

# Thermodynamic Properties of Some Gaseous Alkali Halides

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BECAUSE OF RECENT interest in thermodynamic properties of gaseous alkali halides (2-4, 6, 7, 9-11) it seemed worthwhile to re-evaluate these thermodynamic functions over a wider range of temperatures than previously reported. The thermodynamic functions have been computed on an IBM 709 electronic computer for several alkali halides from 10° to 6000° K. The equations were based on the Pennington and Kobe (8) treatment for diatomic molecules. Therefore, these tables include first-order corrections to the harmonic oscillator-rigid rotator approximation.

The calorie used in the calculations is the thermochemical calorie, defined as 4.1840 absolute joules. Other constants used are those given by Cohen (1). The ice point, 0° C., is taken as 273.15° K. The chemical atomic weights were obtained from the values listed by Wichers (12). The effects due to isotopic mixing and nuclear spin are omitted. The molecular constants are listed in Table I. The electronic configuration of the ground state of each alkali halide is a singlet  $^1\Sigma$ . The thermodynamic functions,  $-(F_T^0 - H_T^0)/T$ ,  $(H_T^0 - H_0^0)$ ,  $S_T^0$ , and  $C_p^0$ , for several gaseous alkali halides at temperatures between 10° to 6000° K. are tabulated in Tables II to XII.

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Table I. Molecular Constants Used in Calculating Thermodynamic Functions

Compd.	$B_e$ , Cm. $^{-1}$	$a_e \times 10^4$ Cm. $^{-1}$	$w_e$ , Cm. $^{-1}$	$X_e w_e$ , Cm. $^{-1}$	Ref.
LiF	1.4221	150	900	7.0	(5)
LiCl	0.7103	62	650	4.3	(5)
LiBr	0.5548	56.99	576	4.28	(9)
LiI	0.4432	41.15	501	3.35	(9)
NaCl	0.2181	16.10	366	2.05	(9)
NaBr	0.1495	9.394	302	1.50	(9)
NaI	0.1177	6.480	258	1.08	(9)
KCl	0.1285	7.893	281	1.30	(9)
KBr	0.08117	4.045	213	0.80	(9)
RbCl	0.08764	4.536	228	0.92	(9)
CsCl	0.07204	3.362	209	0.75	(9)

Table II. Thermodynamic Properties of Lithium Fluoride

Temp., ° K.	$-(F_T^0 - H_T^0)$		$S_T^0$ , Cal. per Mole ° K.	$C_p^0$ , Cal. per Mole ° K.
	$T$ , Cal. per Mole ° K.	$H_T^0 - H_0^0$ , Kcal. per Mole		
10	17.025	0.070	23.980	6.955
20	21.846	0.139	28.801	6.955
30	24.666	0.209	31.621	6.955
40	26.667	0.278	33.622	6.955
50	28.220	0.348	35.176	6.957
60	29.488	0.417	36.445	6.958
70	30.561	0.487	37.517	6.958
80	31.490	0.557	38.447	6.959
90	32.309	0.626	39.266	6.959
100	33.042	0.696	39.999	6.960
110	33.705	0.765	40.663	6.962
120	34.311	0.835	41.269	6.966
130	34.868	0.905	41.827	6.971
140	35.383	0.974	42.343	6.979
150	35.864	1.044	42.825	6.991
160	36.313	1.114	43.277	7.006
170	36.735	1.184	43.702	7.025
180	37.134	1.255	44.104	7.047
190	37.511	1.325	44.486	7.073
200	37.868	1.396	44.850	7.103
225	38.692	1.575	45.691	7.189
250	39.430	1.756	46.454	7.288
298.15	40.672	2.112	47.755	7.494
300	40.716	2.126	47.801	7.502
400	42.775	2.896	50.015	7.894
500	44.408	3.701	51.810	8.189
600	45.771	4.531	53.323	8.398
700	46.945	5.379	54.629	8.548
800	47.979	6.239	55.778	8.659
900	48.904	7.110	56.803	8.743
1000	49.741	7.987	57.728	8.809
1100	50.506	8.871	58.570	8.862
1200	51.210	9.759	59.343	8.906
1300	51.864	10.652	60.057	8.944
1400	52.473	11.548	60.721	8.977
1500	53.044	12.447	61.342	9.005
1600	53.581	13.349	61.924	9.031
1700	54.088	14.253	62.472	9.055
1800	54.568	15.160	62.990	9.077
1900	55.024	16.069	63.482	9.097
2000	55.459	16.979	63.949	9.117
2100	55.874	17.892	64.394	9.135
2200	56.271	18.806	64.819	9.152
2300	56.652	19.723	65.227	9.169
2400	57.017	20.640	65.617	9.185
2500	57.369	21.560	65.992	9.201
2600	57.707	22.480	66.354	9.217
2700	58.034	23.403	66.702	9.232
2800	58.350	24.327	67.038	9.246
2900	58.655	25.252	67.362	9.261
3000	58.950	26.179	67.677	9.275
3200	59.515	28.037	68.276	9.303
3400	60.047	29.900	68.841	9.330
3600	60.550	31.769	69.375	9.357
3800	61.028	33.643	69.882	9.383
4000	61.483	35.522	70.364	9.409
4200	61.917	37.406	70.823	9.435
4400	62.332	39.296	71.263	9.461
4600	62.729	41.191	71.684	9.486
4800	63.111	43.090	72.088	9.511
5000	63.478	44.995	72.477	9.536
5200	63.831	46.905	72.851	9.561
5400	64.172	48.820	73.213	9.586
5600	64.501	50.739	73.562	9.611
5800	64.820	52.664	73.900	9.636
6000	65.128	54.594	74.227	9.661

Table III. Thermodynamic Properties of Lithium Chloride

Temp., ° K.	$-(F_T^0 - H_T^0)$			
	$T$ Cal. per Mole ° K.	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ Cal. per Mole ° K.	$C_p^0$ , Cal. per Mole ° K.
10	19.867	0.070	26.822	6.955
20	24.688	0.139	31.643	6.955
30	27.508	0.209	34.464	6.955
40	29.510	0.278	36.466	6.957
50	31.062	0.348	38.018	6.957
60	32.330	0.417	39.287	6.958
70	33.403	0.487	40.359	6.959
80	34.332	0.557	41.289	6.961
90	35.151	0.626	42.109	6.966
100	35.884	0.696	42.843	6.976
110	36.548	0.766	43.509	6.992
120	37.154	0.836	44.118	7.014
130	37.711	0.906	44.681	7.044
140	38.228	0.977	45.204	7.080
150	38.709	1.048	45.694	7.123
160	39.161	1.119	46.155	7.171
170	39.585	1.191	46.592	7.224
180	39.986	1.264	47.006	7.279
190	40.366	1.337	47.401	7.337
200	40.727	1.410	47.779	7.395
225	41.560	1.597	48.658	7.543
250	42.311	1.787	49.461	7.684
298.15	43.579	2.163	50.835	7.927
300	43.624	2.178	50.884	7.935
400	45.743	2.991	53.221	8.296
500	47.432	3.833	55.098	8.520
600	48.844	4.693	56.665	8.666
700	50.060	5.564	58.009	8.765
800	51.128	6.445	59.184	8.838
900	52.083	7.331	60.229	8.893
1000	52.945	8.223	61.168	8.937
1100	53.732	9.118	62.021	8.973
1200	54.456	10.017	62.803	9.004
1300	55.126	10.919	63.525	9.031
1400	55.750	11.824	64.195	9.056
1500	56.334	12.730	64.821	9.078
1600	56.883	13.639	65.408	9.099
1700	57.401	14.550	65.960	9.118
1800	57.891	15.463	66.482	9.137
1900	58.356	16.377	66.976	9.155
2000	58.799	17.294	67.446	9.172
2100	59.222	18.212	67.894	9.188
2200	59.626	19.131	68.322	9.204
2300	60.013	20.052	68.731	9.220
2400	60.384	20.975	69.124	9.235
2500	60.741	21.900	69.501	9.251
2600	61.085	22.825	69.864	9.266
2700	61.417	23.753	70.214	9.280
2800	61.737	24.681	70.552	9.295
2900	62.047	25.612	70.879	9.309
3000	62.347	26.543	71.194	9.324
3200	62.919	28.411	71.797	9.352
3400	63.458	30.284	72.365	9.380
3600	63.968	32.163	72.902	9.408
3800	64.451	34.047	73.411	9.436
4000	64.912	35.937	73.896	9.463
4200	65.350	37.833	74.358	9.490
4400	65.770	39.733	74.800	9.518
4600	66.172	41.640	75.224	9.545
4800	66.558	43.551	75.631	9.572
5000	66.928	45.468	76.022	9.599
5200	67.286	47.391	76.399	9.626
5400	67.630	49.319	76.763	9.653
5600	67.962	51.252	77.114	9.679
5800	68.284	53.190	77.455	9.706
6000	68.595	55.134	77.784	9.733

Table IV. Thermodynamic Properties of Lithium Bromide

Temp., ° K.	$-(F_T^0 - H_T^0)$			
	$T$ Cal. per Mole ° K.	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ Cal. per Mole ° K.	$C_p^0$ Cal. per Mole ° K.
10	22.497	0.070	29.453	6.955
20	27.318	0.139	34.274	6.955
30	30.139	0.209	37.095	6.956
40	32.140	0.278	39.096	6.957
50	33.692	0.348	40.649	6.957
60	34.961	0.417	41.917	6.958
70	36.033	0.487	42.990	6.960
80	36.962	0.557	43.920	6.966
90	37.782	0.626	44.741	6.978
100	38.515	0.696	45.477	6.997
110	39.179	0.766	46.145	7.026
120	39.785	0.837	46.758	7.063
130	40.344	0.908	47.325	7.109
140	40.861	0.979	47.854	7.162
150	41.344	1.051	48.350	7.221
160	41.797	1.123	48.818	7.284
170	42.223	1.197	49.262	7.349
180	42.626	1.270	49.683	7.416
190	43.008	1.345	50.086	7.483
200	43.372	1.420	50.472	7.549
225	44.211	1.611	51.370	7.708
250	44.969	1.805	52.190	7.854
298.15	46.251	2.189	53.594	8.090
300	46.297	2.204	53.644	8.098
400	48.443	3.032	56.024	8.429
500	50.156	3.886	57.927	8.626
600	51.587	4.755	59.512	8.752
700	52.818	5.635	60.868	8.839
800	53.900	6.522	62.053	8.903
900	54.866	7.415	63.104	8.953
1000	55.737	8.312	64.050	8.993
1100	56.533	9.213	64.909	9.028
1200	57.264	10.118	65.695	9.058
1300	57.941	11.025	66.422	9.085
1400	58.571	11.935	67.096	9.110
1500	59.160	12.847	67.725	9.133
1600	59.714	13.761	68.315	9.155
1700	60.237	14.678	68.871	9.176
1800	60.731	15.596	69.396	9.196
1900	61.200	16.517	69.894	9.216
2000	61.647	17.440	70.367	9.235
2100	62.073	18.364	70.818	9.254
2200	62.480	19.290	71.249	9.272
2300	62.871	20.218	71.661	9.290
2400	63.245	21.148	72.057	9.308
2500	63.605	22.080	72.437	9.325
2600	63.952	23.013	72.803	9.342
2700	64.287	23.948	73.156	9.360
2800	64.609	24.885	73.497	9.377
2900	64.922	25.824	73.826	9.394
3000	65.224	26.764	74.145	9.411
3200	65.801	28.649	74.754	9.444
3400	66.344	30.542	75.327	9.478
3600	66.859	32.440	75.870	9.511
3800	67.346	34.346	76.385	9.544
4000	67.811	36.258	76.875	9.576
4200	68.254	38.176	77.343	9.609
4400	68.677	40.101	77.791	9.642
4600	69.083	42.033	78.220	9.674
4800	69.472	43.971	78.633	9.707
5000	69.847	45.916	79.030	9.739
5200	70.207	47.867	79.412	9.771
5400	70.555	49.824	79.782	9.804
5600	70.891	51.788	80.139	9.836
5800	71.216	53.759	80.484	9.868
6000	71.530	55.736	80.820	9.901

Table V. Thermodynamic Properties of Lithium Iodide

Temp., ° K.	$-(F_T^0 - H_T^0)$	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ , Cal. per Mole ° K.	$C_P^0$ , Cal. per Mole ° K.
	$T$ Cal. per Mole ° K.			
10	24.232	0.070	31.187	6.955
20	29.053	0.139	36.008	6.955
30	31.874	0.209	38.830	6.957
40	33.875	0.278	40.831	6.957
50	35.427	0.348	42.384	6.958
60	36.696	0.417	43.652	6.960
70	37.768	0.487	44.725	6.966
80	38.697	0.557	45.657	6.980
90	39.517	0.627	46.480	7.005
100	40.251	0.697	47.220	7.042
110	40.915	0.768	47.893	7.091
120	41.523	0.839	48.513	7.149
130	42.083	0.911	49.087	7.216
140	42.603	0.983	49.625	7.287
150	43.088	1.056	50.130	7.363
160	43.543	1.130	50.608	7.439
170	43.972	1.205	51.061	7.516
180	44.378	1.281	51.493	7.591
190	44.763	1.357	51.905	7.664
200	45.131	1.434	52.300	7.734
225	45.979	1.629	53.221	7.897
250	46.746	1.829	54.060	8.038
298.15	48.046	2.221	55.495	8.256
300	48.092	2.236	55.547	8.263
400	50.271	3.078	57.967	8.551
500	52.009	3.942	59.894	8.716
600	53.461	4.820	61.493	8.821
700	54.708	5.706	62.859	8.893
800	55.803	6.598	64.050	8.947
900	56.779	7.495	65.106	8.990
1000	57.660	8.395	66.056	9.025
1100	58.463	9.300	66.917	9.056
1200	59.201	10.207	67.706	9.084
1300	59.884	11.116	68.435	9.109
1400	60.519	12.028	69.110	9.132
1500	61.113	12.943	69.741	9.155
1600	61.671	13.859	70.333	9.176
1700	62.197	14.778	70.890	9.196
1800	62.695	15.698	71.416	9.216
1900	63.167	16.621	71.915	9.235
2000	63.616	17.545	72.389	9.254
2100	64.045	18.472	72.841	9.273
2200	64.454	19.400	73.273	9.291
2300	64.847	20.330	73.686	9.309
2400	65.224	21.262	74.083	9.327
2500	65.586	22.196	74.464	9.345
2600	65.934	23.131	74.831	9.363
2700	66.270	24.068	75.184	9.380
2800	66.595	25.007	75.526	9.398
2900	66.908	25.948	75.856	9.415
3000	67.212	26.890	76.175	9.433
3200	67.791	28.780	76.785	9.467
3400	68.338	30.677	77.360	9.501
3600	68.854	32.581	77.904	9.535
3800	69.344	34.491	78.421	9.569
4000	69.810	36.408	78.912	9.603
4200	70.255	38.332	79.382	9.637
4400	70.680	40.263	79.831	9.671
4600	71.087	42.201	80.261	9.704
4800	71.478	44.145	80.675	9.738
5000	71.854	46.096	81.073	9.772
5200	72.216	48.053	81.457	9.805
5400	72.565	50.018	81.828	9.839
5600	72.903	51.989	82.186	9.872
5800	73.229	53.967	82.533	9.906
6000	73.545	55.951	82.870	9.939

Table VI. Thermodynamic Properties of Sodium Chloride

Temp., ° K.	$-(F_T^0 - H_T^0)$	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ , Cal. per Mole ° K.	$C_P^0$ , Cal. per Mole ° K.
	$T$ Cal. per Mole ° K.			
10	23.169	0.070	30.125	6.955
20	27.991	0.139	34.947	6.956
30	30.811	0.209	37.767	6.956
40	32.812	0.278	39.768	6.958
50	34.365	0.348	41.321	6.964
60	35.633	0.418	42.593	6.983
70	36.706	0.488	43.672	7.023
80	37.637	0.558	44.613	7.085
90	38.460	0.629	45.452	7.166
100	39.197	0.701	46.212	7.260
110	39.867	0.775	46.909	7.362
120	40.481	0.849	47.554	7.466
130	41.049	0.924	48.155	7.569
140	41.577	1.000	48.720	7.668
150	42.071	1.077	49.252	7.763
160	42.536	1.155	49.756	7.851
170	42.975	1.234	50.235	7.933
180	43.391	1.314	50.690	8.009
190	43.786	1.394	51.125	8.079
200	44.164	1.476	51.541	8.143
225	45.038	1.681	52.509	8.281
250	45.830	1.889	53.387	8.393
298.15	47.174	2.298	54.880	8.552
300	47.222	2.313	54.933	8.557
400	49.475	3.180	57.424	8.751
500	51.268	4.061	59.390	8.858
600	52.761	4.950	61.011	8.927
700	54.040	5.846	62.391	8.977
800	55.161	6.745	63.593	9.015
900	56.158	7.648	64.656	9.048
1000	57.056	8.555	65.611	9.076
1100	57.874	9.464	66.477	9.102
1200	58.625	10.375	67.270	9.125
1300	59.318	11.289	68.002	9.148
1400	59.963	12.204	68.680	9.169
1500	60.565	13.122	69.314	9.190
1600	61.131	14.042	69.907	9.210
1700	61.664	14.965	70.466	9.230
1800	62.168	15.889	70.995	9.250
1900	62.645	16.814	71.495	9.269
2000	63.100	17.742	71.971	9.288
2100	63.533	18.672	72.425	9.307
2200	63.947	19.604	72.858	9.326
2300	64.344	20.537	73.273	9.345
2400	64.724	21.473	73.671	9.363
2500	65.090	22.410	74.054	9.382
2600	65.442	23.349	74.422	9.400
2700	65.781	24.290	74.777	9.418
2800	66.108	25.233	75.120	9.437
2900	66.425	26.177	75.452	9.455
3000	66.731	27.124	75.772	9.473
3200	67.316	29.022	76.385	9.509
3400	67.866	30.927	76.963	9.546
3600	68.387	32.840	77.509	9.582
3800	68.881	34.760	78.028	9.618
4000	69.351	36.687	78.522	9.654
4200	69.799	38.622	78.994	9.690
4400	70.227	40.563	79.446	9.726
4600	70.637	42.512	79.879	9.762
4800	71.031	44.468	80.295	9.798
5000	71.410	46.431	80.696	9.833
5200	71.774	48.401	81.082	9.869
5400	72.126	50.379	81.455	9.905
5600	72.466	52.363	81.816	9.941
5800	72.794	54.355	82.166	9.977
6000	73.112	56.354	82.505	10.012

Table VII. Thermodynamic Properties of Sodium Bromide

Temp., ° K.	$-(F_T^\circ - H_T^\circ)$	$H_T^\circ - H_0^\circ$	$S_T^\circ$	$C_p^\circ$
	Cal. per Mole ° K.	Kcal. per Mole	Cal. per Mole ° K.	Cal. per Mole ° K.
10	25.605	0.070	32.560	6.955
20	30.426	0.139	37.382	6.956
30	33.247	0.209	40.203	6.957
40	35.248	0.278	42.204	6.962
50	36.800	0.348	43.760	6.984
60	38.070	0.418	45.037	7.037
70	39.145	0.489	46.128	7.121
80	40.079	0.561	47.086	7.228
90	40.906	0.633	47.944	7.349
100	41.649	0.708	48.725	7.475
110	42.326	0.783	49.443	7.599
120	42.947	0.859	50.109	7.716
130	43.522	0.937	50.731	7.826
140	44.058	1.016	51.315	7.926
150	44.560	1.096	51.865	8.017
160	45.033	1.176	52.385	8.100
170	45.480	1.258	52.878	8.174
180	45.904	1.340	53.348	8.241
190	46.308	1.422	53.795	8.301
200	46.693	1.506	54.222	8.355
225	47.586	1.716	55.213	8.469
250	48.394	1.929	56.110	8.558
298.15	49.766	2.344	57.629	8.682
300	49.815	2.360	57.682	8.686
400	52.111	3.237	60.204	8.833
500	53.935	4.125	62.184	8.916
600	55.450	5.019	63.815	8.970
700	56.746	5.918	65.201	9.011
800	57.880	6.821	66.406	9.044
900	58.888	7.727	67.473	9.073
1000	59.795	8.636	68.431	9.098
1100	60.620	9.547	69.299	9.122
1200	61.377	10.460	70.094	9.145
1300	62.076	11.376	70.826	9.167
1400	62.726	12.293	71.507	9.188
1500	63.332	13.213	72.141	9.209
1600	63.902	14.135	72.736	9.229
1700	64.438	15.059	73.296	9.249
1800	64.945	15.985	73.826	9.269
1900	65.426	16.913	74.327	9.289
2000	65.883	17.843	74.804	9.308
2100	66.319	18.774	75.259	9.328
2200	66.735	19.708	75.693	9.347
2300	67.133	20.644	76.109	9.366
2400	67.516	21.581	76.508	9.385
2500	67.883	22.521	76.892	9.404
2600	68.237	23.462	77.261	9.423
2700	68.578	24.406	77.617	9.442
2800	68.907	25.351	77.960	9.461
2900	69.225	26.298	78.293	9.480
3000	69.532	27.247	78.615	9.499
3200	70.119	29.150	79.229	9.537
3400	70.672	31.061	79.808	9.575
3600	71.195	32.980	80.356	9.612
3800	71.691	34.906	80.877	9.650
4000	72.163	36.840	81.373	9.687
4200	72.613	38.781	81.847	9.725
4400	73.043	40.730	82.300	9.762
4600	73.455	42.686	82.735	9.800
4800	73.850	44.650	83.152	9.837
5000	74.231	46.621	83.555	9.875
5200	74.597	48.600	83.943	9.912
5400	74.950	50.586	84.318	9.949
5600	75.291	52.579	84.680	9.987
5800	75.621	54.581	85.031	10.024
6000	75.940	56.589	85.372	10.062

Table VIII. Thermodynamic Properties of Sodium Iodide

Temp., ° K.	$-(F_T^\circ - H_T^\circ)$	$H_T^\circ - H_0^\circ$	$S_T^\circ$	$C_p^\circ$
	Cal. per Mole ° K.	Kcal. per Mole	Cal. per Mole ° K.	Cal. per Mole ° K.
10	27.201	0.070	34.156	6.955
20	32.022	0.139	38.978	6.956
30	34.843	0.209	41.799	6.958
40	36.844	0.278	43.802	6.974
50	38.397	0.348	45.363	7.026
60	39.669	0.419	46.652	7.121
70	40.747	0.491	47.759	7.249
80	41.686	0.564	48.736	7.392
90	42.519	0.639	49.615	7.539
100	43.269	0.715	50.417	7.679
110	43.953	0.792	51.155	7.809
120	44.582	0.871	51.840	7.927
130	45.165	0.951	52.478	8.032
140	45.709	1.032	53.077	8.125
150	46.219	1.113	53.640	8.207
160	46.700	1.196	54.172	8.280
170	47.154	1.279	54.676	8.345
180	47.586	1.363	55.155	8.402
190	47.996	1.447	55.611	8.452
200	48.388	1.532	56.045	8.498
225	49.296	1.745	57.052	8.591
250	50.117	1.961	57.961	8.663
298.15	51.511	2.381	59.496	8.762
300	51.561	2.397	59.550	8.765
400	53.890	3.280	62.089	8.882
500	55.736	4.172	64.079	8.949
600	57.267	5.069	65.715	8.994
700	58.575	5.970	67.104	9.029
800	59.719	6.874	68.312	9.059
900	60.734	7.782	69.380	9.085
1000	61.647	8.691	70.339	9.109
1100	62.478	9.604	71.208	9.132
1200	63.239	10.518	72.004	9.154
1300	63.942	11.434	72.737	9.175
1400	64.594	12.353	73.418	9.196
1500	65.204	13.274	74.053	9.217
1600	65.776	14.196	74.649	9.237
1700	66.314	15.121	75.209	9.257
1800	66.823	16.048	75.739	9.277
1900	67.306	16.976	76.241	9.296
2000	67.765	17.907	76.718	9.316
2100	68.202	18.839	77.173	9.335
2200	68.620	19.774	77.608	9.355
2300	69.020	20.710	78.024	9.374
2400	69.403	21.649	78.424	9.393
2500	69.772	22.589	78.807	9.413
2600	70.126	23.531	79.177	9.432
2700	70.468	24.475	79.533	9.451
2800	70.798	25.422	79.877	9.470
2900	71.117	26.370	80.210	9.489
3000	71.426	27.319	80.532	9.508
3200	72.014	29.225	81.147	9.547
3400	72.569	31.138	81.727	9.585
3600	73.093	33.059	82.276	9.623
3800	73.590	34.987	82.797	9.661
4000	74.063	36.923	83.294	9.699
4200	74.514	38.867	83.768	9.737
4400	74.945	40.818	84.222	9.775
4600	75.358	42.777	84.657	9.813
4800	75.754	44.743	85.075	9.851
5000	76.135	46.717	85.478	9.889
5200	76.502	48.699	85.867	9.927
5400	76.856	50.688	86.242	9.965
5600	77.197	52.685	86.605	10.003
5800	77.528	54.689	86.957	10.041
6000	77.848	56.701	87.298	10.079

Table IX. Thermodynamic Properties of Potassium Chloride

Temp., ° K.	$-(F_T^0 - H_T^0)$			
	$T$ Cal. per Mole ° K.	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ , Cal. per Mole ° K.	$C_T^0$ , Cal. per Mole ° K.
10	24.945	0.070	31.900	6.955
20	29.766	0.139	36.722	6.956
30	32.586	0.209	39.542	6.957
40	34.588	0.278	41.545	6.966
50	36.140	0.348	43.102	7.000
60	37.411	0.418	44.384	7.070
70	38.487	0.490	45.481	7.174
80	39.423	0.562	46.447	7.299
90	40.252	0.636	47.314	7.433
100	40.998	0.711	48.104	7.567
110	41.678	0.787	48.832	7.695
120	42.303	0.864	49.506	7.813
130	42.881	0.943	50.136	7.922
140	43.421	1.023	50.727	8.020
150	43.927	1.104	51.283	8.107
160	44.403	1.185	51.809	8.186
170	44.853	1.267	52.307	8.256
180	45.281	1.350	52.781	8.318
190	45.687	1.434	53.232	8.374
200	46.076	1.518	53.663	8.424
225	46.975	1.729	54.662	8.528
250	47.790	1.944	55.565	8.609
298.15	49.172	2.361	57.091	8.721
300	49.221	2.377	57.145	8.725
400	51.533	3.257	59.675	8.858
500	53.367	4.147	61.661	8.933
600	54.889	5.043	63.294	8.983
700	56.191	5.943	64.682	9.021
800	57.330	6.847	65.888	9.052
900	58.341	7.754	66.956	9.080
1000	59.251	8.663	67.914	9.105
1100	60.079	9.574	68.783	9.129
1200	60.838	10.488	69.578	9.151
1300	61.539	11.405	70.312	9.173
1400	62.190	12.323	70.992	9.194
1500	62.798	13.243	71.627	9.215
1600	63.369	14.166	72.223	9.235
1700	63.906	15.090	72.783	9.255
1800	64.414	16.017	73.313	9.275
1900	64.896	16.945	73.815	9.295
2000	65.354	17.876	74.292	9.315
2100	65.791	18.808	74.747	9.334
2200	66.208	19.743	75.182	9.354
2300	66.607	20.679	75.598	9.373
2400	66.990	21.617	75.997	9.392
2500	67.358	22.558	76.381	9.412
2600	67.712	23.500	76.750	9.431
2700	68.054	24.444	77.107	9.450
2800	68.383	25.390	77.451	9.469
2900	68.701	26.338	77.783	9.488
3000	69.010	27.287	78.105	9.508
3200	69.597	29.193	78.720	9.546
3400	70.151	31.106	79.300	9.584
3600	70.675	33.026	79.849	9.622
3800	71.172	34.954	80.370	9.660
4000	71.644	36.890	80.867	9.698
4200	72.095	38.834	81.341	9.736
4400	72.525	40.785	81.795	9.774
4600	72.938	42.743	82.230	9.812
4800	73.334	44.710	82.648	9.850
5000	73.714	46.683	83.051	9.888
5200	74.081	48.665	83.440	9.926
5400	74.435	50.654	83.815	9.964
5600	74.776	52.650	84.178	10.002
5800	75.107	54.655	84.530	10.040
6000	75.426	56.666	84.871	10.078

Table X. Thermodynamic Properties of Potassium Bromide

Temp., ° K.	$-(F_T^0 - H_T^0)$			
	$T$ Cal. per Mole ° K.	$H_T^0 - H_0^0$ , Kcal. per Mole	$S_T^0$ , Cal. per Mole ° K.	$C_T^0$ , Cal. per Mole ° K.
10	27.251	0.070	34.206	6.955
20	32.072	0.139	39.028	6.956
30	34.892	0.209	41.849	6.965
40	36.894	0.279	43.858	7.015
50	38.450	0.349	45.434	7.127
60	39.727	0.421	46.747	7.285
70	40.813	0.495	47.883	7.461
80	41.761	0.570	48.891	7.634
90	42.604	0.648	49.800	7.794
100	43.366	0.726	50.628	7.936
110	44.061	0.806	51.391	8.060
120	44.702	0.887	52.097	8.167
130	45.296	0.970	52.754	8.259
140	45.851	1.053	53.369	8.338
150	46.372	1.136	53.947	8.407
160	46.862	1.221	54.491	8.466
170	47.326	1.306	55.006	8.517
180	47.767	1.391	55.494	8.562
190	48.186	1.477	55.958	8.602
200	48.586	1.563	56.401	8.637
225	49.512	1.780	57.422	8.708
250	50.349	1.998	58.343	8.763
298.15	51.769	2.422	59.893	8.837
300	51.819	2.438	59.948	8.840
400	54.186	3.327	62.504	8.930
500	56.057	4.223	64.503	8.983
600	57.605	5.124	66.144	9.022
700	58.927	6.027	67.538	9.054
800	60.081	6.934	68.748	9.081
900	61.104	7.844	69.819	9.107
1000	62.025	8.755	70.780	9.130
1100	62.861	9.670	71.652	9.153
1200	63.627	10.586	72.449	9.176
1300	64.334	11.505	73.184	9.198
1400	64.991	12.426	73.867	9.219
1500	65.604	13.349	74.503	9.241
1600	66.179	14.274	75.101	9.262
1700	66.721	15.201	75.663	9.283
1800	67.233	16.130	76.194	9.304
1900	67.718	17.062	76.697	9.325
2000	68.179	17.995	77.176	9.345
2100	68.618	18.931	77.633	9.366
2200	69.038	19.869	78.069	9.387
2300	69.440	20.809	78.487	9.407
2400	69.825	21.750	78.887	9.428
2500	70.195	22.694	79.273	9.448
2600	70.552	23.640	79.644	9.469
2700	70.895	24.588	80.001	9.489
2800	71.226	25.538	80.347	9.510
2900	71.547	26.490	80.681	9.530
3000	71.857	27.444	81.004	9.551
3200	72.448	29.358	81.622	9.592
3400	73.005	31.280	82.205	9.633
3600	73.531	33.211	82.757	9.673
3800	74.031	35.150	83.281	9.714
4000	74.506	37.097	83.780	9.755
4200	74.959	39.052	84.257	9.796
4400	75.392	41.015	84.714	9.836
4600	75.807	42.986	85.152	9.877
4800	76.205	44.966	85.573	9.918
5000	76.588	46.954	85.979	9.959
5200	76.957	48.949	86.370	9.999
5400	77.312	50.953	86.748	10.040
5600	77.656	52.965	87.114	10.081
5800	77.988	54.986	87.469	10.121
6000	78.310	57.014	87.812	10.162

Table XI. Thermodynamic Properties of Rubidium Chloride

Temp., ° K.	$-(F_T^\circ - H_T^\circ)$	$H_T^\circ - H_0^\circ$ , Kcal. per Mole	$S_T^\circ$ , Cal. per Mole ° K.	$C_p^\circ$ , Cal. per Mole ° K.
	$T$ , Cal. per Mole ° K.			
10	27.146	0.070	34.101	6.955
20	31.968	0.139	38.923	6.956
30	34.788	0.209	41.744	6.961
40	36.790	0.278	43.751	6.996
50	38.344	0.349	45.320	7.084
60	39.618	0.420	46.623	7.219
70	40.701	0.493	47.748	7.380
80	41.645	0.568	48.744	7.545
90	42.485	0.644	49.642	7.703
100	43.242	0.722	50.461	7.846
110	43.933	0.801	51.215	7.974
120	44.569	0.881	51.914	8.085
130	45.160	0.963	52.565	8.183
140	45.711	1.045	53.174	8.267
150	46.227	1.128	53.747	8.341
160	46.714	1.212	54.288	8.405
170	47.175	1.296	54.799	8.461
180	47.612	1.381	55.284	8.510
190	48.028	1.466	55.745	8.554
200	48.425	1.552	56.185	8.592
225	49.345	1.768	57.202	8.671
250	50.177	1.985	58.119	8.731
298.15	51.588	2.408	59.664	8.814
300	51.638	2.424	59.719	8.816
400	53.992	3.311	62.270	8.915
500	55.854	4.206	64.266	8.973
600	57.397	5.105	65.905	9.014
700	58.714	6.008	67.297	9.046
800	59.864	6.914	68.507	9.075
900	60.885	7.823	69.578	9.100
1000	61.803	8.734	70.538	9.124
1100	62.638	9.648	71.409	9.147
1200	63.402	10.564	72.205	9.170
1300	64.108	11.482	72.940	9.192
1400	64.763	12.402	73.622	9.213
1500	65.376	13.325	74.259	9.234
1600	65.950	14.249	74.855	9.255
1700	66.490	15.176	75.417	9.276
1800	67.001	16.104	75.948	9.296
1900	67.485	17.035	76.451	9.317
2000	67.945	17.968	76.929	9.337
2100	68.384	18.902	77.385	9.358
2200	68.803	19.839	77.821	9.378
2300	69.205	20.778	78.238	9.398
2400	69.589	21.719	78.639	9.418
2500	69.959	22.662	79.024	9.439
2600	70.315	23.606	79.394	9.459
2700	70.658	24.553	79.752	9.479
2800	70.989	25.502	80.097	9.499
2900	71.309	26.453	80.430	9.519
3000	71.618	27.406	80.753	9.539
3200	72.209	29.318	81.370	9.579
3400	72.765	31.238	81.952	9.620
3600	73.291	33.166	82.503	9.660
3800	73.789	35.102	83.027	9.700
4000	74.264	37.046	83.525	9.740
4200	74.716	38.998	84.001	9.780
4400	75.149	40.958	84.457	9.820
4600	75.563	42.926	84.895	9.860
4800	75.961	44.902	85.315	9.900
5000	76.343	46.885	85.720	9.940
5200	76.711	48.877	86.111	9.980
5400	77.066	50.877	86.488	10.020
5600	77.409	52.885	86.853	10.060
5800	77.741	54.901	87.207	10.100
6000	78.062	56.925	87.550	10.140

Table XII. Thermodynamic Properties of Cesium Chloride

Temp., ° K.	$-(F_T^\circ - H_T^\circ)$	$H_T^\circ - H_0^\circ$ , Kcal. per Mole	$S_T^\circ$ , Cal. per Mole ° K.	$C_p^\circ$ , Cal. per Mole ° K.
	$T$ , Cal. per Mole ° K.			
10	28.522	0.070	35.477	6.956
20	33.343	0.139	40.299	6.956
30	36.163	0.209	43.120	6.966
40	38.166	0.279	45.130	7.021
50	39.722	0.349	46.709	7.140
60	40.999	0.422	48.024	7.304
70	42.086	0.495	49.164	7.484
80	43.035	0.571	50.175	7.659
90	43.879	0.649	51.086	7.819
100	44.642	0.728	51.917	7.960
110	45.339	0.808	52.682	8.082
120	45.981	0.889	53.390	8.188
130	46.576	0.971	54.049	8.278
140	47.132	1.055	54.665	8.356
150	47.654	1.139	55.244	8.423
160	48.145	1.223	55.789	8.480
170	48.610	1.308	56.305	8.531
180	49.052	1.394	56.794	8.574
190	49.471	1.480	57.259	8.613
200	49.872	1.566	57.701	8.647
225	50.800	1.783	58.724	8.716
250	51.639	2.002	59.645	8.768
298.15	53.061	2.426	61.196	8.841
300	53.111	2.442	61.251	8.843
400	55.480	3.331	63.808	8.930
500	57.353	4.227	65.806	8.981
600	58.903	5.127	67.447	9.018
700	60.225	6.030	68.840	9.049
800	61.379	6.936	70.050	9.075
900	62.403	7.845	71.120	9.099
1000	63.324	8.756	72.080	9.122
1100	64.160	9.670	72.951	9.144
1200	64.926	10.585	73.747	9.166
1300	65.633	11.503	74.482	9.187
1400	66.290	12.422	75.163	9.207
1500	66.903	13.344	75.799	9.228
1600	67.478	14.268	76.395	9.248
1700	68.019	15.194	76.957	9.268
1800	68.531	16.122	77.487	9.288
1900	69.015	17.051	77.990	9.308
2000	69.476	17.983	78.468	9.328
2100	69.915	18.917	78.923	9.348
2200	70.335	19.853	79.359	9.368
2300	70.736	20.791	79.775	9.387
2400	71.121	21.730	80.175	9.407
2500	71.491	22.672	80.560	9.427
2600	71.847	23.616	80.930	9.446
2700	72.190	24.561	81.287	9.466
2800	72.521	25.509	81.631	9.486
2900	72.841	26.458	81.965	9.505
3000	73.150	27.410	82.287	9.525
3200	73.741	29.319	82.903	9.564
3400	74.297	31.235	83.484	9.603
3600	74.823	33.160	84.034	9.642
3800	75.322	35.092	84.556	9.681
4000	75.796	37.032	85.054	9.720
4200	76.248	38.980	85.529	9.759
4400	76.680	40.936	85.984	9.798
4600	77.094	42.899	86.420	9.837
4800	77.492	44.871	86.840	9.876
5000	77.874	46.850	87.244	9.915
5200	78.242	48.837	87.633	9.954
5400	78.597	50.831	88.010	9.993
5600	78.939	52.834	88.374	10.032
5800	79.271	54.844	88.727	10.071
6000	79.592	56.862	89.069	10.110