$G^\circ = H^\circ - T S^\circ$ $H = U + PV$ $A = U - TS$

C

CARBON (C)

(REFERENCE STATE - GRAPHITE) GFW=12.011

$S_T^\circ = \int_0^T \frac{C_p}{T} dT$ $\Delta G = \Delta F$

	gibbs/mol			kcal/mol			
T, K	Cp°	S°	-(G°-H°298)/T	H°-H°298	ΔHf°	ΔGf°	Log Kp
0	0.000	0.000	INFINITE	-0.251	0.000	0.000	0.000
100	.400	0.228	2.597	-0.237	0.000	0.000	0.000
200	1.196	0.737	1.531	-0.159	0.000	0.000	0.000
298	2.036	1.372	1.372	0.000	0.000	0.000	0.000
300	2.051	1.385	1.372	0.004	0.000	0.000	0.000
400	2.824	2.083	1.462	0.248	0.000	0.000	0.000
500	3.495	2.787	1.657	0.565	0.000	0.000	0.000
600	4.026	3.474	1.903	0.942	0.000	0.000	0.000
700	4.430	4.126	2.174	1.366	0.000	0.000	0.000
800	4.739	4.739	2.457	1.825	0.000	0.000	0.000
900	4.977	5.311	2.743	2.312	0.000	0.000	0.000
1000	5.165	5.845	3.026	2.819	0.000	0.000	0.000
1100	5.316	6.345	3.306	3.343	0.000	0.000	0.000
1200	5.441	6.813	3.579	3.881	0.000	0.000	0.000
1300	5.546	7.253	3.845	4.431	0.000	0.000	0.000
1400	5.635	7.667	4.103	4.990	0.000	0.000	0.000
1500	5.713	8.059	4.354	5.558	0.000	0.000	0.000
1600	5.782	8.430	4.597	6.132	0.000	0.000	0.000
1700	5.843	8.782	4.833	6.714	0.000	0.000	0.000
1800	5.899	9.118	5.062	7.301	0.000	0.000	0.000
1900	5.950	9.438	5.284	7.893	0.000	0.000	0.000
2000	5.997	9.745	5.499	8.491	0.000	0.000	0.000
2100	6.042	10.038	5.708	9.093	0.000	0.000	0.000
2200	6.083	10.320	5.912	9.699	0.000	0.000	0.000
2300	6.123	10.592	6.109	10.309	0.000	0.000	0.000
2400	6.160	10.853	6.301	10.924	0.000	0.000	0.000
2500	6.196	11.105	6.489	11.541	0.000	0.000	0.000
2600	6.231	11.349	6.671	12.163	0.000	0.000	0.000
2700	6.265	11.585	6.848	12.788	0.000	0.000	0.000
2800	6.297	11.813	7.022	13.416	0.000	0.000	0.000
2900	6.329	12.035	7.191	14.047	0.000	0.000	0.000
3000	6.360	12.250	7.356	14.682	0.000	0.000	0.000
3100	6.391	12.459	7.517	15.319	0.000	0.000	0.000
3200	6.420	12.662	7.675	15.960	0.000	0.000	0.000
3300	6.450	12.860	7.829	16.603	0.000	0.000	0.000
3400	6.478	13.053	7.980	17.250	0.000	0.000	0.000
3500	6.507	13.241	8.127	17.899	0.000	0.000	0.000
3600	6.535	13.425	8.272	18.551	0.000	0.000	0.000
3700	6.563	13.604	8.414	19.206	0.000	0.000	0.000
3800	6.590	13.780	8.553	19.863	0.000	0.000	0.000
3900	6.617	13.951	8.689	20.524	0.000	0.000	0.000
4000	6.644	14.119	8.822	21.187	0.000	0.000	0.000
4100	6.671	14.284	8.954	21.853	0.000	0.000	0.000
4200	6.698	14.445	9.083	22.521	0.000	0.000	0.000
4300	6.724	14.603	9.209	23.192	0.000	0.000	0.000
4400	6.751	14.758	9.333	23.866	0.000	0.000	0.000
4500	6.777	14.910	9.454	24.542	0.000	0.000	0.000
4600	6.803	15.059	9.576	25.221	0.000	0.000	0.000
4700	6.828	15.205	9.694	25.903	0.000	0.000	0.000
4800	6.854	15.349	9.810	26.587	0.000	0.000	0.000
4900	6.880	15.491	9.925	27.274	0.000	0.000	0.000
5000	6.905	15.630	10.038	27.963	0.000	0.000	0.000
5100	6.931	15.767	10.149	28.655	0.000	0.000	0.000
5200	6.956	15.902	10.258	29.349	0.000	0.000	0.000
5300	6.982	16.035	10.366	30.046	0.000	0.000	0.000
5400	7.007	16.166	10.472	30.746	0.000	0.000	0.000
5500	7.032	16.294	10.577	31.448	0.000	0.000	0.000
5600	7.057	16.421	10.680	32.152	0.000	0.000	0.000
5700	7.082	16.546	10.782	32.859	0.000	0.000	0.000
5800	7.107	16.670	10.882	33.568	0.000	0.000	0.000
5900	7.132	16.792	10.981	34.280	0.000	0.000	0.000
6000	7.157	16.912	11.079	34.995	0.000	0.000	0.000

Mar. 31, 1961; Mar. 31, 1978

Methane (CH_4)

(Ideal Gas) Mol. Wt. = 16.043

T, °K.	C_p°	S°	$-(F^\circ-H^\circ_{298})/T$	$H^\circ-H^\circ_{298}$	ΔH_f°	ΔF_f° (= ΔG)	Log K_f
	cal. mole^{-1}deg.$^{-1}$			kcal. mole^{-1}			
0	.000	.000	INFINITE	- 2.396	- 15.991	- 15.991	INFINITE
100	7.949	35.706	51.716	- 1.601	- 16.728	- 13.400	33.696
200	8.001	41.222	45.247	- .805	- 17.216	- 13.909	15.198
298	8.518	44.490	44.490	.000	- 17.895	- 12.145	8.902
300	8.535	44.543	44.490	.016	- 17.909	- 12.110	8.822
400	9.680	47.144	44.837	.923	- 18.636	- 10.066	5.500
500	11.076	49.453	45.533	1.960	- 19.316	- 7.845	3.429
600	12.483	51.597	46.367	3.138	- 19.916	- 5.493	2.001
700	13.813	53.622	47.260	4.454	- 20.429	- 3.046	.951
800	15.041	55.548	48.176	5.897	- 20.857	- .533	.146
900	16.157	57.385	49.098	7.458	- 21.207	2.029	- .493
1000	17.160	59.141	50.016	9.125	- 21.482	4.625	- 1.011
1100	18.052	60.819	50.922	10.887	- 21.696	7.247	- 1.440
1200	18.842	62.424	51.814	12.732	- 21.854	9.887	- 1.801
1300	19.538	63.960	52.690	14.652	- 21.971	12.535	- 2.107
1400	20.150	65.431	53.548	16.637	- 22.050	15.195	- 2.372
1500	20.688	66.840	54.387	18.679	- 22.104	17.859	- 2.602
1600	21.161	68.191	55.208	20.772	- 22.137	20.520	- 2.803
1700	21.579	69.486	56.010	22.910	- 22.148	23.189	- 2.981
1800	21.947	70.730	56.794	25.086	- 22.144	25.854	- 3.139
1900	22.273	71.926	57.559	27.298	- 22.127	28.522	- 3.281
2000	22.562	73.076	58.306	29.540	- 22.099	31.187	- 3.408
2100	22.820	74.183	59.036	31.809	- 22.065	33.851	- 3.523
2200	23.050	75.250	59.749	34.103	- 22.026	36.511	- 3.627
2300	23.256	76.279	60.445	36.418	- 21.981	39.173	- 3.722
2400	23.441	77.273	61.126	38.753	- 21.935	41.833	- 3.809
2500	23.608	78.233	61.791	41.106	- 21.888	44.483	- 3.889
2600	23.758	79.162	62.441	43.474	- 21.839	47.141	- 3.962
2700	23.894	80.062	63.077	45.857	- 21.790	49.791	- 4.030
2800	24.018	80.933	63.700	48.253	- 21.741	52.440	- 4.093
2900	24.131	81.778	64.309	50.660	- 21.694	55.093	- 4.152
3000	24.233	82.597	64.905	53.079	- 21.649	57.736	- 4.206
3100	24.327	83.394	65.488	55.507	- 21.602	60.381	- 4.257
3200	24.413	84.167	66.060	57.944	- 21.561	63.026	- 4.304
3300	24.493	84.920	66.620	60.389	- 21.524	65.669	- 4.349
3400	24.565	85.652	67.169	62.842	- 21.488	68.309	- 4.391
3500	24.633	86.365	67.707	65.302	- 21.459	70.951	- 4.430
3600	24.695	87.060	68.235	67.768	- 21.433	73.589	- 4.467
3700	24.752	87.737	68.753	70.241	- 21.414	76.231	- 4.503
3800	24.806	88.398	69.262	72.719	- 21.397	78.872	- 4.536
3900	24.855	89.043	69.761	75.202	- 21.389	81.511	- 4.568
4000	24.901	89.673	70.251	77.690	- 21.386	84.150	- 4.598
4100	24.944	90.288	70.732	80.182	- 21.387	86.785	- 4.626
4200	24.984	90.890	71.205	82.678	- 21.397	89.429	- 4.653
4300	25.022	91.478	71.669	85.179	- 21.412	92.063	- 4.679
4400	25.057	92.054	72.126	87.683	- 21.434	94.700	- 4.704
4500	25.090	92.617	72.575	90.190	- 21.463	97.335	- 4.727
4600	25.121	93.169	73.017	92.701	- 21.498	99.983	- 4.750
4700	25.150	93.710	73.452	95.214	- 21.540	102.625	- 4.772
4800	25.177	94.240	73.879	97.730	- 21.589	105.268	- 4.793
4900	25.203	94.759	74.300	100.249	- 21.644	107.912	- 4.813
5000	25.227	95.268	74.714	102.771	- 21.706	110.552	- 4.832
5100	25.250	95.768	75.122	105.295	- 21.777	113.198	- 4.851
5200	25.272	96.259	75.524	107.821	- 21.853	115.844	- 4.869
5300	25.292	96.740	75.920	110.349	- 21.937	118.501	- 4.886
5400	25.311	97.213	76.310	112.879	- 22.029	121.145	- 4.903
5500	25.330	97.678	76.694	115.411	- 22.128	123.799	- 4.919
5600	25.347	98.134	77.073	117.945	- 22.234	126.449	- 4.935
5700	25.364	98.583	77.446	120.481	- 22.348	129.106	- 4.950
5800	25.379	99.024	77.814	123.018	- 22.469	131.762	- 4.965
5900	25.394	99.458	78.178	125.557	- 22.598	134.428	- 4.979
6000	25.409	99.885	78.536	128.097	- 22.732	137.081	- 4.993

March 31, 1961

JANAF THERMOCHEMICAL DATA

Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL LABORATORY, Midland, Michigan

Carbon Monoxide (CO)

(Ideal Gas) Mol. Wt. = 28.011

T, °K.	C_p° (cal. mole^{-1}deg.$^{-1}$)	S° (cal. mole^{-1}deg.$^{-1}$)	$-(F^\circ-H^\circ_{298})/T$ (cal. mole^{-1}deg.$^{-1}$)	$H^\circ-H^\circ_{298}$ (kcal. mole^{-1})	ΔH_f° (kcal. mole^{-1})	ΔF_f° (kcal. mole^{-1})	Log K_p
0	.000	.000	INFINITE	- 2.073	- 27.200	- 27.200	INFINITE
100	7.152	39.517	53.443	- 1.393	- 26.890	- 28.745	62.818
200	7.011	44.426	47.852	- .685	- 26.601	- 30.719	33.566
298	6.965	47.214	47.214	.000	- 26.417	- 32.783	24.029
300	6.965	47.257	47.214	.013	- 26.414	- 32.823	23.910
400	7.013	49.265	47.488	.711	- 26.318	- 34.975	19.109
500	7.121	50.841	48.006	1.417	- 26.296	- 37.144	16.235
600	7.276	52.152	48.591	2.137	- 26.332	- 39.311	14.318
700	7.450	53.287	49.182	2.873	- 26.409	- 41.468	12.946
800	7.624	54.293	49.759	3.627	- 26.514	- 43.612	11.914
900	7.786	55.200	50.314	4.397	- 26.637	- 45.744	11.108
1000	7.931	56.028	50.845	5.183	- 26.771	- 47.859	10.459
1100	8.057	56.790	51.351	5.983	- 26.914	- 49.962	9.926
1200	8.168	57.496	51.834	6.794	- 27.062	- 52.049	9.479
1300	8.263	58.154	52.295	7.616	- 27.218	- 54.126	9.099
1400	8.346	58.769	52.736	8.446	- 27.376	- 56.189	8.771
1500	8.417	59.348	53.158	9.285	- 27.537	- 58.241	8.485
1600	8.480	59.893	53.562	10.130	- 27.700	- 60.284	8.234
1700	8.535	60.409	53.950	10.980	- 27.865	- 62.315	8.011
1800	8.583	60.898	54.322	11.836	- 28.032	- 64.337	7.811
1900	8.626	61.363	54.681	12.697	- 28.201	- 66.349	7.631
2000	8.664	61.807	55.026	13.561	- 28.372	- 68.353	7.469
2100	8.698	62.230	55.359	14.430	- 28.543	- 70.346	7.321
2200	8.728	62.635	55.680	15.301	- 28.719	- 72.335	7.185
2300	8.756	63.024	55.991	16.175	- 28.894	- 74.311	7.061
2400	8.781	63.397	56.292	17.052	- 29.074	- 76.282	6.946
2500	8.804	63.756	56.584	17.931	- 29.254	- 78.247	6.840
2600	8.825	64.102	56.866	18.813	- 29.438	- 80.202	6.741
2700	8.844	64.435	57.140	19.696	- 29.623	- 82.153	6.649
2800	8.863	64.757	57.407	20.582	- 29.810	- 84.093	6.563
2900	8.879	65.069	57.666	21.469	- 30.001	- 86.028	6.483
3000	8.895	65.370	57.917	22.357	- 30.194	- 87.957	6.407
3100	8.910	65.662	58.163	23.248	- 30.388	- 89.878	6.336
3200	8.924	65.945	58.401	24.139	- 30.586	- 91.795	6.269
3300	8.937	66.220	58.634	25.032	- 30.786	- 93.707	6.206
3400	8.949	66.487	58.861	25.927	- 30.988	- 95.609	6.145
3500	8.961	66.746	59.083	26.822	- 31.192	- 97.509	6.088
3600	8.973	66.999	59.299	27.719	- 31.399	- 99.400	6.034
3700	8.984	67.245	59.511	28.617	- 31.608	-101.286	5.982
3800	8.994	67.485	59.717	29.516	- 31.818	-103.164	5.933
3900	9.004	67.718	59.919	30.416	- 32.031	-105.039	5.886
4000	9.014	67.946	60.117	31.316	- 32.247	-106.908	5.841
4100	9.024	68.169	60.311	32.218	- 32.464	-108.774	5.798
4200	9.033	68.387	60.501	33.121	- 32.684	-110.630	5.756
4300	9.042	68.599	60.687	34.025	- 32.906	-112.483	5.717
4400	9.051	68.807	60.869	34.930	- 33.130	-114.333	5.679
4500	9.059	69.011	61.047	35.835	- 33.356	-116.177	5.642
4600	9.068	69.210	61.223	36.741	- 33.584	-118.012	5.607
4700	9.076	69.405	61.395	37.649	- 33.814	-119.845	5.573
4800	9.084	69.596	61.564	38.557	- 34.046	-121.672	5.540
4900	9.092	69.784	61.729	39.465	- 34.280	-123.497	5.508
5000	9.100	69.967	61.892	40.375	- 34.516	-125.315	5.477
5100	9.107	70.148	62.052	41.285	- 34.755	-127.132	5.448
5200	9.115	70.325	62.210	42.196	- 34.995	-128.941	5.419
5300	9.123	70.498	62.365	43.108	- 35.237	-130.741	5.391
5400	9.130	70.669	62.517	44.021	- 35.480	-132.542	5.364
5500	9.138	70.836	62.667	44.934	- 35.727	-134.336	5.338
5600	9.145	71.001	62.814	45.849	- 35.974	-136.129	5.312
5700	9.153	71.163	62.959	46.763	- 36.225	-137.919	5.288
5800	9.160	71.322	63.102	47.679	- 36.476	-139.698	5.264
5900	9.167	71.479	63.242	48.595	- 36.730	-141.473	5.240
6000	9.175	71.633	63.381	49.513	- 36.985	-143.249	5.218

March 31, 1961

JANAF THERMOCHEMICAL DATA

Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL LABORATORY, Midland, Michigan.

Carbon Dioxide (CO_2)

(Ideal Gas) Mol. Wt. = 44.011

T, °K.	C_p° (cal. mole^{-1}deg.$^{-1}$)	S° (cal. mole^{-1}deg.$^{-1}$)	$-(F^\circ-H^\circ_{298})/T$ (cal. mole^{-1}deg.$^{-1}$)	$H^\circ-H^\circ_{298}$ (kcal. mole^{-1})	ΔH_f° (kcal. mole^{-1})	ΔF_f° (kcal. mole^{-1})	Log K_f
0	.000	.000	INFINITE	- 2.238	- 93.965	- 93.965	INFINITE
100	5.708	43.276	57.987	- 1.471	- 93.825	- 94.080	205.601
200	7.506	47.807	51.842	- .807	- 94.019	- 94.190	102.921
298	8.874	51.072	51.072	.000	- 94.054	- 94.265	69.095
300	8.896	51.127	51.072	.016	- 94.055	- 94.267	68.670
400	9.877	53.830	51.434	.958	- 94.070	- 94.335	51.540
500	10.666	56.122	52.148	1.987	- 94.091	- 94.399	41.260
600	11.310	58.126	52.981	3.087	- 94.124	- 94.458	34.405
700	11.846	59.910	53.845	4.245	- 94.169	- 94.510	29.506
800	12.293	61.522	54.706	5.453	- 94.218	- 94.556	25.830
900	12.667	62.992	55.546	6.702	- 94.270	- 94.596	22.970
1000	12.980	64.344	56.359	7.984	- 94.321	- 94.628	20.680
1100	13.243	65.594	57.143	9.296	- 94.371	- 94.658	18.806
1200	13.466	66.756	57.896	10.632	- 94.419	- 94.681	17.243
1300	13.656	67.841	58.620	11.988	- 94.469	- 94.701	15.920
1400	13.815	68.859	59.315	13.362	- 94.515	- 94.716	14.785
1500	13.953	69.817	59.984	14.750	- 94.562	- 94.728	13.801
1600	14.074	70.722	60.627	16.152	- 94.607	- 94.739	12.940
1700	14.177	71.578	61.246	17.565	- 94.650	- 94.746	12.180
1800	14.269	72.391	61.843	18.987	- 94.696	- 94.750	11.504
1900	14.352	73.165	62.418	20.418	- 94.742	- 94.751	10.898
2000	14.424	73.903	62.974	21.857	- 94.788	- 94.752	10.353
2100	14.489	74.608	63.512	23.303	- 94.834	- 94.746	9.860
2200	14.547	75.284	64.031	24.755	- 94.885	- 94.744	9.411
2300	14.600	75.931	64.535	26.212	- 94.936	- 94.735	9.001
2400	14.648	76.554	65.023	27.674	- 94.991	- 94.724	8.625
2500	14.692	77.153	65.496	29.141	- 95.048	- 94.714	8.280
2600	14.734	77.730	65.956	30.613	- 95.107	- 94.698	7.960
2700	14.771	78.286	66.402	32.088	- 95.170	- 94.683	7.664
2800	14.807	78.824	66.836	33.567	- 95.235	- 94.662	7.388
2900	14.841	79.344	67.259	35.049	- 95.305	- 94.639	7.132
3000	14.873	79.848	67.670	36.535	- 95.377	- 94.615	6.892
3100	14.902	80.336	68.071	38.024	- 95.451	- 94.587	6.668
3200	14.930	80.810	68.461	39.515	- 95.530	- 94.560	6.458
3300	14.956	81.270	68.843	41.010	- 95.611	- 94.531	6.260
3400	14.982	81.717	69.215	42.507	- 95.696	- 94.495	6.074
3500	15.006	82.151	69.578	44.006	- 95.784	- 94.462	5.898
3600	15.030	82.574	69.933	45.508	- 95.874	- 94.421	5.732
3700	15.053	82.986	70.280	47.012	- 95.968	- 94.379	5.574
3800	15.075	83.388	70.620	48.518	- 96.064	- 94.331	5.425
3900	15.097	83.780	70.953	50.027	- 96.162	- 94.286	5.283
4000	15.119	84.162	71.278	51.538	- 96.263	- 94.237	5.149
4100	15.139	84.536	71.597	53.051	- 96.367	- 94.186	5.020
4200	15.159	84.901	71.909	54.566	- 96.473	- 94.130	4.898
4300	15.179	85.258	72.216	56.082	- 96.583	- 94.072	4.781
4400	15.197	85.607	72.516	57.601	- 96.694	- 94.015	4.670
4500	15.216	85.949	72.811	59.122	- 96.807	- 93.954	4.563
4600	15.234	86.284	73.100	60.644	- 96.923	- 93.885	4.460
4700	15.254	86.611	73.384	62.169	- 97.040	- 93.818	4.362
4800	15.272	86.933	73.663	63.695	- 97.160	- 93.746	4.268
4900	15.290	87.248	73.937	65.223	- 97.281	- 93.678	4.178
5000	15.306	87.557	74.206	66.753	- 97.404	- 93.609	4.091
5100	15.327	87.860	74.471	68.285	- 97.530	- 93.528	4.008
5200	15.349	88.158	74.731	69.819	- 97.656	- 93.450	3.927
5300	15.371	88.451	74.988	71.355	- 97.783	- 93.361	3.850
5400	15.393	88.738	75.239	72.893	- 97.912	- 93.280	3.775
5500	15.415	89.021	75.488	74.433	- 98.042	- 93.190	3.703
5600	15.437	89.299	75.732	75.976	- 98.173	- 93.104	3.633
5700	15.459	89.572	75.972	77.521	- 98.305	- 93.017	3.566
5800	15.481	89.841	76.209	79.068	- 98.438	- 92.918	3.501
5900	15.503	90.106	76.442	80.617	- 98.572	- 92.820	3.438
6000	15.525	90.367	76.672	82.168	- 98.707	- 92.724	3.377

March 31, 1961

JANAF THERMOCHEMICAL DATA

Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL LABORATORY, Midland, Michigan.

Acetylene (C_2H_2)

(Ideal Gas) Mol. Wt. = 26.038

T. °K.	C_p°	S°	$-(F^\circ-H^\circ_{298})/T$	$H^\circ-H^\circ_{298}$	ΔH_f°	ΔF_f°	Log K_p
	cal. mole^{-1}deg.$^{-1}$			kcal. mole^{-1}			
0	.000	.000	INFINITE	2.393	54.325	54.325	INFINITE
100	7.014	39.002	55.982	1.698	54.233	52.814	115.418
200	8.505	44.213	48.903	.938	54.234	51.383	56.146
298	10.539	48.004	48.004	.000	54.190	49.993	36.644
300	10.571	48.069	48.004	.020	54.189	49.966	36.399
400	12.065	51.326	48.438	1.155	54.138	48.567	26.534
500	13.114	54.139	49.303	2.418	54.064	47.181	20.622
600	13.931	56.604	50.319	3.771	53.961	45.813	16.687
700	14.615	58.805	51.377	5.199	53.837	44.466	13.862
800	15.239	60.798	52.432	6.693	53.707	43.137	11.784
900	15.801	62.625	53.464	8.245	53.573	41.821	10.155
1000	16.318	64.317	54.466	9.852	53.450	40.522	8.856
1100	16.789	65.895	55.434	11.507	53.333	39.234	7.795
1200	17.221	67.375	56.368	13.208	53.228	37.960	6.913
1300	17.613	68.769	57.269	14.950	53.128	36.690	6.168
1400	17.968	70.087	58.138	16.729	53.041	35.432	5.531
1500	18.291	71.338	58.977	18.543	52.961	34.177	4.979
1600	18.582	72.528	59.787	20.387	52.887	32.923	4.497
1700	18.845	73.663	60.570	22.258	52.823	31.679	4.072
1800	19.085	74.747	61.327	24.155	52.765	30.436	3.695
1900	19.302	75.785	62.061	26.074	52.714	29.199	3.358
2000	19.504	76.780	62.772	28.015	52.670	27.962	3.055
2100	19.604	77.736	63.462	29.974	52.631	26.730	2.782
2200	19.853	78.656	64.132	31.951	52.594	25.493	2.532
2300	20.004	79.541	64.783	33.944	52.564	24.266	2.306
2400	20.151	80.396	65.416	35.952	52.535	23.037	2.098
2500	20.282	81.221	66.032	37.974	52.510	21.804	1.906
2600	20.404	82.019	66.631	40.008	52.486	20.579	1.730
2700	20.519	82.791	67.216	42.055	52.466	19.349	1.566
2800	20.625	83.540	67.785	44.112	52.448	18.124	1.415
2900	20.726	84.265	68.341	46.179	52.429	16.901	1.274
3000	20.820	84.969	68.884	48.257	52.413	15.674	1.142
3100	20.910	85.654	69.414	50.343	52.399	14.451	1.019
3200	20.996	86.319	69.932	52.439	52.385	13.227	.903
3300	21.078	86.966	70.438	54.542	52.369	12.000	.795
3400	21.154	87.596	70.934	56.654	52.356	10.779	.693
3500	21.225	88.211	71.418	58.773	52.340	9.554	.597
3600	21.297	88.810	71.893	60.899	52.325	8.331	.506
3700	21.367	89.394	72.358	63.032	52.307	7.111	.420
3800	21.431	89.965	72.814	65.172	52.291	5.894	.339
3900	21.494	90.522	73.261	67.319	52.272	4.675	.262
4000	21.557	91.067	73.699	69.471	52.252	3.455	.189
4100	21.615	91.600	74.130	71.630	52.231	2.230	.119
4200	21.670	92.122	74.552	73.794	52.206	1.017	.053
4300	21.728	92.632	74.966	75.964	52.179	-.205	.010
4400	21.782	93.133	75.374	78.139	52.151	-1.425	.071
4500	21.835	93.623	75.774	80.320	52.120	-2.648	.129
4600	21.883	94.103	76.167	82.506	52.087	-3.858	.183
4700	21.935	94.574	76.554	84.697	52.052	-5.073	.236
4800	21.985	95.037	76.934	86.893	52.013	-6.286	.286
4900	22.036	95.490	77.308	89.094	51.973	-7.500	.335
5000	22.077	95.936	77.676	91.300	51.930	-8.715	.381
5100	22.129	96.374	78.038	93.510	51.881	-9.935	.426
5200	22.174	96.804	78.395	95.725	51.832	-11.144	.468
5300	22.219	97.227	78.746	97.945	51.780	-12.348	.509
5400	22.263	97.642	79.092	100.169	51.724	-13.559	.549
5500	22.309	98.051	79.434	102.397	51.663	-14.767	.587
5600	22.349	98.454	79.770	104.630	51.601	-15.977	.624
5700	22.393	98.850	80.101	106.867	51.534	-17.188	.659
5800	22.433	99.239	80.428	109.108	51.463	-18.394	.693
5900	22.474	99.623	80.750	111.354	51.390	-19.588	.726
6000	22.521	100.001	81.067	113.603	51.313	-20.802	.758

March 31, 1961

HYDROGEN, MONATOMIC (H)

(IDEAL GAS) GFW=1.0079

T, °K	gibbs/mol Cp°	S°	−(G°−H°298)/T	kcal/mol H°−H°298	ΔHf°	ΔGf°	Log Kp
0	0.000	0.000	INFINITE	−1.481	51.634	51.634	INFINITE
100	4.968	21.964	31.808	−0.984	51.772	50.778	−110.973
200	4.968	25.408	27.846	−0.488	51.947	49.716	−54.327
298	4.968	27.392	27.392	0.000	52.103	48.588	−35.616
300	4.968	27.422	27.392	0.009	52.105	48.566	−35.380
400	4.968	28.852	27.587	0.506	52.255	47.364	−25.878
500	4.968	29.960	27.955	1.003	52.402	46.124	−20.160
600	4.968	30.866	28.367	1.500	52.549	44.854	−16.338
700	4.968	31.632	28.780	1.996	52.695	43.560	−13.600
800	4.968	32.295	29.179	2.493	52.839	42.245	−11.541
900	4.968	32.880	29.558	2.990	52.980	40.913	−9.935
1000	4.968	33.404	29.917	3.487	53.118	39.564	−8.647
1100	4.968	33.877	30.256	3.984	53.252	38.203	−7.590
1200	4.968	34.309	30.576	4.480	53.381	36.829	−6.707
1300	4.968	34.707	30.878	4.977	53.504	35.444	−5.959
1400	4.968	35.075	31.165	5.474	53.623	34.051	−5.315
1500	4.968	35.418	31.437	5.971	53.736	32.649	−4.757
1600	4.968	35.739	31.696	6.468	53.845	31.239	−4.267
1700	4.968	36.040	31.943	6.964	53.948	29.823	−3.834
1800	4.968	36.324	32.179	7.461	54.046	28.401	−3.448
1900	4.968	36.592	32.404	7.958	54.140	26.974	−3.103
2000	4.968	36.847	32.620	8.455	54.229	25.542	−2.791
2100	4.968	37.090	32.827	8.952	54.315	24.106	−2.509
2200	4.968	37.321	33.026	9.448	54.396	22.665	−2.252
2300	4.968	37.542	33.218	9.945	54.473	21.221	−2.016
2400	4.968	37.753	33.402	10.442	54.547	19.774	−1.801
2500	4.968	37.956	33.580	10.939	54.617	18.324	−1.602
2600	4.968	38.151	33.752	11.436	54.684	16.871	−1.418
2700	4.968	38.338	33.919	11.932	54.748	15.415	−1.248
2800	4.968	38.519	34.080	12.429	54.808	13.957	−1.089
2900	4.968	38.693	34.236	12.926	54.866	12.497	−0.942
3000	4.968	38.862	34.387	13.423	54.921	11.035	−0.804
3100	4.968	39.024	34.534	13.920	54.973	9.572	−0.675
3200	4.968	39.182	34.677	14.416	55.023	8.106	−0.554
3300	4.968	39.335	34.816	14.913	55.070	6.639	−0.440
3400	4.968	39.483	34.951	15.410	55.114	5.171	−0.332
3500	4.968	39.627	35.083	15.907	55.156	3.701	−0.231
3600	4.968	39.767	35.211	16.404	55.196	2.231	−0.135
3700	4.968	39.903	35.336	16.900	55.234	0.759	−0.045
3800	4.968	40.036	35.458	17.397	55.268	−0.714	0.041
3900	4.968	40.165	35.577	17.894	55.301	−2.188	0.123
4000	4.968	40.291	35.693	18.391	55.331	−3.662	0.200
4100	4.968	40.413	35.807	18.888	55.360	−5.138	0.274
4200	4.968	40.533	35.918	19.384	55.386	−6.613	0.344
4300	4.968	40.650	36.026	19.881	55.410	−8.090	0.411
4400	4.968	40.764	36.133	20.378	55.432	−9.567	0.475
4500	4.968	40.876	36.237	20.875	55.451	−11.045	0.536
4600	4.968	40.985	36.339	21.372	55.469	−12.522	0.595
4700	4.968	41.092	36.439	21.868	55.484	−14.001	0.651
4800	4.968	41.197	36.537	22.365	55.498	−15.479	0.705
4900	4.968	41.299	36.633	22.862	55.510	−16.958	0.756
5000	4.968	41.399	36.728	23.359	55.519	−18.437	0.806
5100	4.968	41.498	36.820	23.855	55.527	−19.916	0.853
5200	4.968	41.594	36.911	24.352	55.533	−21.395	0.899
5300	4.968	41.689	37.000	24.849	55.538	−22.875	0.943
5400	4.968	41.782	37.088	25.346	55.541	−24.354	0.986
5500	4.968	41.873	37.174	25.843	55.543	−25.834	1.027
5600	4.968	41.962	37.259	26.339	55.543	−27.313	1.066
5700	4.968	42.050	37.342	26.836	55.542	−28.793	1.104
5800	4.968	42.137	37.424	27.333	55.540	−30.272	1.141
5900	4.968	42.222	37.505	27.830	55.537	−31.752	1.176
6000	4.968	42.305	37.584	28.327	55.532	−33.232	1.210

Dec. 31, 1960; Sept. 30, 1965; June 30, 1974; March 31, 1977

HYDROXYL. (OH)

(IDEAL GAS) GFW=17.0073

T, K	Cp°	S°	−(G°−H°ₛₛ)/T	H°−H°ₛₛ	ΔHf°	ΔGf°	Log Kp
	gibbs/mol			kcal/mol			
0	0.000	0.000	INFINITE	−2.192	9.175	9.175	INFINITE
100	7.798	35.727	50.399	−1.467	9.195	8.894	−19.438
200	7.356	40.985	44.542	−0.711	9.281	8.557	−9.350
298	7.167	43.881	43.881	0.000	9.318	8.192	−6.005
300	7.165	43.926	43.881	0.013	9.318	8.185	−5.963
400	7.087	45.574	44.161	0.725	9.328	7.806	−4.265
500	7.056	47.552	44.688	1.432	9.320	7.426	−3.246
600	7.057	48.838	45.275	2.137	9.298	7.049	−2.568
700	7.090	49.928	45.864	2.845	9.265	6.677	−2.085
800	7.150	50.878	46.433	3.556	9.225	6.309	−1.724
900	7.233	51.725	46.974	4.275	9.181	5.947	−1.444
1000	7.332	52.492	47.488	5.004	9.137	5.590	−1.222
1100	7.439	53.196	47.976	5.742	9.093	5.238	−1.041
1200	7.549	53.848	48.438	6.491	9.050	4.889	−0.890
1300	7.659	54.456	48.878	7.252	9.010	4.544	−0.764
1400	7.766	55.028	49.297	8.023	8.971	4.202	−0.656
1500	7.867	55.567	49.697	8.805	8.934	3.863	−0.563
1600	7.963	56.078	50.080	9.596	8.899	3.526	−0.482
1700	8.053	56.564	50.447	10.397	8.865	3.191	−0.410
1800	8.137	57.026	50.800	11.207	8.832	2.858	−0.347
1900	8.214	57.468	51.140	12.024	8.800	2.527	−0.291
2000	8.286	57.891	51.467	12.849	8.768	2.198	−0.240
2100	8.353	58.297	51.782	13.682	8.736	1.870	−0.195
2200	8.415	58.687	52.087	14.520	8.703	1.544	−0.153
2300	8.473	59.063	52.383	15.364	8.670	1.219	−0.116
2400	8.526	59.425	52.669	16.214	8.637	0.896	−0.082
2500	8.576	59.774	52.946	17.069	8.602	0.574	−0.050
2600	8.622	60.111	53.215	17.929	8.567	0.254	−0.021
2700	8.665	60.437	53.476	18.794	8.530	−0.065	0.005
2800	8.706	60.753	53.731	19.662	8.492	−0.383	0.030
2900	8.744	61.059	53.978	20.535	8.452	−0.699	0.053
3000	8.780	61.356	54.219	21.411	8.412	−1.014	0.074
3100	8.814	61.645	54.454	22.291	8.369	−1.327	0.094
3200	8.846	61.925	54.683	23.174	8.325	−1.640	0.112
3300	8.877	62.198	54.907	24.060	8.281	−1.950	0.129
3400	8.906	62.463	55.125	24.949	8.233	−2.260	0.145
3500	8.933	62.722	55.338	25.841	8.185	−2.567	0.160
3600	8.959	62.974	55.547	26.736	8.135	−2.874	0.174
3700	8.985	63.220	55.751	27.633	8.084	−3.179	0.188
3800	9.009	63.459	55.951	28.533	8.030	−3.483	0.200
3900	9.032	63.694	56.146	29.435	7.976	−3.785	0.212
4000	9.055	63.923	56.338	30.339	7.920	−4.086	0.223
4100	9.076	64.147	56.526	31.246	7.862	−4.386	0.234
4200	9.098	64.366	56.710	32.154	7.803	−4.683	0.244
4300	9.118	64.580	56.890	33.065	7.742	−4.980	0.253
4400	9.138	64.790	57.067	33.978	7.679	−5.275	0.262
4500	9.157	64.995	57.241	34.893	7.615	−5.569	0.270
4600	9.176	65.197	57.412	35.809	7.549	−5.861	0.278
4700	9.195	65.394	57.580	36.728	7.482	−6.152	0.286
4800	9.213	65.588	57.745	37.648	7.413	−6.441	0.293
4900	9.232	65.778	57.907	38.571	7.343	−6.729	0.300
5000	9.249	65.965	58.066	39.495	7.271	−7.016	0.307
5100	9.267	66.148	58.223	40.421	7.197	−7.300	0.313
5200	9.284	66.328	58.377	41.348	7.122	−7.584	0.319
5300	9.302	66.505	58.528	42.277	7.044	−7.866	0.324
5400	9.319	66.679	58.678	43.208	6.965	−8.147	0.330
5500	9.336	66.851	58.825	44.141	6.885	−8.426	0.335
5600	9.353	67.019	58.970	45.076	6.803	−8.703	0.340
5700	9.370	67.185	59.112	46.012	6.719	−8.979	0.344
5800	9.388	67.348	59.253	46.950	6.634	−9.254	0.349
5900	9.405	67.508	59.392	47.889	6.547	−9.527	0.353
6000	9.422	67.667	59.528	48.831	6.458	−9.799	0.357

Dec. 31, 1960; Mar. 31, 1966; Dec. 31, 1970;
July 31, 1972 (NBS); June 30, 1977

HYDROPEROXYL (HO_2) HO_2

(IDEAL GAS) GFW=33.0067

	gibbs/mol			kcal/mol			
T, K	$C_p°$	$S°$	$-(G°-H°_{298})/T$	$H°-H°_{298}$	$\Delta Hf°$	$\Delta Gf°$	Log Kp
0	0.000	0.000	INFINITE	-2.391	1.196	1.196	INFINITE
100	7.949	45.965	61.924	-1.596	0.939	1.684	-3.680
200	8.005	51.483	55.481	-0.800	0.717	2.515	-2.749
298	8.343	54.731	54.731	0.000	0.500	3.445	-2.525
300	8.352	54.783	54.731	0.015	0.496	3.463	-2.523
400	8.914	57.260	55.065	0.878	0.301	4.483	-2.449
500	9.485	59.312	55.715	1.798	0.141	5.547	-2.425
600	9.986	61.087	56.466	2.773	0.011	6.641	-2.419
700	10.411	62.659	57.240	3.793	-0.098	7.755	-2.421
800	10.775	64.073	58.007	4.853	-0.189	8.883	-2.427
900	11.094	65.361	58.754	5.947	-0.265	10.022	-2.434
1000	11.378	66.545	59.475	7.070	-0.327	11.168	-2.441
1100	11.633	67.642	60.168	8.221	-0.378	12.320	-2.448
1200	11.865	68.664	60.834	9.396	-0.419	13.477	-2.454
1300	12.078	69.622	61.473	10.594	-0.451	14.636	-2.461
1400	12.275	70.525	62.088	11.811	-0.475	15.798	-2.466
1500	12.459	71.378	62.679	13.048	-0.492	16.961	-2.471
1600	12.630	72.187	63.248	14.303	-0.503	18.124	-2.476
1700	12.791	72.958	63.797	15.574	-0.507	19.289	-2.480
1800	12.942	73.693	64.326	16.861	-0.507	20.453	-2.483
1900	13.084	74.397	64.838	18.162	-0.503	21.618	-2.487
2000	13.217	75.072	65.333	19.477	-0.494	22.782	-2.489
2100	13.341	75.719	65.812	20.805	-0.483	23.945	-2.492
2200	13.458	76.343	66.277	22.145	-0.468	25.108	-2.494
2300	13.567	76.943	66.728	23.496	-0.453	26.270	-2.496
2400	13.668	77.523	67.165	24.858	-0.435	27.432	-2.498
2500	13.761	78.083	67.591	26.230	-0.416	28.593	-2.500
2600	13.848	78.624	68.005	27.610	-0.396	29.753	-2.501
2700	13.928	79.148	68.408	28.999	-0.377	30.912	-2.502
2800	14.001	79.656	68.801	30.395	-0.358	32.070	-2.503
2900	14.068	80.149	69.184	31.799	-0.339	33.228	-2.504
3000	14.129	80.627	69.557	33.209	-0.322	34.385	-2.505
3100	14.184	81.091	69.922	34.625	-0.305	35.542	-2.506
3200	14.234	81.542	70.278	36.046	-0.291	36.698	-2.506
3300	14.279	81.981	70.626	37.471	-0.278	37.855	-2.507
3400	14.320	82.408	70.966	38.901	-0.268	39.009	-2.507
3500	14.356	82.823	71.299	40.335	-0.260	40.164	-2.508
3600	14.388	83.228	71.625	41.772	-0.255	41.320	-2.508
3700	14.416	83.623	71.944	43.213	-0.253	42.474	-2.509
3800	14.441	84.008	72.256	44.655	-0.254	43.628	-2.509
3900	14.463	84.383	72.562	46.101	-0.258	44.783	-2.510
4000	14.482	84.749	72.862	47.548	-0.265	45.939	-2.510
4100	14.498	85.107	73.157	48.997	-0.276	47.093	-2.510
4200	14.512	85.457	73.445	50.448	-0.290	48.250	-2.511
4300	14.523	85.798	73.729	51.899	-0.310	49.405	-2.511
4400	14.532	86.132	74.007	53.352	-0.332	50.562	-2.511
4500	14.540	86.459	74.280	54.806	-0.359	51.719	-2.512
4600	14.545	86.779	74.548	56.260	-0.391	52.876	-2.512
4700	14.550	87.092	74.812	57.715	-0.426	54.035	-2.513
4800	14.553	87.398	75.071	59.170	-0.466	55.194	-2.513
4900	14.554	87.698	75.325	60.625	-0.511	56.354	-2.513
5000	14.555	87.992	75.576	62.081	-0.561	57.515	-2.514
5100	14.554	88.280	75.822	63.536	-0.616	58.677	-2.514
5200	14.553	88.563	76.064	64.991	-0.676	59.841	-2.515
5300	14.550	88.840	76.303	66.447	-0.742	61.004	-2.516
5400	14.547	89.112	76.538	67.901	-0.813	62.170	-2.516
5500	14.544	89.379	76.769	69.356	-0.890	63.337	-2.517
5600	14.540	89.641	76.996	70.810	-0.972	64.505	-2.517
5700	14.535	89.898	77.220	72.264	-1.060	65.676	-2.518
5800	14.530	90.151	77.441	73.717	-1.155	66.847	-2.519
5900	14.524	90.399	77.659	75.170	-1.255	68.021	-2.520
6000	14.518	90.643	77.873	76.622	-1.363	69.196	-2.520

March 31, 1964; Sept. 30, 1978

HYDROGEN, DIATOMIC (H_2)

(REFERENCE STATE - IDEAL GAS) GFW=2.0158

	gibbs/mol			kcal/mol			
T, °K	Cp°	S°	$-(G°-H°_{298})/T$	$H°-H°_{298}$	$\Delta Hf°$	$\Delta Gf°$	Log Kp
0	0.000	0.000	INFINITE	-2.024	0.000	0.000	0.000
100	6.729	24.048	37.117	-1.307	0.000	0.000	0.000
200	6.960	28.514	31.829	-0.663	0.000	0.000	0.000
298	6.892	31.207	31.207	0.000	0.000	0.000	0.000
300	6.895	31.250	31.207	0.013	0.000	0.000	0.000
400	6.974	33.247	31.479	0.707	0.000	0.000	0.000
500	6.993	34.806	31.994	1.406	0.000	0.000	0.000
600	7.009	36.082	32.572	2.106	0.000	0.000	0.000
700	7.036	37.164	33.153	2.808	0.000	0.000	0.000
800	7.080	38.107	33.714	3.514	0.000	0.000	0.000
900	7.142	38.944	34.250	4.225	0.000	0.000	0.000
1000	7.219	39.700	34.758	4.943	0.000	0.000	0.000
1100	7.309	40.392	35.239	5.669	0.000	0.000	0.000
1200	7.407	41.033	35.695	6.405	0.000	0.000	0.000
1300	7.510	41.630	36.129	7.151	0.000	0.000	0.000
1400	7.618	42.190	36.542	7.907	0.000	0.000	0.000
1500	7.719	42.719	36.936	8.674	0.000	0.000	0.000
1600	7.821	43.220	37.314	9.451	0.000	0.000	0.000
1700	7.920	43.698	37.675	10.238	0.000	0.000	0.000
1800	8.016	44.153	38.023	11.035	0.000	0.000	0.000
1900	8.106	44.589	38.357	11.841	0.000	0.000	0.000
2000	8.193	45.007	38.679	12.656	0.000	0.000	0.000
2100	8.275	45.409	38.990	13.479	0.000	0.000	0.000
2200	8.354	45.795	39.290	14.311	0.000	0.000	0.000
2300	8.428	46.168	39.581	15.150	0.000	0.000	0.000
2400	8.499	46.529	39.863	15.996	0.000	0.000	0.000
2500	8.566	46.877	40.137	16.849	0.000	0.000	0.000
2600	8.631	47.214	40.403	17.709	0.000	0.000	0.000
2700	8.692	47.541	40.661	18.575	0.000	0.000	0.000
2800	8.752	47.858	40.913	19.448	0.000	0.000	0.000
2900	8.809	48.166	41.157	20.326	0.000	0.000	0.000
3000	8.864	48.466	41.396	21.209	0.000	0.000	0.000
3100	8.917	48.757	41.629	22.098	0.000	0.000	0.000
3200	8.969	49.041	41.856	22.993	0.000	0.000	0.000
3300	9.020	49.318	42.078	23.892	0.000	0.000	0.000
3400	9.069	49.588	42.295	24.797	0.000	0.000	0.000
3500	9.118	49.852	42.507	25.706	0.000	0.000	0.000
3600	9.165	50.109	42.715	26.620	0.000	0.000	0.000
3700	9.212	50.361	42.918	27.539	0.000	0.000	0.000
3800	9.258	50.607	43.117	28.463	0.000	0.000	0.000
3900	9.304	50.848	43.312	29.391	0.000	0.000	0.000
4000	9.349	51.085	43.504	30.324	0.000	0.000	0.000
4100	9.393	51.316	43.691	31.261	0.000	0.000	0.000
4200	9.437	51.543	43.876	32.202	0.000	0.000	0.000
4300	9.480	51.765	44.056	33.148	0.000	0.000	0.000
4400	9.523	51.984	44.234	34.098	0.000	0.000	0.000
4500	9.564	52.198	44.409	35.053	0.000	0.000	0.000
4600	9.605	52.409	44.580	36.011	0.000	0.000	0.000
4700	9.645	52.616	44.749	36.974	0.000	0.000	0.000
4800	9.684	52.819	44.915	37.940	0.000	0.000	0.000
4900	9.722	53.019	45.079	38.910	0.000	0.000	0.000
5000	9.758	53.216	45.239	39.884	0.000	0.000	0.000
5100	9.794	53.410	45.396	40.862	0.000	0.000	0.000
5200	9.827	53.600	45.554	41.843	0.000	0.000	0.000
5300	9.859	53.786	45.707	42.827	0.000	0.000	0.000
5400	9.890	53.972	45.859	43.815	0.000	0.000	0.000
5500	9.918	54.154	46.008	44.805	0.000	0.000	0.000
5600	9.945	54.333	46.155	45.798	0.000	0.000	0.000
5700	9.970	54.509	46.300	46.794	0.000	0.000	0.000
5800	9.992	54.683	46.443	47.792	0.000	0.000	0.000
5900	10.012	54.854	46.584	48.792	0.000	0.000	0.000
6000	10.030	55.022	46.723	49.795	0.000	0.000	0.000

March 31, 1961; March 31, 1977

WATER (H_2O)

(IDEAL GAS) GFW=18.0152

	cal/(mol K)			kcal/mol			
T/K	$C_p°$	$S°$	$-(G°-H°_{298})/T$	$H°-H°_{298}$	$\Delta H_f°$	$\Delta G_f°$	Log K
0	0.000	0.000	INFINITE	-2.367	-57.101	-57.101	INFINITE
100	7.559	36.396	52.205	-1.581	-57.378	-56.543	123.574
200	7.971	41.916	45.838	-0.784	-57.574	-55.632	60.791
298.15	8.026	45.106	45.106	0.000	-57.795	-54.634	40.047
300	8.030	45.156	45.106	0.015	-57.800	-54.614	39.786
373.15	8.137	46.918	45.295	0.606	-- BOILING POINT AT P=1 ATM --		
400	8.189	47.485	45.423	0.825	-58.038	-53.516	29.239
500	8.419	49.337	46.027	1.655	-58.273	-52.358	22.885
600	8.682	50.995	46.711	2.510	-58.496	-51.154	18.633
700	8.962	52.494	47.408	3.392	-58.704	-49.914	15.584
800	9.255	53.869	48.091	4.303	-58.895	-48.645	13.289
900	9.557	55.177	48.751	5.243	-59.076	-47.352	11.499
1000	9.863	56.600	49.385	6.214	-59.237	-46.041	10.062
1100	10.166	56.554	49.994	7.216	-59.381	-44.714	8.884
1200	10.461	57.451	50.579	8.247	-59.505	-43.375	7.900
1300	10.742	58.300	51.140	9.307	-59.623	-42.026	7.065
1400	11.007	59.106	51.681	10.395	-59.723	-40.668	6.349
1500	11.255	59.874	52.201	11.508	-59.812	-39.304	5.727
1600	11.484	60.607	52.704	12.645	-59.890	-37.935	5.182
1700	11.696	61.310	53.190	13.805	-59.959	-36.560	4.700
1800	11.890	61.984	53.660	14.984	-60.021	-35.182	4.272
1900	12.069	62.632	54.115	16.182	-60.076	-33.800	3.888
2000	12.232	63.255	54.556	17.397	-60.125	-32.416	3.542
2100	12.386	63.856	54.985	18.628	-60.170	-31.029	3.229
2200	12.526	64.435	55.402	19.874	-60.211	-29.641	2.944
2300	12.655	64.995	55.807	21.133	-60.249	-28.250	2.684
2400	12.773	65.536	56.201	22.405	-60.284	-26.858	2.446
2500	12.883	66.060	56.585	23.688	-60.317	-25.464	2.226
2600	12.985	66.567	56.959	24.981	-60.349	-24.069	2.023
2700	13.079	67.059	57.324	26.284	-60.380	-22.673	1.835
2800	13.167	67.536	57.680	27.597	-60.411	-21.277	1.661
2900	13.248	68.000	58.028	28.917	-60.441	-19.879	1.498
3000	13.324	68.450	58.368	30.246	-60.471	-18.479	1.346
3100	13.395	68.888	58.700	31.582	-60.501	-17.079	1.204
3200	13.461	69.314	59.025	32.925	-60.533	-15.678	1.071
3300	13.524	69.730	59.343	34.274	-60.564	-14.275	0.945
3400	13.582	70.134	59.655	35.629	-60.598	-12.873	0.827
3500	13.637	70.529	59.960	36.990	-60.631	-11.468	0.716
3600	13.689	70.914	60.259	38.357	-60.667	-10.063	0.611
3700	13.738	71.289	60.552	39.728	-60.704	-8.657	0.511
3800	13.785	71.656	60.839	41.104	-60.743	-7.250	0.417
3900	13.829	72.015	61.121	42.485	-60.782	-5.842	0.327
4000	13.870	72.366	61.398	43.870	-60.824	-4.432	0.242
4100	13.910	72.709	61.670	45.259	-60.868	-3.022	0.161
4200	13.948	73.044	61.937	46.652	-60.914	-1.610	0.084
4300	13.983	73.373	62.199	48.048	-60.962	-0.196	0.010
4400	14.018	73.695	62.456	49.449	-61.012	1.218	-0.060
4500	14.050	74.010	62.710	50.852	-61.065	2.630	-0.128
4600	14.082	74.319	62.959	52.259	-61.120	4.047	-0.192
4700	14.112	74.622	63.204	53.668	-61.178	5.464	-0.254
4800	14.141	74.920	63.445	55.081	-61.237	6.883	-0.313
4900	14.167	75.212	63.682	56.496	-61.299	8.303	-0.370
5000	14.194	75.498	63.915	57.914	-61.365	9.724	-0.425
5100	14.223	75.780	64.145	59.335	-61.432	11.148	-0.478
5200	14.252	76.056	64.372	60.759	-61.502	12.570	-0.528
5300	14.280	76.328	64.595	62.186	-61.574	13.995	-0.577
5400	14.308	76.595	64.814	63.615	-61.648	15.421	-0.624
5500	14.336	76.858	65.031	65.047	-61.724	16.849	-0.670
5600	14.364	77.116	65.244	66.482	-61.802	18.279	-0.713
5700	14.392	77.371	65.455	67.920	-61.882	19.709	-0.756
5800	14.421	77.621	65.663	69.361	-61.964	21.141	-0.797
5900	14.449	77.868	65.867	70.804	-62.047	22.576	-0.836
6000	14.477	78.111	66.069	72.250	-62.133	24.010	-0.875

Hydrogen Peroxide (H_2O_2)

(Gas) Mol. Wt. = 34.016

T, °K.	C_p° (cal. mole^{-1}deg.$^{-1}$)	S° (cal. mole^{-1}deg.$^{-1}$)	$-(F^\circ-H^\circ_{298})/T$ (cal. mole^{-1}deg.$^{-1}$)	$H^\circ-H^\circ_{298}$ (kcal. mole^{-1})	ΔH_f° (kcal. mole^{-1})	ΔF_f° (kcal. mole^{-1})	Log K_p
0	.000	.000	INFINITE	- 2.594	- 31.025	- 31.025	INFINITE
100	8.013	44.558	62.538	- 1.798	- 31.682	- 29.959	64.598
200	8.813	50.316	54.701	- .877	- 32.060	- 27.174	29.693
298	10.305	55.660	55.660	.000	- 32.530	- 25.208	18.477
300	10.330	55.724	55.660	.019	- 32.537	- 25.163	18.330
400	11.580	58.872	56.081	1.116	- 32.844	- 22.655	12.377
500	12.560	61.565	56.919	2.325	- 33.069	- 20.081	8.777
600	13.310	63.925	57.891	3.621	- 33.225	- 17.469	6.363
700	13.860	66.019	58.905	4.980	- 33.345	- 14.832	4.630
800	14.300	67.900	59.914	6.389	- 33.440	- 12.181	3.328
900	14.690	69.607	60.897	7.839	- 33.516	- 9.519	2.311
1000	15.020	71.173	61.848	9.325	- 33.576	- 6.850	1.497
1100	15.330	72.619	62.762	10.843	- 33.622	- 4.173	.829
1200	15.610	73.965	63.640	12.390	- 33.658	- 1.495	.272
1300	15.870	75.225	64.483	13.964	- 33.684	1.186	- .199
1400	16.110	76.410	65.293	15.563	- 33.703	3.870	- .604
1500	16.330	77.529	66.072	17.185	- 33.718	6.554	- .955

INTERIM TABLE Issued December 31, 1960.

JANAF THERMOCHEMICAL DATA

Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL LABORATORY, Midland, Michigan

NITROGEN, MONATOMIC (N)

(IDEAL GAS) GFW=14.0067

T, °K	Cp°	S°	−(G°−H°298)/T	H°−H°298	ΔHf°	ΔGf°	Log Kp
	gibbs/mol			kcal/mol			
0	0.000	0.000	INFINITE	−1.481	112.530	112.530	INFINITE
100	4.966	31.186	41.030	−0.984	112.680	111.470	−243.615
200	4.968	34.630	37.068	−0.488	112.829	110.202	−120.422
298	4.968	36.613	36.613	0.000	112.975	108.882	−79.812
300	4.968	36.644	36.614	0.009	112.978	108.857	−79.301
400	4.968	38.073	36.808	0.506	113.126	107.460	−58.715
500	4.968	39.182	37.176	1.003	113.271	106.027	−46.344
600	4.968	40.088	37.588	1.500	113.412	104.565	−38.087
700	4.968	40.854	38.002	1.996	113.545	103.080	−32.182
800	4.968	41.517	38.400	2.493	113.670	101.576	−27.749
900	4.968	42.102	38.780	2.990	113.788	100.057	−24.297
1000	4.968	42.626	39.139	3.487	113.897	98.525	−21.532
1100	4.968	43.099	39.478	3.984	114.000	96.983	−19.269
1200	4.968	43.531	39.798	4.480	114.097	95.432	−17.380
1300	4.968	43.929	40.100	4.977	114.188	93.873	−15.781
1400	4.968	44.297	40.387	5.474	114.274	92.307	−14.410
1500	4.968	44.640	40.659	5.971	114.356	90.735	−13.220
1600	4.968	44.961	40.918	6.468	114.435	89.158	−12.178
1700	4.968	45.262	41.165	6.964	114.511	87.576	−11.258
1800	4.968	45.546	41.401	7.461	114.583	85.989	−10.440
1900	4.968	45.814	41.626	7.958	114.654	84.399	−9.708
2000	4.969	46.069	41.842	8.455	114.722	82.804	−9.048
2100	4.970	46.312	42.049	8.952	114.788	81.207	−8.451
2200	4.971	46.543	42.248	9.449	114.852	79.606	−7.908
2300	4.972	46.764	42.439	9.946	114.915	78.003	−7.412
2400	4.975	46.975	42.624	10.443	114.977	76.397	−6.957
2500	4.978	47.179	42.802	10.941	115.038	74.788	−6.538
2600	4.982	47.374	42.974	11.439	115.097	73.176	−6.151
2700	4.987	47.562	43.141	11.937	115.156	71.563	−5.793
2800	4.993	47.743	43.302	12.436	115.215	69.947	−5.460
2900	5.001	47.919	43.458	12.936	115.274	68.330	−5.149
3000	5.010	48.088	43.610	13.436	115.332	66.710	−4.860
3100	5.021	48.253	43.757	13.938	115.391	65.089	−4.589
3200	5.034	48.413	43.900	14.441	115.449	63.465	−4.336
3300	5.049	48.568	44.039	14.945	115.510	61.840	−4.095
3400	5.066	48.719	44.174	15.451	115.570	60.212	−3.870
3500	5.085	48.866	44.306	15.958	115.632	58.583	−3.658
3600	5.106	49.009	44.435	16.468	115.695	56.952	−3.457
3700	5.130	49.150	44.560	16.980	115.760	55.320	−3.268
3800	5.155	49.287	44.683	17.494	115.827	53.685	−3.088
3900	5.183	49.421	44.803	18.011	115.896	52.049	−2.917
4000	5.212	49.553	44.920	18.531	115.967	50.411	−2.754
4100	5.244	49.682	45.034	19.053	116.041	48.771	−2.600
4200	5.278	49.808	45.147	19.579	116.118	47.129	−2.452
4300	5.313	49.933	45.257	20.109	116.197	45.486	−2.312
4400	5.351	50.056	45.364	20.642	116.280	43.841	−2.178
4500	5.390	50.176	45.470	21.179	116.366	42.193	−2.049
4600	5.431	50.295	45.573	21.720	116.456	40.544	−1.926
4700	5.473	50.412	45.675	22.265	116.550	38.893	−1.808
4800	5.516	50.528	45.775	22.815	116.647	37.239	−1.696
4900	5.561	50.642	45.873	23.369	116.748	35.584	−1.587
5000	5.607	50.755	45.970	23.927	116.854	33.927	−1.483
5100	5.654	50.867	46.065	24.490	116.964	32.267	−1.383
5200	5.702	50.977	46.158	25.058	117.078	30.605	−1.286
5300	5.751	51.086	46.250	25.631	117.197	28.941	−1.193
5400	5.800	51.194	46.341	26.208	117.320	27.275	−1.104
5500	5.849	51.301	46.430	26.791	117.447	25.606	−1.017
5600	5.899	51.407	46.518	27.378	117.580	23.935	−0.934
5700	5.949	51.512	46.604	27.970	117.716	22.262	−0.854
5800	6.000	51.615	46.690	28.568	117.858	20.586	−0.776
5900	6.050	51.718	46.774	29.170	118.003	18.907	−0.700
6000	6.100	51.821	46.857	29.778	118.154	17.227	−0.627

March 31, 1961; March 31, 1977

Nitric Oxide (NO)

(Ideal Gas) Mol. wt. = 30.008

T. °K.	C_p°	S°	$-(F^\circ-H^\circ_{298})/T$	$H^\circ-H^\circ_{298}$	ΔH_f°	ΔF_f°	Log K_p
	cal. mole^{-1}deg.$^{-1}$			kcal. mole^{-1}			
0	.000	.000	INFINITE	- 2.197	21.456	21.456	INFINITE
100	7.721	42.286	56.801	- 1.451	21.503	21.256	- 46.493
200	7.271	47.477	51.003	- .705	21.558	20.984	- 22.929
298	7.133	50.347	50.347	.000	21.580	20.697	- 15.171
300	7.132	50.392	50.348	.013	21.580	20.692	- 15.073
400	7.157	52.444	50.627	.727	21.590	20.394	- 11.142
500	7.287	54.093	51.157	1.448	21.594	20.095	- 8.783
600	7.486	55.397	51.755	2.186	21.598	19.795	- 7.210
700	7.655	56.562	52.360	2.942	21.601	19.494	- 6.086
800	7.832	57.596	52.951	3.716	21.605	19.192	- 5.243
900	7.988	58.528	53.520	4.507	21.610	18.890	- 4.587
1000	8.123	59.377	54.064	5.313	21.615	18.588	- 4.062
1100	8.238	60.157	54.583	6.131	21.620	18.285	- 3.633
1200	8.336	60.878	55.078	6.960	21.624	17.981	- 3.275
1300	8.419	61.548	55.550	7.798	21.628	17.676	- 2.972
1400	8.491	62.175	56.001	8.644	21.631	17.373	- 2.712
1500	8.552	62.763	56.432	9.498	21.633	17.069	- 2.487
1600	8.605	63.317	56.845	10.354	21.635	16.765	- 2.290
1700	8.651	63.840	57.242	11.217	21.635	16.461	- 2.118
1800	8.692	64.335	57.622	12.084	21.635	16.156	- 1.962
1900	8.727	64.806	57.988	12.955	21.630	15.853	- 1.823
2000	8.759	65.255	58.340	13.829	21.626	15.548	- 1.699
2100	8.788	65.683	58.680	14.706	21.619	15.244	- 1.586
2200	8.813	66.092	59.007	15.587	21.611	14.941	- 1.484
2300	8.837	66.484	59.324	16.469	21.601	14.637	- 1.391
2400	8.858	66.861	59.630	17.354	21.589	14.336	- 1.305
2500	8.877	67.223	59.927	18.241	21.574	14.033	- 1.227
2600	8.895	67.571	60.214	19.129	21.558	13.732	- 1.154
2700	8.912	67.908	60.493	20.020	21.540	13.432	- 1.087
2800	8.927	68.232	60.763	20.911	21.520	13.132	- 1.025
2900	8.941	68.545	61.026	21.805	21.498	12.834	- .967
3000	8.955	68.849	61.282	22.700	21.474	12.535	- .913
3100	8.968	69.143	61.531	23.596	21.449	12.237	- .863
3200	8.980	69.427	61.773	24.493	21.421	11.940	- .815
3300	8.991	69.704	62.010	25.392	21.392	11.644	- .771
3400	9.002	69.973	62.240	26.291	21.361	11.349	- .729
3500	9.012	70.234	62.464	27.192	21.329	11.054	- .690
3600	9.022	70.488	62.684	28.094	21.294	10.762	- .653
3700	9.032	70.735	62.898	28.997	21.259	10.470	- .618
3800	9.041	70.976	63.108	29.900	21.222	10.179	- .585
3900	9.050	71.211	63.312	30.805	21.185	9.889	- .554
4000	9.058	71.440	63.513	31.710	21.145	9.598	- .524
4100	9.066	71.664	63.709	32.616	21.104	9.311	- .496
4200	9.074	71.882	63.901	33.523	21.063	9.024	- .470
4300	9.082	72.096	64.089	34.431	21.021	8.739	- .444
4400	9.090	72.305	64.273	35.340	20.977	8.452	- .420
4500	9.097	72.509	64.454	36.249	20.932	8.169	- .397
4600	9.105	72.709	64.631	37.159	20.887	7.888	- .375
4700	9.112	72.905	64.805	38.070	20.841	7.605	- .354
4800	9.119	73.097	64.976	38.982	20.794	7.324	- .333
4900	9.125	73.285	65.144	39.894	20.747	7.040	- .314
5000	9.132	73.470	65.308	40.807	20.699	6.763	- .296
5100	9.139	73.651	65.470	41.720	20.650	6.484	- .278
5200	9.145	73.828	65.629	42.634	20.601	6.207	- .261
5300	9.152	74.002	65.786	43.549	20.551	5.932	- .245
5400	9.158	74.173	65.939	44.465	20.501	5.654	- .229
5500	9.164	74.342	66.091	45.381	20.451	5.383	- .214
5600	9.170	74.507	66.239	46.298	20.400	5.107	- .199
5700	9.176	74.669	66.386	47.215	20.348	4.835	- .185
5800	9.182	74.829	66.530	48.133	20.297	4.566	- .172
5900	9.188	74.986	66.672	49.051	20.245	4.292	- .159
6000	9.194	75.140	66.812	49.970	20.192	4.024	- .147

Dec. 31, 1960; June 30, 1963

JANAF THERMOCHEMICAL DATA
Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL LABORATORY, Midland, Michigan.

NITROGEN, DIATOMIC (N_2)

N_2

(REFERENCE STATE - IDEAL GAS) GFW=28.0134

	gibbs/mol			kcal/mol			
T, °K	Cp°	S°	$-(G°-H°_{298})/T$	$H°-H°_{298}$	$\Delta Hf°$	$\Delta Gf°$	Log Kp
0	0.000	0.000	INFINITE	-2.072	0.000	0.000	0.000
100	6.956	38.170	51.955	-1.379	0.000	0.000	0.000
200	6.957	42.991	46.406	-0.683	0.000	0.000	0.000
298	6.961	45.770	45.770	0.000	0.000	0.000	0.000
300	6.961	45.813	45.770	0.013	0.000	0.000	0.000
400	6.991	47.818	46.043	0.710	0.000	0.000	0.000
500	7.070	49.386	46.560	1.413	0.000	0.000	0.000
600	7.196	50.685	47.142	2.126	0.000	0.000	0.000
700	7.350	51.806	47.730	2.853	0.000	0.000	0.000
800	7.513	52.798	48.303	3.596	0.000	0.000	0.000
900	7.670	53.692	48.853	4.355	0.000	0.000	0.000
1000	7.815	54.508	49.378	5.130	0.000	0.000	0.000
1100	7.945	55.259	49.879	5.918	0.000	0.000	0.000
1200	8.060	55.955	50.357	6.718	0.000	0.000	0.000
1300	8.161	56.605	50.813	7.529	0.000	0.000	0.000
1400	8.250	57.213	51.248	8.350	0.000	0.000	0.000
1500	8.328	57.785	51.665	9.179	0.000	0.000	0.000
1600	8.396	58.324	52.065	10.015	0.000	0.000	0.000
1700	8.456	58.835	52.448	10.858	0.000	0.000	0.000
1800	8.508	59.320	52.816	11.706	0.000	0.000	0.000
1900	8.555	59.781	53.171	12.559	0.000	0.000	0.000
2000	8.597	60.221	53.513	13.417	0.000	0.000	0.000
2100	8.634	60.641	53.842	14.279	0.000	0.000	0.000
2200	8.668	61.044	54.160	15.144	0.000	0.000	0.000
2300	8.699	61.430	54.468	16.012	0.000	0.000	0.000
2400	8.726	61.801	54.766	16.883	0.000	0.000	0.000
2500	8.751	62.157	55.055	17.757	0.000	0.000	0.000
2600	8.775	62.501	55.334	18.634	0.000	0.000	0.000
2700	8.796	62.833	55.606	19.512	0.000	0.000	0.000
2800	8.815	63.153	55.870	20.393	0.000	0.000	0.000
2900	8.833	63.463	56.126	21.275	0.000	0.000	0.000
3000	8.850	63.762	56.376	22.159	0.000	0.000	0.000
3100	8.866	64.053	56.619	23.045	0.000	0.000	0.000
3200	8.881	64.335	56.856	23.933	0.000	0.000	0.000
3300	8.895	64.608	57.086	24.821	0.000	0.000	0.000
3400	8.908	64.874	57.312	25.711	0.000	0.000	0.000
3500	8.920	65.132	57.531	26.603	0.000	0.000	0.000
3600	8.932	65.384	57.746	27.496	0.000	0.000	0.000
3700	8.944	65.629	57.956	28.389	0.000	0.000	0.000
3800	8.954	65.867	58.161	29.284	0.000	0.000	0.000
3900	8.965	66.100	58.361	30.180	0.000	0.000	0.000
4000	8.975	66.327	58.558	31.077	0.000	0.000	0.000
4100	8.984	66.549	58.750	31.975	0.000	0.000	0.000
4200	8.993	66.765	58.938	32.874	0.000	0.000	0.000
4300	9.002	66.977	59.123	33.774	0.000	0.000	0.000
4400	9.011	67.184	59.304	34.674	0.000	0.000	0.000
4500	9.020	67.387	59.481	35.576	0.000	0.000	0.000
4600	9.028	67.585	59.655	36.478	0.000	0.000	0.000
4700	9.036	67.779	59.826	37.382	0.000	0.000	0.000
4800	9.045	67.970	59.993	38.286	0.000	0.000	0.000
4900	9.053	68.156	60.158	39.191	0.000	0.000	0.000
5000	9.061	68.339	60.320	40.096	0.000	0.000	0.000
5100	9.070	68.519	60.479	41.003	0.000	0.000	0.000
5200	9.078	68.695	60.635	41.910	0.000	0.000	0.000
5300	9.085	68.868	60.789	42.818	0.000	0.000	0.000
5400	9.093	69.038	60.940	43.727	0.000	0.000	0.000
5500	9.101	69.205	61.089	44.637	0.000	0.000	0.000
5600	9.110	69.369	61.235	45.547	0.000	0.000	0.000
5700	9.119	69.530	61.379	46.459	0.000	0.000	0.000
5800	9.128	69.689	61.521	47.371	0.000	0.000	0.000
5900	9.138	69.845	61.661	48.285	0.000	0.000	0.000
6000	9.148	69.999	61.799	49.199	0.000	0.000	0.000

Dec. 31, 1960; March 31, 1961; Sept. 30, 1963;
March 31, 1977

OXYGEN, MONATOMIC (O)
(IDEAL GAS) GFW=15.9994

JANAF THERMOCHEMICAL DATA

Compiled and Calculated by THE DOW CHEMICAL COMPANY, THERMAL RESEARCH LABORATORY, Midland, Michigan

	gibbs/mol			kcal/mol			
T, °K	Cp°	S°	-(G°-H°298)/T	H°-H°298	ΔHf°	ΔGf°	Log Kp
0	0.000	0.000	INFINITE	-1.607	58.984	58.984	INFINITE
100	5.465	32.466	43.265	-1.080	59.164	57.988	-126.730
200	5.433	36.339	38.952	-0.523	59.374	56.728	-61.988
298	5.237	38.468	38.468	0.000	59.554	55.390	-40.602
300	5.234	38.500	38.468	0.010	59.557	55.364	-40.332
400	5.134	39.991	38.672	0.528	59.720	53.942	-29.472
500	5.081	41.130	39.054	1.038	59.865	52.480	-22.939
600	5.049	42.053	39.479	1.544	59.994	50.991	-18.573
700	5.029	42.830	39.904	2.048	60.109	49.481	-15.448
800	5.015	43.501	40.313	2.550	60.212	47.955	-13.101
900	5.006	44.091	40.700	3.051	60.306	46.418	-11.272
1000	4.999	44.618	41.066	3.552	60.393	44.870	-9.806
1100	4.994	45.094	41.411	4.051	60.473	43.314	-8.606
1200	4.990	45.528	41.736	4.550	60.548	41.751	-7.604
1300	4.987	45.927	42.043	5.049	60.619	40.181	-6.755
1400	4.984	46.297	42.334	5.548	60.685	38.607	-6.027
1500	4.982	46.641	42.610	6.046	60.748	37.027	-5.395
1600	4.981	46.962	42.872	6.544	60.808	35.444	-4.841
1700	4.979	47.264	43.122	7.042	60.865	33.857	-4.353
1800	4.978	47.549	43.360	7.540	60.919	32.267	-3.918
1900	4.978	47.818	43.587	8.038	60.970	30.673	-3.528
2000	4.978	48.073	43.805	8.536	61.018	29.078	-3.177
2100	4.978	48.316	44.014	9.033	61.063	27.480	-2.860
2200	4.978	48.548	44.215	9.531	61.106	25.879	-2.571
2300	4.980	48.769	44.408	10.029	61.146	24.277	-2.307
2400	4.981	48.981	44.595	10.527	61.183	22.673	-2.065
2500	4.983	49.184	44.774	11.025	61.219	21.066	-1.842
2600	4.986	49.380	44.948	11.524	61.252	19.461	-1.636
2700	4.990	49.568	45.115	12.023	61.282	17.854	-1.445
2800	4.994	49.750	45.277	12.522	61.311	16.245	-1.268
2900	4.999	49.925	45.435	13.021	61.338	14.635	-1.103
3000	5.004	50.094	45.587	13.522	61.362	13.023	-0.949
3100	5.010	50.259	45.735	14.022	61.386	11.412	-0.805
3200	5.017	50.418	45.879	14.524	61.407	9.799	-0.669
3300	5.024	50.572	46.019	15.026	61.428	8.187	-0.542
3400	5.032	50.722	46.155	15.528	61.447	6.573	-0.422
3500	5.041	50.868	46.288	16.032	61.465	4.959	-0.310
3600	5.050	51.011	46.417	16.537	61.482	3.344	-0.203
3700	5.060	51.149	46.543	17.042	61.498	1.729	-0.102
3800	5.070	51.284	46.666	17.549	61.514	0.113	-0.006
3900	5.080	51.416	46.786	18.056	61.529	-1.503	0.084
4000	5.091	51.545	46.903	18.565	61.543	-3.119	0.170
4100	5.102	51.671	47.018	19.075	61.557	-4.736	0.252
4200	5.114	51.794	47.130	19.585	61.571	-6.353	0.331
4300	5.126	51.914	47.240	20.097	61.584	-7.971	0.405
4400	5.137	52.032	47.348	20.610	61.597	-9.588	0.476
4500	5.149	52.148	47.453	21.125	61.610	-11.206	0.544
4600	5.162	52.261	47.557	21.640	61.622	-12.825	0.609
4700	5.174	52.372	47.658	22.157	61.634	-14.443	0.672
4800	5.186	52.481	47.757	22.675	61.646	-16.062	0.731
4900	5.198	52.588	47.855	23.194	61.658	-17.681	0.789
5000	5.210	52.693	47.950	23.715	61.669	-19.300	0.844
5100	5.222	52.797	48.044	24.236	61.680	-20.919	0.896
5200	5.234	52.898	48.137	24.759	61.690	-22.539	0.947
5300	5.246	52.998	48.228	25.283	61.699	-24.159	0.996
5400	5.257	53.096	48.317	25.808	61.709	-25.779	1.043
5500	5.269	53.193	48.405	26.335	61.717	-27.399	1.089
5600	5.280	53.288	48.491	26.862	61.724	-29.020	1.133
5700	5.291	53.381	48.576	27.391	61.731	-30.640	1.175
5800	5.302	53.473	48.660	27.920	61.736	-32.261	1.216
5900	5.313	53.564	48.742	28.451	61.740	-33.882	1.255
6000	5.323	53.654	48.823	28.983	61.743	-35.502	1.293

June 30, 1962; June 30, 1974; March 31, 1977

Oxygen, Diatomic (O_2)

O_2

(Reference State - Ideal Gas) GFW=31.9988

	gibbs/mol			kcal/mol			
T, °K	Cp°	S°	$-(G°-H°_{298})/T$	$H°-H°_{298}$	$\Delta Hf°$	$\Delta Gf°$	Log Kp
0	0.000	0.000	INFINITE	-2.075	0.000	0.000	0.000
100	6.950	41.355	55.206	-1.381	0.000	0.000	0.000
200	6.961	46.218	49.645	-0.685	0.000	0.000	0.000
298	7.021	49.005	49.005	0.000	0.000	0.000	0.000
300	7.023	49.049	49.005	0.013	0.000	0.000	0.000
400	7.196	51.090	49.283	0.723	0.000	0.000	0.000
500	7.431	52.721	49.812	1.454	0.000	0.000	0.000
600	7.670	54.097	50.415	2.209	0.000	0.000	0.000
700	7.883	55.296	51.028	2.987	0.000	0.000	0.000
800	8.062	56.360	51.629	3.785	0.000	0.000	0.000
900	8.211	57.319	52.209	4.599	0.000	0.000	0.000
1000	8.334	58.190	52.764	5.426	0.000	0.000	0.000
1100	8.437	58.990	53.294	6.265	0.000	0.000	0.000
1200	8.525	59.728	53.800	7.113	0.000	0.000	0.000
1300	8.601	60.413	54.283	7.969	0.000	0.000	0.000
1400	8.670	61.053	54.744	8.833	0.000	0.000	0.000
1500	8.734	61.653	55.185	9.703	0.000	0.000	0.000
1600	8.795	62.219	55.607	10.580	0.000	0.000	0.000
1700	8.853	62.754	56.012	11.462	0.000	0.000	0.000
1800	8.909	63.262	56.400	12.350	0.000	0.000	0.000
1900	8.965	63.745	56.774	13.244	0.000	0.000	0.000
2000	9.020	64.206	57.134	14.143	0.000	0.000	0.000
2100	9.075	64.648	57.482	15.048	0.000	0.000	0.000
2200	9.129	65.071	57.817	15.958	0.000	0.000	0.000
2300	9.182	65.478	58.141	16.874	0.000	0.000	0.000
2400	9.235	65.870	58.455	17.795	0.000	0.000	0.000
2500	9.287	66.248	58.760	18.721	0.000	0.000	0.000
2600	9.337	66.613	59.055	19.652	0.000	0.000	0.000
2700	9.387	66.966	59.341	20.588	0.000	0.000	0.000
2800	9.435	67.309	59.620	21.529	0.000	0.000	0.000
2900	9.482	67.641	59.891	22.475	0.000	0.000	0.000
3000	9.528	67.963	60.154	23.426	0.000	0.000	0.000
3100	9.572	68.276	60.411	24.381	0.000	0.000	0.000
3200	9.614	68.581	60.662	25.340	0.000	0.000	0.000
3300	9.655	68.877	60.906	26.303	0.000	0.000	0.000
3400	9.694	69.166	61.145	27.271	0.000	0.000	0.000
3500	9.731	69.447	61.378	28.242	0.000	0.000	0.000
3600	9.768	69.722	61.606	29.217	0.000	0.000	0.000
3700	9.802	69.990	61.829	30.196	0.000	0.000	0.000
3800	9.836	70.252	62.047	31.178	0.000	0.000	0.000
3900	9.868	70.508	62.261	32.163	0.000	0.000	0.000
4000	9.900	70.758	62.470	33.151	0.000	0.000	0.000
4100	9.930	71.003	62.675	34.143	0.000	0.000	0.000
4200	9.960	71.243	62.877	35.137	0.000	0.000	0.000
4300	9.990	71.477	63.074	36.135	0.000	0.000	0.000
4400	10.019	71.707	63.267	37.135	0.000	0.000	0.000
4500	10.048	71.933	63.458	38.138	0.000	0.000	0.000
4600	10.077	72.154	63.644	39.145	0.000	0.000	0.000
4700	10.107	72.371	63.828	40.154	0.000	0.000	0.000
4800	10.137	72.584	64.008	41.166	0.000	0.000	0.000
4900	10.168	72.793	64.185	42.181	0.000	0.000	0.000
5000	10.200	72.999	64.359	43.200	0.000	0.000	0.000
5100	10.232	73.201	64.531	44.221	0.000	0.000	0.000
5200	10.267	73.401	64.699	45.246	0.000	0.000	0.000
5300	10.302	73.596	64.865	46.275	0.000	0.000	0.000
5400	10.340	73.789	65.029	47.307	0.000	0.000	0.000
5500	10.379	73.979	65.190	48.343	0.000	0.000	0.000
5600	10.420	74.167	65.348	49.383	0.000	0.000	0.000
5700	10.464	74.352	65.505	50.427	0.000	0.000	0.000
5800	10.510	74.534	65.659	51.476	0.000	0.000	0.000
5900	10.558	74.714	65.811	52.529	0.000	0.000	0.000
6000	10.609	74.892	65.961	53.587	0.000	0.000	0.000

Dec. 31, 1960; March 31, 1961; Sept. 30, 1965;
March 31, 1977

JANAF THERMOCHEMICAL DATA

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