILON	.000	1.000	17.096
ISP	.000	108.221	283.044
ISP (VACUUM)	.000	202.584	303.659
TEMPERATURE(K)	3495.530	3278.928	1908.457
MOLECULAR WEIGHT	27.583	27.760	28.277
MOLES GAS/100G	3.625	3.602	3.536
CF	.000	.660	1.725
PEAE/M (SECONDS)	.000	94.362	20.616
GAMMA	1.179	1.178	1.205
HEAT CAP (CAL)	47.518	47.404	41.257
ENTROPY (CAL)	225.762	225.761	225.762
ENTHALPY (KCAL)	-35.705	-49.159	-127.738
DENSITY (G/CC)	1.30872E-02	8.07563E-03	1.80614E-04
ITERATIONS	7	4	10

GRAMS/100 GRAMS

H	.10106	.07912	.00174
H2	2.26863	2.29568	2.41692
HO	.30797	.20518	.00080
HO2	.00010	.00004	.00000
H2O	7.77370	7.62718	6.93962
H2O2	.00004	.00002	.00000
O	.01485	.00779	.00000
O2	.00485	.00249	.00000
HN	.00023	.00010	.00000
HNO	.00013	.00006	.00000
H2N	.00069	.00035	.00000
H3N	.00229	.00151	.00009
N	.00027	.00012	.00000
NO	.04031	.02357	.00002
N2	8.31743	8.32746	8.34117
N2O	.00001	.00001	.00000
CL2	.00635	.00437	.00003
CL	1.07669	.87423	.02250
CLH	18.82064	19.55157	21.42423
CLHO	.00134	.00073	.00000
CLNO	.00002	.00001	.00000
CLO	.00091	.00043	.00000
HCOOH	.00032	.00018	.00000
CCLN	.00003	.00001	.00000

CCLO	.00478	.00268	.00001
CHN	.00256	.00152	.00002
CHNO	.00028	.00016	.00000
CHO	.00517	.00279	.00001
CH2O	.00067	.00039	.00001
CH3	.00002	.00001	.00000
CH4	.00001	.00001	.00000
CN	.00004	.00002	.00000
CNO	.00002	.00001	.00000
CO	26.33005	26.32389	25.60433
CO2	2.09656	2.11360	3.26856
AL2O	.00862	.00284	.00000
AL2O2	.00102	.00032	.00000
AL	.00804	.00331	.00000
ALCL	1.08744	.67967	.00010
ALCLO	.36036	.23327	.00007
ALCL2	.74837	.49433	.00029
ALCL3	.16628	.13317	.00167
ALH	.00235	.00088	.00000
ALHO	.00008	.00003	.00000
ALHO	.05859	.03246	.00000
ALHO2	.09527	.05325	.00001
ALO	.01976	.00788	.00000
ALO2	.00023	.00007	.00000
AL2O3 (ALPHA)	.00000	.00000	29.64931
AL2O3/LIQ	27.85907	28.52514	.00000