

THERMODYNAMIC PROPERTIES AS A FUNCTION OF TEMPERATURE (continued)

T/K	J/K·mol			kJ/mol			Log K_f
	C_p°	S°	$-(G^\circ - H^\circ(T_f))/T$	$H^\circ - H^\circ(T_f)$	$\Delta_f H^\circ$	$\Delta_f G^\circ$	
9. CARBON OXIDE							
	CO (g)						
298.15	29.141	197.658	197.658	0.000	-110.530	-137.168	24.031
300	29.142	197.838	197.659	0.054	-110.519	-137.333	23.912
400	29.340	206.243	198.803	2.976	-110.121	-146.341	19.110
500	29.792	212.834	200.973	5.930	-110.027	-155.412	16.236
600	30.440	218.321	203.419	8.941	-110.157	-164.480	14.319
700	31.170	223.067	205.895	12.021	-110.453	-173.513	12.948
800	31.898	227.277	208.309	15.175	-110.870	-182.494	11.915
900	32.573	231.074	210.631	18.399	-111.378	-191.417	11.109
1000	33.178	234.538	212.851	21.687	-111.952	-200.281	10.461
1100	33.709	237.726	214.969	25.032	-112.573	-209.084	9.928
1200	34.169	240.679	216.990	28.426	-113.228	-217.829	9.482
1300	34.568	243.430	218.920	31.864	-113.904	-226.518	9.101
1400	34.914	246.005	220.763	35.338	-114.594	-235.155	8.774
1500	35.213	248.424	222.527	38.845	-115.291	-243.742	8.488
51. DIHYDROGEN							
	H₂ (g)						
298.15	28.836	130.680	130.680	0.000	0.000	0.000	0.000
300	28.849	130.858	130.680	0.053	0.000	0.000	0.000
400	29.181	139.217	131.818	2.960	0.000	0.000	0.000
500	29.260	145.738	133.974	5.882	0.000	0.000	0.000
600	29.327	151.078	136.393	8.811	0.000	0.000	0.000
700	29.440	155.607	138.822	11.749	0.000	0.000	0.000
800	29.623	159.549	141.172	14.702	0.000	0.000	0.000
900	29.880	163.052	143.412	17.676	0.000	0.000	0.000
1000	30.204	166.217	145.537	20.680	0.000	0.000	0.000
1100	30.580	169.113	147.550	23.719	0.000	0.000	0.000
1200	30.991	171.791	149.460	26.797	0.000	0.000	0.000
1300	31.422	174.288	151.275	29.918	0.000	0.000	0.000
1400	31.860	176.633	153.003	33.082	0.000	0.000	0.000
1500	32.296	178.846	154.653	36.290	0.000	0.000	0.000

THERMODYNAMIC PROPERTIES AS A FUNCTION OF TEMPERATURE (continued)

<i>T</i> /K	J/K·mol			kJ/mol			Log <i>K_f</i>
	<i>C_p</i> ^o	<i>S</i> ^o	-(<i>G</i> ^o - <i>H</i> ^o (<i>T_r</i>))/ <i>T</i>	<i>H</i> ^o - <i>H</i> ^o (<i>T_r</i>)	Δ _{<i>r</i>} <i>H</i> ^o	Δ _{<i>r</i>} <i>G</i> ^o	
11. METHANE CH₄ (g)							
298.15	35.695	186.369	186.369	0.000	-74.600	-50.530	8.853
300	35.765	186.590	186.370	0.066	-74.656	-50.381	8.772
400	40.631	197.501	187.825	3.871	-77.703	-41.827	5.462
500	46.627	207.202	190.744	8.229	-80.520	-32.525	3.398
600	52.742	216.246	194.248	13.199	-82.969	-22.690	1.975
700	58.603	224.821	198.008	18.769	-85.023	-12.476	0.931
800	64.084	233.008	201.875	24.907	-86.693	-1.993	0.130
11. METHANE CH₄ (g) (continued)							
900	69.137	240.852	205.773	31.571	-88.006	8.677	-0.504
1000	73.746	248.379	209.660	38.719	-88.996	19.475	-1.017
1100	77.919	255.607	213.511	46.306	-89.698	30.358	-1.442
1200	81.682	262.551	217.310	54.289	-90.145	41.294	-1.797
1300	85.067	269.225	221.048	62.630	-90.367	52.258	-2.100
1400	88.112	275.643	224.720	71.291	-90.390	63.231	-2.359
1500	90.856	281.817	228.322	80.242	-90.237	74.200	-2.584

THERMODYNAMIC PROPERTIES AS A FUNCTION OF TEMPERATURE (continued)

<i>T</i> /K	J/K·mol			kJ/mol			Log <i>K_f</i>
	<i>C_p</i> ^o	<i>S</i> ^o	-(<i>G</i> ^o - <i>H</i> ^o (<i>T_f</i>))/ <i>T</i>	<i>H</i> ^o - <i>H</i> ^o (<i>T_f</i>)	Δ _{<i>f</i>} <i>H</i> ^o	Δ _{<i>f</i>} <i>G</i> ^o	
53. WATER	H₂O (l)						
298.15	75.300	69.950	69.950	0.000	-285.830	-237.141	41.546
300	75.281	70.416	69.951	0.139	-285.771	-236.839	41.237
373.21	76.079	86.896	71.715	5.666	-283.454	-225.160	31.513
54. WATER	H₂O (g)						
298.15	33.598	188.832	188.832	0.000	-241.826	-228.582	40.046
54. WATER	H₂O (g) (continued)						
300	33.606	189.040	188.833	0.062	-241.844	-228.500	39.785
400	34.283	198.791	190.158	3.453	-242.845	-223.900	29.238
500	35.259	206.542	192.685	6.929	-243.822	-219.050	22.884
600	36.371	213.067	195.552	10.509	-244.751	-214.008	18.631
700	37.557	218.762	198.469	14.205	-245.620	-208.814	15.582
800	38.800	223.858	201.329	18.023	-246.424	-203.501	13.287
900	40.084	228.501	204.094	21.966	-247.158	-198.091	11.497
1000	41.385	232.792	206.752	26.040	-247.820	-192.603	10.060
1100	42.675	236.797	209.303	30.243	-248.410	-187.052	8.882
1200	43.932	240.565	211.753	34.574	-248.933	-181.450	7.898
1300	45.138	244.129	214.108	39.028	-249.392	-175.807	7.064
1400	46.281	247.516	216.374	43.599	-249.792	-170.132	6.348
1500	47.356	250.746	218.559	48.282	-250.139	-164.429	5.726

ENTHALPY OF VAPORIZATION (continued)

Mol. Form.	Name	$t_b/^\circ\text{C}$	$\Delta_{\text{vap}}H(t_b)$ kJ/mol	$\Delta_{\text{vap}}H(25^\circ\text{C})$ kJ/mol
HNO ₃	Nitric acid	83		39.1
HN ₃	Hydrazoic acid	35.7	30.5	
HNaO	Sodium hydroxide	1388	175	
H ₂	Hydrogen	-252.87	0.90	
H ₂ O	Water	100.0	40.65	43.98
H ₂ O ₂	Hydrogen peroxide	150.2		51.6
H ₂ S	Hydrogen sulfide	-59.55	18.67	14.08
H ₂ S ₂	Hydrogen disulfide	70.7		33.78
H ₂ Se	Hydrogen selenide	-41.25	19.7	
H ₂ Te	Hydrogen telluride	-2	19.2	
H ₃ N	Ammonia	-33.33	23.33	19.86
H ₃ P	Phosphine	-87.75	14.6	
H ₃ Sb	Stibine	-17	21.3	
H ₄ N ₂	Hydrazine	113.55	41.8	44.7
H ₄ P ₂	Diphosphine	63.5	28.8	
H ₄ Si	Silane	-111.9	12.1	
H ₄ Sn	Stannane	-51.8	19.05	
H ₆ Si ₂	Disilane	-14.3	21.2	
H ₈ Si ₃	Trisilane	52.9	28.5	
He	Helium	-268.93	0.08	
Hg	Mercury	356.73	59.11	
HgI ₂	Mercury(II) iodide	354	59.2	
In	Indium(I) iodide	712	90.8	
ITl	Thallium(I) iodide	824	104.7	
I ₂	Iodine	184.4	41.57	
I ₂ Pb	Lead(II) iodide	872	104	
I ₂ Sn	Tin(II) iodide	714	105	
I ₃ P	Phosphorus(III) iodide	227	43.9	
I ₃ Sb	Antimony(III) iodide	401	68.6	
I ₄ Si	Tetraiodosilane	287.35	50.2	
I ₄ Sn	Tin(IV) iodide	364.35	56.9	
I ₄ Ti	Titanium(IV) iodide	377	58.4	
Kr	Krypton	-153.22	9.08	