

Pressure-Density-Temperature Relations of Fluid Para Hydrogen From 15 to 100 °K at Pressures to 350 Atmospheres*

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Experimental data are presented at closely spaced intervals of temperature and density. The range of experimental densities is from 0.064 to 2.8 times the critical density. There are presented, in addition, tables interpolated uniformly in arguments density and temperature, and also in pressure and temperature.

1. Introduction

Very few data exist on the compressibility (PVT) behavior of 20 °K-equilibrium (i.e., “para”) hydrogen in compressed liquid and dense fluid states [1–5].¹ The low-density PVT differences between normal and para hydrogen are known to be small in the neighborhood of 20 °K [6].

The purpose of this report is to place on record our experimental PVT observations on para hydrogen at high densities, together with useful interpolations to uniform values of all variables. Experimental second and third virial coefficients were reported in the apparatus publication supporting the present results [7]. Smoothing and representation of the temperature-dependence of these coefficients is in progress.

Data of this report are the basis for several related properties of para hydrogen. The observed vapor pressures have been represented analytically and compared with earlier data [8]. The derived orthobaric liquid-vapor densities have been reported [9, 10]. An empirical representation of the pressure-temperature relation at melting [11] has been used to obtain densities of liquid at freezing [12]. An equation of state, adjusted to the present PVT data, has been used to obtain a provisional set of thermodynamic functions [13]. These functions have been extended by others to lower temperatures and pressures [14].

2. Symbols, Dimensions and Constants

The term “parahydrogen” is employed for brevity here to mean 20 °K-equilibrium hydrogen [1]. Confirmation of para hydrogen in the piezometer has been described [7].

Pressures, P , are in standard atmospheres [17]. Temperatures, T , are on the NBS 1955 low-temperature scale, obtained by subtracting 0.01 °C from temperatures on the NBS 1939 scale of Hoge and Brickwedde [16]. Densities, ρ , are in gram moles per cubic centimeter. These derive from use of the gas constant, R , in conjunction with experimental quantities. Determination of the amount of sample as gas at normal conditions is based upon compressibility data of normal hydrogen with $R=82.057$ cm³ atm/g mol deg [7, 15]. Representations of isotherms of $(Pv-RT)v$ are based upon $R=82.0597$ cm³ atm/g mol deg, corresponding to the recent international temperature scale [17].

The largest experimental errors occur in density. Accuracy and precision in this variable have been estimated at 0.1 and 0.02 percent respectively [7].

3. Data Tables

Experimental data in table 1 result from the laboratory observations and computer program described for computation of apparatus adjustments [7]. They are arranged in the sequence of increasing densities, except as noted below. Each set of four columns represents an experimental “run” of increasing temperature at nearly constant density. Each run is identified by the first two digits in the fourth column.

The slight decrease of density with increasing pressure in each run is due to expulsion of fluid from the piezometer into the pressure gage diaphragm cell. Since temperatures are reproduced accurately from run to run, these data yield isotherms. Absence of an entry for density indicates that two phases coexist.

The last three runs in table 1 give closely spaced vapor pressures and densities in the critical region.

Table 2 presents the PVT data interpolated to isochores, that is to uniform densities at the experimental temperatures. Table entries are pressures in atmospheres.

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¹ Figures in brackets indicate the literature references at the end of this paper

Table 1. Temperature-Pressure-Density Observations on Para Hydrogen - Continued

T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.
20	211.053	.0425775	6101	21	241.686	.0430003	6201	21	263.293	.0434403	6301
21	221.489	.0425677	6102	22	252.326	.0429902	6202	22	274.103	.0434307	6302
22	232.026	.0425578	6103	23	263.069	.0429797	6203	23	284.982	.0434207	6303
23	242.665	.0425461	6104	24	273.812	.0429696	6204	24	295.928	.0434096	6304
24	253.306	.0425363	6105	25	284.690	.0429596	6205	25	306.909	.0433992	6305
25	264.015	.0425262	6106	26	295.535	.0429499	6206	26	317.991	.0433897	6306
26	274.757	.0425164	6107	27	306.448	.0429404	6207	27	329.040	.0433806	6307
27	285.534	.0425064	6108	28	317.428	.0429312	6208	28	340.124	.0433715	6308
28	296.311	.0424967	6109	29	328.340	.0429226	6209	29	351.242	.0433624	6309
29	307.155	.0424874	6110	30	339.320	.0429137	6210				
30	317.966	.0424782	6111	31	350.301	.0429046	6211				
31	328.811	.0424691	6112								
32	339.656	.0424598	6113								
33	350.502	.0424511	6114								
T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.
22	293.888	.0438020	6401	22	312.227		6501				
23	304.767	.0437923	6402	23	324.091	.0441553	6502				
24	315.748	.0437820	6403	24	335.208	.0441461	6503				
25	326.762	.0437731	6404	25	346.427	.0441359	6504				
26	337.879	.0437633	6405								
27	348.995	.0437540	6406								
T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.	T, °K	P, atm	ρ , g mol/cc	Ident.
30.0	8.117		9601	30.0	8.117		9701	30.0	8.116		9501
30.5	8.789		9602	30.5	8.789		9702	30.5	8.787		9502
31.0	9.500		9603	31.0	9.500		9703	31.0	9.503		9503
31.5	10.254		9604	31.5	10.254		9704	31.5	10.253		9504
32.0	11.052		9605	32.0	11.052		9705	32.0	11.050		9505
32.5	11.898		9606	32.5	11.899		9706	32.5	11.899		9506
32.6	12.074		9607	32.6	12.075		9707	32.6	12.075		9507
32.7	12.252		9608	32.7	12.254		9708	32.7	12.253		9508
32.8	12.433		9609	32.8	12.435		9709	32.8	12.433		9509
32.9	12.619		9610	32.9	12.618		9710	32.9	12.617		9510
33.0	12.794	.0140986	9611	33.0	12.804	.0155239	9711	33.0	12.807	.0163976	9511
33.1	12.966	.0140983	9612	33.1	12.991	.0155236	9712	33.1	13.003	.0163973	9512
33.2	13.137	.0140981	9613	33.2	13.178	.0155234	9713	33.2	13.200	.0163970	9513
33.3	13.308	.0140979	9614	33.3	13.365	.0155231	9714	33.3	13.397	.0163967	9514
33.4	13.478	.0140977	9615	33.4	13.552	.0155229	9715	33.4	13.596	.0163965	9515
33.5	13.648	.0140974	9616	33.5	13.740	.0155226	9716	33.5	13.795	.0163962	9516
34.0	14.497	.0140963	9617	34.0	14.683	.0155213	9717	34.0	14.799	.0163948	9517
35.0	16.194	.0140940	9618	35.0	16.583	.0155188	9718	35.0	16.832	.0163921	9518
36.0	17.892	.0140917	9619	36.0	18.498	.0155162	9719	36.0	18.886	.0163893	9519
37.0	19.593	.0140894	9620	37.0	20.422	.0155136	9720	37.0	20.955	.0163866	9520
38.0	21.294	.0140871	9621	38.0	22.353	.0155110	9721	38.0	23.035	.0163837	9521
39.0	22.997	.0140848	9622	39.0	24.289	.0155084	9722	39.0	25.123	.0163809	9522
40.0	24.699	.0140826	9623	40.0	26.228	.0155058	9723	40.0	27.216	.0163782	9523

Experimental isotherm functions $(P_V - RT)_V$, where v is molal volume, were represented by polynomial expansions in density [18], using least-squares methods [19] and an electronic computer with eleven digits. The number of terms in each polynomial was selected by trial as the minimum number required to give deviations within experimental precision [7]. This number increases from five terms at 100 °K to fifteen terms at 33 °K. From 32 through 24 °K, data for both vapor and compressed liquid were represented simultaneously by single isotherm polynomials of nine terms. From 23 through 17 °K, data for the compressed liquid were represented with six terms.

Differences between experimental and calculated

results were averaged for each run and converted to an assumed error in experimental determination of density (amount of sample) for that run. Fixed adjustments to the density throughout certain runs were applied for smoothing, as given in table 2A. These are within the experimental precision. A final set of polynomial representations of isotherms, obtained as above, then represents all pressures within the experimental precision. The first derivatives of pressure with respect to density, obtained from these polynomials, are smooth; the second derivatives are smooth and monotonically increasing. These representations were used to calculate pressures at the uniform densities in table 2. Some entries in table 2 are extrapolated beyond the maximum experimental pressure of 350 atm.

Table 2. Pressures in Atmospheres at Integral Densities and Temperatures

DENSITY MOL/CC	TEMPERATURE DEGREES K												
	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000
.0005								.929	.972	1.014	1.056	1.098	1.140
.0010								1.750	1.836	1.923	2.009	2.095	2.181
.0015								2.462	2.597	2.730	2.863	2.996	3.127
.0020										3.438	3.620	3.801	3.981
.0025											4.283	4.515	4.745
.0030												5.139	5.422
.0035												5.677	6.015
.0040													6.526
.0285													8.317
.0290													10.400
.0295												6.950	12.833
.0300												9.543	15.645
.0305											6.210	12.545	18.867
.0310											9.444	15.988	22.531
.0315										6.349	13.145	19.905	26.667
.0320									3.327	10.337	17.349	24.327	31.309
.0325									7.625	14.861	22.088	29.288	36.489
.0330								5.059	12.500	19.956	27.398	34.820	42.240
.0335							2.688	10.320	17.986	25.658	33.314	40.959	48.596
.0340							8.364	16.232	24.118	32.001	39.870	47.738	55.592
.0345						6.732	14.743	22.830	30.929	39.021	47.102	55.191	63.262
.0350					5.379	13.615	21.851	30.146	38.454	46.754	55.047	63.355	71.641
.0355				4.452	12.799	21.250	29.719	38.217	46.730	55.237	63.741	72.264	80.764
.0360			3.880	12.456	21.026	29.678	38.378	47.076	55.791	64.505	73.219	81.954	90.668
.0365		3.784	12.501	21.285	30.094	38.942	47.862	56.761	65.675	74.596	83.519	92.463	101.389
.0370	4.207	13.087	22.027	30.998	40.038	49.081	58.207	67.306	76.418	85.546	94.679	103.827	112.964
.0375	14.275	23.360	32.491	41.642	50.895	60.134	69.451	78.751	88.060	97.394	106.734	116.084	125.430
.0380	25.354	34.619	43.927	53.261	62.703	72.138	81.635	91.133	100.639	110.177	119.724	129.273	138.825
.0385	37.468	46.885	56.368	65.888	75.499	85.130	94.797	104.492	114.195	123.934	133.685	143.431	153.187
.0390	50.640	60.185	69.848	79.557	89.323	99.146	108.982	118.869	128.768	138.704	148.657	158.599	168.556
.0395	64.891	74.555	84.403	94.294	104.214	114.223	124.230	134.305	144.399	154.527	164.678	174.815	184.970
.0400	80.240	90.036	100.067	110.131	120.212	130.397	140.583	150.843	161.129	171.442	181.787	192.120	202.468
.0405	96.705	106.680	116.878	127.100	137.357	147.707	158.084	168.523	178.998	189.490	200.024	210.554	221.092
.0410		124.549	134.872	145.244	155.688	166.193	176.772	187.389	198.046	208.711	219.429	230.156	240.879
.0415			154.088	164.614	175.246	185.898	196.686	207.477	218.312	229.146	240.041	250.965	261.870
.0420			174.564	185.280	196.067	206.869	217.860	228.826	239.831	250.835	261.901	273.019	284.103
.0425				207.333	218.189	229.157	240.327	251.465	262.636	273.817	285.050	296.354	307.616
.0430					241.649	252.819	264.111	275.418	286.753	298.132	309.527	321.004	332.443
.0435					266.479	277.921	289.235	300.699	312.202	323.816	335.374	346.996	358.619
.0440						304.534	315.711	327.308	338.994	350.903	362.630	374.358	386.174

Table 2. Pressures in Atmospheres at Integral Densities and Temperatures - Continued

DENSITY MOL/CC	TEMPERATURE DEGREES K												
	30.000	31.000	32.000	33.000	34.000	35.000	36.000	37.000	38.000	39.000	40.000	42.000	44.000
.0005	1.182	1.223	1.265	1.307	1.349	1.391	1.433	1.475	1.517	1.559	1.600	1.684	1.767
.0010	2.267	2.352	2.438	2.524	2.609	2.695	2.780	2.866	2.951	3.036	3.121	3.291	3.461
.0015	3.259	3.390	3.521	3.652	3.783	3.914	4.044	4.175	4.305	4.435	4.565	4.825	5.084
.0020	4.160	4.339	4.518	4.696	4.874	5.051	5.229	5.406	5.583	5.759	5.936	6.288	6.639
.0025	4.975	5.203	5.431	5.658	5.884	6.111	6.336	6.562	6.787	7.011	7.235	7.683	8.129
.0030	5.704	5.984	6.263	6.541	6.818	7.095	7.370	7.645	7.920	8.194	8.468	9.013	9.557
.0035	6.352	6.685	7.017	7.348	7.677	8.006	8.333	8.660	8.986	9.311	9.635	10.282	10.927
.0040	6.920	7.309	7.697	8.083	8.465	8.848	9.229	9.608	9.987	10.364	10.741	11.492	12.240
.0045	7.412	7.859	8.305	8.747	9.186	9.624	10.059	10.493	10.926	11.358	11.788	12.646	13.500
.0050	7.831	8.339	8.844	9.344	9.842	10.336	10.828	11.318	11.807	12.293	12.779	13.747	14.709
.0055		8.751	9.319	9.879	10.436	10.989	11.539	12.086	12.632	13.175	13.718	14.798	15.872
.0060		9.101	9.732	10.354	10.972	11.584	12.194	12.801	13.404	14.006	14.607	15.801	16.990
.0065		9.392	10.087	10.773	11.454	12.127	12.797	13.464	14.128	14.789	15.449	16.761	18.066
.0070			10.388	11.140	11.884	12.620	13.352	14.081	14.805	15.527	16.248	17.680	19.105
.0075			10.638	11.458	12.266	13.066	13.862	14.653	15.440	16.224	17.006	18.561	20.108
.0080			10.842	11.730	12.605	13.470	14.330	15.185	16.035	16.882	17.727	19.407	21.080
.0085			11.003	11.961	12.903	13.834	14.759	15.679	16.593	17.505	18.414	20.221	22.022
.0090				12.155	13.164	14.162	15.153	16.138	17.119	18.096	19.070	21.006	22.938
.0095				12.314	13.392	14.458	15.516	16.567	17.615	18.658	19.698	21.767	23.832
.0100				12.442	13.590	14.725	15.850	16.969	18.083	19.194	20.301	22.505	24.706
.0105				12.544	13.762	14.966	16.159	17.345	18.528	19.708	20.883	23.225	25.564
.0110				12.622	13.912	15.184	16.445	17.700	18.953	20.202	21.446	23.928	26.409
.0115				12.681	14.041	15.382	16.712	18.037	19.359	20.679	21.995	24.620	27.244
.0120				12.724	14.154	15.564	16.963	18.358	19.752	21.143	22.531	25.303	28.073
.0125				12.754	14.252	15.731	17.200	18.666	20.132	21.596	23.058	25.979	28.900
.0130				12.775	14.339	15.886	17.427	18.965	20.504	22.042	23.580	26.654	29.727
.0135				12.787	14.417	16.033	17.645	19.256	20.871	22.485	24.099	27.329	30.559
.0140				12.795	14.488	16.172	17.858	19.544	21.235	22.926	24.619	28.010	31.400
.0145				12.799	14.554	16.308	18.068	19.831	21.600	23.370	25.144	28.699	32.254
.0150				12.800	14.617	16.442	18.278	20.120	21.968	23.820	25.677	29.400	33.124
.0155				12.801	14.679	16.578	18.491	20.414	22.345	24.280	26.222	30.118	34.017
.0160				12.803	14.743	16.717	18.711	20.717	22.732	24.753	26.783	30.857	34.935
.0165				12.806	14.811	16.863	18.940	21.032	23.135	25.245	27.364	31.622	35.885
.0170				12.811	14.886	17.019	19.182	21.364	23.557	25.759	27.971	32.418	36.872
.0175				12.821	14.970	17.189	19.442	21.717	24.004	26.301	28.608	33.250	37.902
.0180				12.837	15.068	17.377	19.724	22.095	24.480	26.875	29.282	34.124	38.980
.0185				12.864	15.183	17.588	20.033	22.504	24.990	27.488	29.997	35.047	40.114
.0190				12.904	15.321	17.827	20.375	22.950	25.542	28.146	30.761	36.026	41.310
.0195				12.963	15.487	18.100	20.755	23.439	26.141	28.856	31.581	37.068	42.577
.0200				13.047	15.687	18.414	21.181	23.978	26.795	29.625	32.464	38.182	43.923
.0205				13.164	15.929	18.775	21.661	24.577	27.513	30.462	33.420	39.375	45.356
.0210				13.322	16.221	19.193	22.202	25.242	28.302	31.376	34.457	40.658	46.886
.0215				13.533	16.573	19.677	22.816	25.984	29.174	32.376	35.585	42.041	48.523
.0220				13.806	16.995	20.237	23.511	26.814	30.137	33.473	36.815	43.535	50.279
.0225				14.155	17.498	20.885	24.300	27.742	31.205	34.678	38.159	45.151	52.165

Table 2. Pressures in Atmospheres at Integral Densities and Temperatures - Continued

DENSITY MOL/CC	TEMPERATURE DEGREES K												
	30.000	31.000	32.000	33.000	34.000	35.000	36.000	37.000	38.000	39.000	40.000	42.000	44.000
.0230			11.170	14.594	18.095	21.633	25.195	28.782	32.388	36.004	39.628	46.902	54.194
.0235			11.552	15.137	18.801	22.494	26.209	29.946	33.701	37.465	41.236	48.801	56.379
.0240			12.046	15.799	19.629	23.483	27.356	31.249	35.157	39.074	42.998	50.862	58.735
.0245			12.669	16.599	20.597	24.617	28.653	32.707	36.773	40.847	44.929	53.101	61.276
.0250			13.440	17.552	21.721	25.911	30.116	34.335	38.565	42.800	47.044	55.533	64.020
.0255		10.116	14.377	18.677	23.020	27.385	31.764	36.153	40.550	44.951	49.361	58.177	66.983
.0260		11.041	15.501	19.994	24.513	29.057	33.614	38.178	42.747	47.319	51.899	61.049	70.182
.0265		12.172	16.832	21.522	26.222	30.948	35.687	40.430	45.175	49.922	54.675	64.168	73.639
.0270	8.718	13.530	18.394	23.283	28.167	33.080	38.004	42.931	47.856	52.781	57.712	67.555	77.371
.0275	10.115	15.140	20.208	25.299	30.371	35.474	40.588	45.701	50.811	55.919	61.031	71.231	81.401
.0280	11.783	17.024	22.298	27.592	32.859	38.155	43.462	48.766	54.064	59.357	64.653	75.218	85.749
.0285	13.751	19.209	24.691	30.187	35.654	41.148	46.650	52.147	57.637	63.120	68.602	79.540	90.440
.0290	16.046	21.721	27.412	33.112	38.784	44.478	50.178	55.872	61.557	67.233	72.904	84.219	95.497
.0295	18.695	24.587	30.487	36.391	42.274	48.172	54.072	59.965	65.849	71.720	77.584	89.283	100.944
.0300	21.727	27.836	33.946	40.055	46.153	52.257	58.360	64.454	70.539	76.609	82.668	94.756	106.807
.0305	25.173	31.495	37.817	44.133	50.449	56.761	63.069	69.367	75.656	81.927	88.184	100.667	113.113
.0310	29.061	35.597	42.131	48.655	55.191	61.715	68.230	74.733	81.229	87.703	94.160	107.043	119.889
.0315	33.423	40.172	46.919	53.655	60.410	67.147	73.870	80.581	87.285	93.965	100.626	113.912	127.162
.0320	38.290	45.251	52.213	59.164	66.137	73.088	80.022	86.941	93.857	100.744	107.611	121.306	134.962
.0325	43.694	50.868	58.046	65.214	72.403	79.570	86.716	93.846	100.973	108.069	115.146	129.253	143.317
.0330	49.668	57.056	64.451	71.840	79.241	86.625	93.984	101.326	108.665	115.973	123.261	137.785	152.257
.0335	56.244	63.850	71.461	79.074	86.685	94.284	101.859	109.413	116.966	124.485	131.989	146.932	161.814
.0340	63.456	71.282	79.112	86.948	94.766	102.582	110.373	118.141	125.907	133.639	141.360	156.725	172.018
.0345	71.339	79.387	87.436	95.496	103.520	111.551	119.559	127.542	135.522	143.468	151.407	167.196	182.901
.0350	79.929	88.201	96.468	104.751	112.981	121.225	129.451	137.649	145.842	154.003	162.160	178.376	194.494
.0355	89.261	97.758	106.242	114.745	123.182	131.640	140.083	148.497	156.901	165.278	173.653	190.296	206.829
.0360	99.371	108.092	116.792	125.506	134.159	142.829	151.489	160.119	168.734	177.327	185.917	202.988	219.941
.0365	110.298	119.239	128.152	137.077	145.947	154.828	163.704	172.550	181.374	190.184	198.985	216.484	233.860
.0370	122.078	131.234	140.357	149.492	158.582	167.673	176.762	185.824	194.857	203.884	212.891	230.817	248.622
.0375	134.750	144.113	153.443	162.776	172.098	181.400	190.700	199.977	209.216	218.460	227.669	246.020	264.259
.0380	148.353	157.915	167.448	176.988	186.534	196.045	205.553	215.043	224.488	233.949	243.357	262.130	280.806
.0385	162.924	172.676	182.410	192.161	201.925	211.647	221.359	231.059	240.711	250.386	259.993	279.185	298.297
.0390	178.502	188.439	198.372	208.320	218.309	228.242	238.155	248.063	257.921	267.809	277.623	297.230	316.768
.0395	195.124	205.244	215.376	225.536	235.727	245.870	255.982	266.095	276.161	286.256	296.295	316.316	336.255
.0400	212.830	223.135	233.468	243.842	254.218	264.569	274.882	285.196	295.471	305.766	316.070	336.503	356.794
.0405	231.655	242.154	252.691	263.280	273.824	284.380	294.899	305.411	315.898	326.382	337.016	357.864	378.424
.0410	251.635	262.343	273.085	283.862	294.590	305.344	316.084	326.789	337.490	348.147	359.218	380.492	
.0415	272.806	283.734	294.680	305.640	316.560	327.505	338.489	349.386	360.304	371.108	382.782		
.0420	295.202	306.349	317.483	328.635	339.783	350.906	362.177	373.264	384.400	395.318			
.0425	318.859	330.186	341.467	352.805	364.303	375.596	387.215	398.495					
.0430	343.810	355.205	366.546	378.247	390.168								
.0435	370.092	381.308	392.547										
.0440	397.745												

Table 2. Pressures in Atmospheres at Integral Densities and Temperatures - Continued

DENSITY MOL/CC	TEMPERATURE DEGREES K													
	46.000	48.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000	90.000	95.000	100.000	
.0005	1.851	1.934	2.018	2.226	2.434	2.643	2.851	3.059	3.267	3.475	3.683	3.891	4.098	
.0010	3.631	3.800	3.970	4.393	4.816	5.238	5.661	6.082	6.504	6.927	7.348	7.769	8.190	
.0015	5.343	5.601	5.859	6.504	7.148	7.791	8.434	9.075	9.716	10.358	11.000	11.640	12.279	
.0020	6.990	7.340	7.690	8.563	9.433	10.304	11.173	12.039	12.907	13.774	14.641	15.506	16.369	
.0025	8.574	9.019	9.463	10.571	11.676	12.779	13.881	14.979	16.078	17.176	18.275	19.371	20.464	
.0030	10.100	10.642	11.183	12.533	13.878	15.221	16.561	17.897	19.234	20.570	21.905	23.238	24.567	
.0035	11.570	12.211	12.852	14.451	16.042	17.632	19.217	20.798	22.378	23.957	25.536	27.112	28.682	
.0040	12.986	13.730	14.474	16.327	18.172	20.014	21.851	23.683	25.513	27.341	29.170	30.995	32.813	
.0045	14.352	15.201	16.050	18.165	20.270	22.372	24.467	26.556	28.643	30.727	32.812	34.892	36.963	
.0050	15.670	16.628	17.584	19.967	22.339	24.708	27.068	29.420	31.771	34.117	36.465	38.806	41.137	
.0055	16.944	18.012	19.080	21.737	24.383	27.024	29.656	32.279	34.900	37.516	40.133	42.741	45.338	
.0060	18.176	19.358	20.539	23.478	26.404	29.326	32.236	35.136	38.034	40.926	43.820	46.701	49.571	
.0065	19.369	20.667	21.964	25.192	28.405	31.614	34.810	37.995	41.176	44.352	47.529	50.690	53.840	
.0070	20.527	21.944	23.360	26.883	30.391	33.894	37.382	40.858	44.330	47.797	51.264	54.712	58.148	
.0075	21.652	23.191	24.728	28.553	32.363	36.168	39.956	43.730	47.500	51.265	55.029	58.771	62.501	
.0080	22.748	24.411	26.073	30.208	34.326	38.439	42.535	46.614	50.690	54.761	58.829	62.872	66.903	
.0085	23.818	25.608	27.396	31.848	36.283	40.712	45.123	49.514	53.904	58.289	62.668	67.019	71.358	
.0090	24.864	26.784	28.702	33.479	38.238	42.990	47.723	52.435	57.146	61.852	66.549	71.218	75.872	
.0095	25.890	27.943	29.994	35.103	40.194	45.277	50.341	55.382	60.421	65.455	70.479	75.472	80.450	
.0100	26.900	29.088	31.275	36.725	42.155	47.577	52.980	58.357	63.733	69.103	74.461	79.787	85.096	
.0105	27.896	30.223	32.549	38.347	44.125	49.895	55.644	61.366	67.087	72.801	78.501	84.169	89.817	
.0110	28.882	31.351	33.820	39.974	46.109	52.234	58.339	64.414	70.488	76.554	82.605	88.623	94.618	
.0115	29.861	32.476	35.090	41.609	48.110	54.599	61.068	67.506	73.941	80.368	86.777	93.154	99.505	
.0120	30.838	33.601	36.364	43.258	50.132	56.995	63.838	70.647	77.453	84.247	91.023	97.769	104.485	
.0125	31.815	34.731	37.646	44.923	52.181	59.427	66.652	73.843	81.027	88.199	95.351	102.474	109.564	
.0130	32.797	35.869	38.940	46.610	54.261	61.900	69.517	77.099	84.671	92.229	99.766	107.276	114.748	
.0135	33.787	37.019	40.251	48.324	56.377	64.419	72.438	80.421	88.391	96.343	104.275	112.181	120.044	
.0140	34.790	38.186	41.582	50.068	58.535	66.989	75.421	83.815	92.193	100.549	108.885	117.196	125.461	
.0145	35.810	39.374	42.939	51.849	60.739	69.618	78.473	87.288	96.083	104.854	113.604	122.330	131.005	
.0150	36.851	40.589	44.327	53.671	62.996	72.311	81.599	90.847	100.069	109.265	118.439	127.589	136.685	
.0155	37.919	41.834	45.750	55.541	65.313	75.074	84.807	94.498	104.158	113.789	123.398	132.982	142.508	
.0160	39.018	43.116	47.214	57.464	67.694	77.914	88.104	98.249	108.358	118.435	128.491	138.517	148.484	
.0165	40.154	44.439	48.726	59.446	70.148	80.839	91.496	102.107	112.677	123.212	133.725	144.203	154.621	
.0170	41.333	45.811	50.291	61.495	72.680	83.855	94.993	106.081	117.123	128.127	139.109	150.050	160.929	
.0175	42.560	47.237	51.916	63.618	75.300	86.971	98.601	110.179	121.704	133.191	144.653	156.065	167.417	
.0180	43.842	48.723	53.607	65.822	78.014	90.195	102.330	114.409	126.431	138.412	150.366	162.260	174.094	
.0185	45.186	50.278	55.373	68.114	80.831	93.535	106.189	118.781	131.311	143.800	156.259	168.645	180.973	
.0190	46.600	51.909	57.221	70.504	83.760	97.001	110.186	123.305	136.356	149.366	162.341	175.230	188.063	
.0195	48.091	53.623	59.160	73.000	86.810	100.602	114.332	127.989	141.575	155.119	168.624	182.026	195.375	
.0200	49.668	55.431	61.197	75.612	89.991	104.348	118.637	132.846	146.980	161.071	175.117	189.045	202.921	

Table 2. Pressures in Atmospheres at Integral Densities and Temperatures - Continued

DENSITY MOL/CC	TEMPERATURE DEGREES K												
	46.000	48.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000	90.000	95.000	100.000
.0205	51.340	57.340	63.344	78.349	93.313	108.249	123.111	137.885	152.581	167.232	181.832	196.298	210.714
.0210	53.117	59.361	65.610	81.222	96.786	112.317	127.766	143.119	158.391	173.615	188.781	203.798	218.764
.0215	55.009	61.505	68.005	84.241	100.423	116.562	132.614	148.559	164.420	180.232	195.976	211.558	227.086
.0220	57.027	63.783	70.542	87.420	104.234	120.998	137.667	154.218	170.683	187.094	203.430	219.590	235.692
.0225	59.184	66.207	73.231	90.769	108.233	125.637	142.938	160.109	177.192	194.216	211.154	227.908	244.597
.0230	61.491	68.789	76.087	94.303	112.432	130.491	148.440	166.246	183.962	201.610	219.163	236.527	253.813
.0235	63.962	71.544	79.122	98.033	116.846	135.576	154.187	172.643	191.006	209.290	227.470	245.461	263.356
.0240	66.612	74.485	82.351	101.976	121.488	140.905	160.195	179.316	198.339	217.272	236.092	254.724	273.241
.0245	69.456	77.628	85.790	106.146	126.374	146.495	166.478	186.279	205.978	225.570	245.042	264.332	283.483
.0250	72.510	80.989	89.454	110.559	131.520	152.360	173.052	193.550	213.937	234.201	254.338	274.302	294.098
.0255	75.791	84.584	93.360	115.231	136.942	158.518	179.935	201.145	222.235	243.182	263.997	284.650	305.102
.0260	79.316	88.432	97.526	120.180	142.657	164.987	187.143	209.081	230.888	252.531	274.039	295.392	316.513
.0265	83.105	92.551	101.970	125.426	148.685	171.785	194.696	217.377	239.914	262.267	284.483	306.546	328.347
.0270	87.177	96.962	106.713	130.986	155.044	178.930	202.611	226.052	249.332	272.409	295.351	318.129	340.623
.0275	91.554	101.683	111.775	136.881	161.755	186.443	210.909	235.126	259.162	282.981	306.667	330.162	353.358
.0280	96.256	106.738	117.176	143.132	168.837	194.345	219.609	244.617	269.423	294.004	318.456	342.661	366.572
.0285	101.307	112.148	122.940	149.761	176.314	202.656	228.734	254.548	280.137	305.503	330.747	355.648	380.283
.0290	106.731	117.937	129.089	156.791	184.208	211.400	238.305	264.938	291.324	317.506	343.571	369.141	394.512
.0295	112.551	124.128	135.647	164.246	192.542	220.599	248.345	275.811	303.006	330.040	356.961	383.162	
.0300	118.793	130.748	142.640	172.149	201.340	230.277	258.877	287.188	315.207	343.136	370.954	397.731	
.0305	125.483	137.821	150.093	180.528	210.629	240.459	269.927	299.092	327.950	356.829	385.592		
.0310	132.649	145.374	158.031	189.408	220.433	251.169	281.519	311.546	341.258	371.154			
.0315	140.319	153.435	166.484	198.815	230.779	262.432	293.680	324.572	355.156	386.151			
.0320	148.520	162.032	175.477	208.777	241.694	274.276	306.437	338.196	369.670				
.0325	157.281	171.193	185.040	219.323	253.205	286.725	319.816	352.439	384.826				
.0330	166.634	180.948	195.201	230.479	265.337	299.805	333.848	367.326					
.0335	176.607	191.327	205.990	242.275	278.119	313.544	348.560	382.880					
.0340	187.232	202.361	217.436	254.738	291.574	327.365	363.984	399.124					
.0345	198.539	214.079	229.570	267.896	305.726	343.095	380.151						
.0350	210.559	226.513	242.420	281.775	320.600	358.956	397.090						
.0355	223.324	239.694	256.018	296.400	336.212	375.571							
.0360	236.865	253.653	270.393	311.795	352.581	392.961							
.0365	251.213	268.422	285.574	327.981	369.718								
.0370	266.399	284.032	301.590	344.977	387.629								
.0375	282.452	300.514	318.469	362.795									
.0380	299.403	317.898	336.239	381.446									
.0385	317.282	336.214	354.926										
.0390	336.115	355.493	374.554										
.0395	355.932	375.762	395.148										
.0400	376.757	397.049											
.0405	398.616												

Table 2-A. Density Adjustments for Smoothing
(In sequence of increasing densities of runs.)

Run No.	$\Delta\rho \cdot 10^6$	Run No.	$\Delta\rho \cdot 10^6$	Run No.	$\Delta\rho \cdot 10^6$
94	-0.04	50	+0.20	67	+5.01
93	+.29	80	+2.20	45	-2.25
92	-.40	79	+1.55	66	+3.34
91	-.41	78	+0.19	52	-0.76
90	+.02	77	-1.99	53	-2.53
89	+.66	49	-1.02	54	+1.39
88	+1.17	76	+0.36	55	+0.85
87	-0.92	75	+1.01	56	-1.32
86	-1.90	74	+1.08	57	+0.46
85	+0.68	73	+2.35	58	+1.90
84	+2.36	48	-10.33	59	-2.01
96	0.00	72	+2.31	60	-1.98
83	-2.21	71	+1.59	61	+3.67
51	+1.38	47	+2.47	62	-1.26
97	0.00	70	+0.18	63	-1.97
95	.00	46	+2.15	64	0.00
82	-.89	69	-6.09	65	.00
81	-1.79	68	-3.07		

Table 3 presents the data interpolated to isobars, that is to uniform pressures at the experimental temperatures. Table entries are densities in gram moles per cubic centimeter, multiplied by 1000. An iterative computer program was applied to locate these densities corresponding to assigned pressures on each isotherm, represented by the polynomial expansion described above.

The above polynomial representations of isotherms provide a smoothing in one of the two inde-

pendent variables only. The interpolated isochores of table 2 have been given polynomial representations for the purpose of computing changes in thermodynamic functions. Comparison of the interpolated isochore data with these representations shows a behavior which is smooth within the precision of pressure measurements [7]. Entries in the tables of this report may contain more than an experimentally significant number of digits. These are useful in smoothed data for obtaining derivatives by numerical methods.

Table 3. Densities in g mol/cc $\times 10^3$, at Integral Pressures and Temperatures

PRESSURE ATM	TEMPERATURE DEGREES K												
	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000
1.0	36.8295	36.3394	35.8205	35.2681				.5408	.5155	.4930	.4723	.4536	.4363
2.0	36.8833	36.3977	35.8836	35.3364	34.7530	34.1221		1.1672	1.1020	1.0453	.9949	.9501	.9097
3.0	36.9365	36.4553	35.9459	35.4037	34.8275	34.2046	33.5291	32.7862	1.7974	1.6825	1.5860	1.5026	1.4297
4.0	36.9892	36.5122	36.0073	35.4702	34.9009	34.2857	33.6211	32.8915	32.0828	31.1707	2.2782	2.1329	2.0116
5.0	37.0413	36.5684	36.0680	35.5359	34.9730	34.3653	33.7110	32.9940	32.2025	31.3146	30.2928	2.8822	2.6809
6.0	37.0928	36.6239	36.1278	35.6007	35.0440	34.4436	33.7990	33.0940	32.3185	31.4529	30.4649	29.2953	3.4868
7.0	37.1438	36.6788	36.1870	35.6646	35.1139	34.5205	33.8852	33.1916	32.4312	31.5862	30.6288	29.5104	28.1349
8.0	37.1943	36.7330	36.2454	35.7278	35.1828	34.5962	33.9696	33.2869	32.5408	31.7150	30.7853	29.7117	28.4162
9.0	37.2442	36.7867	36.3031	35.7901	35.2507	34.6707	34.0524	33.3800	32.6474	31.8395	30.9354	29.9014	28.6731
10.0	37.2937	36.8397	36.3602	35.8518	35.3176	34.7440	34.1337	33.4712	32.7512	31.9602	31.0795	30.0809	28.9100
11.0	37.3427	36.8922	36.4165	35.9126	35.3835	34.8162	34.2135	33.5605	32.8525	32.0773	31.2183	30.2516	29.1305
12.0	37.3913	36.9441	36.4723	35.9728	35.4486	34.8873	34.2918	33.6479	32.9514	32.1910	31.3521	30.4143	29.3372
13.0	37.4394	36.9955	36.5274	36.0322	35.5128	34.9574	34.3688	33.7337	33.0480	32.3017	31.4815	30.5701	29.5318
14.0	37.4870	37.0464	36.5820	36.0910	35.5762	35.0264	34.4445	33.8178	33.1425	32.4094	31.6068	30.7195	29.7162
15.0	37.5342	37.0968	36.6359	36.1491	35.6388	35.0945	34.5190	33.9003	33.2350	32.5145	31.7283	30.8631	29.8914
16.0	37.5810	37.1467	36.6893	36.2065	35.7005	35.1617	34.5923	33.9814	33.3255	32.6169	31.8461	31.0016	30.0585
17.0	37.6274	37.1961	36.7422	36.2634	35.7615	35.2279	34.6645	34.0610	33.4142	32.7170	31.9607	31.1353	30.2184
18.0	37.6734	37.2451	36.7945	36.3195	35.8218	35.2933	34.7356	34.1393	33.5012	32.8148	32.0723	31.2646	30.3718
19.0	37.7189	37.2936	36.8463	36.3751	35.8814	35.3578	34.8057	34.2163	33.5865	32.9104	32.1809	31.3899	30.5193
20.0	37.7641	37.3416	36.8976	36.4301	35.9403	35.4215	34.8747	34.2920	33.6703	33.0041	32.2868	31.5114	30.6614
22.0	37.8534	37.4365	36.9986	36.5384	36.0560	35.5465	35.0099	34.4400	33.8333	33.1856	32.4912	31.7443	30.9313
24.0	37.9413	37.5297	37.0978	36.6445	36.1693	35.6685	35.1415	34.5835	33.9909	33.3602	32.6865	31.9650	31.1845
26.0	38.0278	37.6213	37.1953	36.7486	36.2801	35.7877	35.2698	34.7229	34.1434	33.5284	32.8736	32.1750	31.4232
28.0	38.1130	37.7115	37.2909	36.8506	36.3886	35.9042	35.3949	34.8585	34.2912	33.6907	33.0533	32.3755	31.6494
30.0	38.1969	37.8002	37.3850	36.9507	36.4951	36.0182	35.5170	34.9905	34.4347	33.8478	33.2264	32.5675	31.8646
32.0	38.2796	37.8876	37.4775	37.0491	36.5994	36.1297	35.6363	35.1192	34.5742	33.9999	33.3934	32.7518	32.0699
34.0	38.3612	37.9736	37.5685	37.1456	36.7018	36.2390	35.7530	35.2447	34.7100	34.1475	33.5548	32.9291	32.2664
36.0	38.4417	38.0584	37.6581	37.2406	36.8023	36.3461	35.8673	35.3673	34.8422	34.2909	33.7110	33.1001	32.4550
38.0	38.5210	38.1421	37.7463	37.3339	36.9011	36.4512	35.9791	35.4872	34.9712	34.4303	33.8624	33.2653	32.6364
40.0	38.5993	38.2245	37.8331	37.4257	36.9982	36.5543	36.0888	35.6044	35.0970	34.5660	34.0094	33.4251	32.8113
42.0	38.6767	38.3058	37.9187	37.5161	37.0936	36.6555	36.1963	35.7191	35.2200	34.6982	34.1523	33.5800	32.9801
44.0	38.7530	38.3861	38.0031	37.6050	37.1875	36.7549	36.3017	35.8315	35.3401	34.8273	34.2914	33.7303	33.1434
46.0	38.8285	38.4653	38.0862	37.6926	37.2799	36.8527	36.4053	35.9416	35.4577	34.9532	34.4268	33.8764	33.3016
48.0	38.9030	38.5435	38.1683	37.7789	37.3708	36.9487	36.5070	36.0496	35.5729	35.0763	34.5589	34.0184	33.4551
50.0	38.9766	38.6207	38.2492	37.8639	37.4604	37.0432	36.6069	36.1556	35.6856	35.1967	34.6877	34.1567	33.6042
55.0	39.1571	38.8097	38.4470	38.0713	37.6785	37.2730	36.8495	36.4123	35.9581	35.4866	34.9972	34.4877	33.9595
60.0	39.3327	38.9933	38.6386	38.2719	37.8891	37.4942	37.0825	36.6581	36.2182	35.7624	35.2902	34.7999	34.2928
65.0	39.5037	39.1718	38.8247	38.4661	38.0927	37.7076	37.3069	36.8942	36.4672	36.0255	35.5689	35.0956	34.6074
70.0	39.6705	39.3456	39.0054	38.6545	38.2899	37.9139	37.5234	37.1214	36.7062	36.2774	35.8349	35.3769	34.9054
75.0	39.8333	39.5149	39.1813	38.8376	38.4812	38.1135	37.7326	37.3405	36.9363	36.5192	36.0894	35.6454	35.1890

Table 3. Densities in g mol/cc x 10³, at Integral Pressures and Temperatures - Continued

PRESSURE ATM	TEMPERATURE DEGREES K												
	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	29.000
80.0	39.9925	39.6801	39.3527	39.0156	38.6670	38.3072	37.9352	37.5522	37.1581	36.7518	36.3337	35.9024	35.4597
85.0	40.1481	39.8413	39.5197	39.1890	38.8477	38.4952	38.1315	37.7572	37.3723	36.9760	36.5687	36.1491	35.7188
90.0	40.3005	39.9989	39.6828	39.3581	39.0236	38.6780	38.3221	37.9558	37.5796	37.1925	36.7951	36.3863	35.9675
95.0	40.4498	40.1529	39.8422	39.5231	39.1950	38.8559	38.5074	38.1486	37.7805	37.4020	37.0138	36.6150	36.2068
100.0	40.5961	40.3036	39.9979	39.6842	39.3622	39.0293	38.6877	38.3360	37.9755	37.6050	37.2254	36.8359	36.4374
105.0	40.7397	40.4511	40.1504	39.8418	39.5254	39.1984	38.8633	38.5183	38.1649	37.8020	37.4304	37.0495	36.6601
110.0		40.5956	40.2996	39.9960	39.6849	39.3635	39.0345	38.6959	38.3491	37.9933	37.6292	37.2565	36.8755
115.0		40.7372	40.4458	40.1470	39.8409	39.5248	39.2016	38.8689	38.5286	38.1794	37.8224	37.4572	37.0842
120.0		40.8760	40.5892	40.2949	39.9936	39.6826	39.3648	39.0379	38.7034	38.3607	38.0102	37.6523	37.2867
125.0		41.0122	40.7298	40.4399	40.1431	39.8370	39.5243	39.2028	38.8741	38.5373	38.1932	37.8419	37.4834
130.0		41.1458	40.8679	40.5822	40.2896	39.9881	39.6804	39.3640	39.0407	38.7096	38.3714	38.0266	37.6746
135.0		41.2770	41.0034	40.7218	40.4332	40.1363	39.8331	39.5217	39.2035	38.8778	38.5453	38.2065	37.8608
140.0		41.4058	41.1366	40.8589	40.5742	40.2815	39.9827	39.6760	39.3627	39.0423	38.7151	38.3820	38.0422
145.0			41.2675	40.9935	40.7125	40.4240	40.1294	39.8272	39.5186	39.2030	38.8810	38.5533	38.2192
150.0			41.3963	41.1258	40.8483	40.5638	40.2732	39.9753	39.6712	39.3604	39.0432	38.7207	38.3920
155.0			41.5230	41.2559	40.9818	40.7011	40.4143	40.1206	39.8207	39.5144	39.2020	38.8844	38.5608
160.0			41.6476	41.3838	41.1130	40.8361	40.5528	40.2631	39.9673	39.6654	39.3574	39.0445	38.7258
165.0			41.7703	41.5096	41.2420	40.9687	40.6888	40.4029	40.1111	39.8134	39.5097	39.2013	38.8872
170.0			41.8912	41.6335	41.3690	41.0991	40.8225	40.5403	40.2523	39.9586	39.6590	39.3549	39.0453
175.0			42.0103	41.7553	41.4939	41.2274	40.9539	40.6753	40.3909	40.1011	39.8055	39.5055	39.2002
180.0			42.1277	41.8753	41.6169	41.3536	41.0832	40.8080	40.5271	40.2411	39.9493	39.6532	39.3520
185.0				41.9934	41.7381	41.4779	41.2104	40.9384	40.6610	40.3786	40.0904	39.7981	39.5009
190.0				42.1098	41.8575	41.6003	41.3356	41.0668	40.7926	40.5137	40.2291	39.9404	39.6470
195.0				42.2244	41.9751	41.7208	41.4589	41.1931	40.9221	40.6465	40.3654	40.0802	39.7904
200.0				42.3373	42.0911	41.8396	41.5803	41.3175	41.0496	40.7772	40.4994	40.2176	39.9313
210.0				42.5583	42.3184	42.0721	41.8179	41.5607	41.2986	41.0324	40.7609	40.4854	40.2059
220.0				42.7730	42.5396	42.2982	42.0489	41.7969	41.5403	41.2799	41.0143	40.7447	40.4715
230.0					42.7553	42.5183	42.2738	42.0267	41.7752	41.5203	41.2602	40.9961	40.7288
240.0					42.9658	42.7328	42.4929	42.2504	42.0038	41.7539	41.4990	41.2402	40.9784
250.0					43.1713	42.9420	42.7067	42.4685	42.2265	41.9813	41.7314	41.4774	41.2208
260.0					43.3722	43.1461	42.9155	42.6814	42.4436	42.2028	41.9577	41.7083	41.4566
270.0						43.3454	43.1196	42.8893	42.6556	42.4189	42.1782	41.9332	41.6861
280.0						43.5401	43.3193	43.0926	42.8627	42.6298	42.3933	42.1525	41.9098
290.0						43.7306	43.5148	43.2916	43.0653	42.8358	42.6034	42.3666	42.1280
300.0						43.9168	43.7064	43.4865	43.2635	43.0373	42.8086	42.5757	42.3411
310.0						44.0992	43.8943	43.6776	43.4578	43.2344	43.0094	42.7801	42.5492
320.0							44.0787	43.8651	43.6481	43.4274	43.2058	42.9802	42.7528
330.0							44.2597	44.0492	43.8349	43.6165	43.3982	43.1760	42.9520
340.0							44.4377	44.2302	44.0183	43.8019	43.5867	43.3680	43.1470
350.0							44.6126	44.4081	44.1984	43.9837	43.7716	43.5561	43.3382

Table 3. Densities in g mol/cc x 10³, at Integral Pressures and Temperatures - Continued

PRESSURE ATM	TEMPERATURE DEGREES K													
	30.000	31.000	32.000	33.000	34.000	35.000	36.000	37.000	38.000	39.000	40.000	42.000	44.000	
1.0	.4204	.4057	.3920	.3792	.3673	.3561	.3457	.3358	.3265	.3177	.3094	.2941	.2803	
2.0	.8729	.8395	.8086	.7802	.7538	.7294	.7066	.6853	.6654	.6466	.6289	.5965	.5674	
3.0	1.3650	1.3069	1.2543	1.2064	1.1624	1.1221	1.0847	1.0500	1.0177	.9875	.9592	.9076	.8618	
4.0	1.9074	1.8159	1.7348	1.6623	1.5965	1.5367	1.4819	1.4314	1.3848	1.3415	1.3011	1.2281	1.1637	
5.0	2.5165	2.3779	2.2583	2.1537	2.0604	1.9766	1.9008	1.8317	1.7683	1.7099	1.6557	1.5586	1.4736	
6.0	3.2208	3.0107	2.8367	2.6885	2.5598	2.4460	2.3445	2.2530	2.1699	2.0939	2.0241	1.8998	1.7919	
7.0	4.0764	3.7447	3.4880	3.2786	3.1026	2.9503	2.8169	2.6983	2.5917	2.4953	2.4074	2.2523	2.1192	
8.0	5.2291	4.6396	4.2423	3.9413	3.6996	3.4966	3.3228	3.1710	3.0364	2.9159	2.8071	2.6171	2.4558	
9.0	27.1088	5.8469	5.1568	4.7053	4.3666	4.0947	3.8687	3.6754	3.5068	3.3578	3.2247	2.9950	2.8023	
10.0	27.4623	25.4290	6.3695	5.6218	5.1284	4.7587	4.4631	4.2170	4.0068	3.8237	3.6620	3.3869	3.1593	
11.0	27.7759	25.9797	8.4901	6.8014	6.0275	5.5091	5.1173	4.8028	4.5408	4.3166	4.1213	3.7940	3.5274	
12.0	28.0591	26.4298	23.9583	8.5927	7.1458	6.3786	5.8477	5.4419	5.1143	4.8400	4.6047	4.2174	3.9071	
13.0	28.3183	26.8151	24.7272	19.7426	8.6788	7.4227	6.6778	6.1463	5.7342	5.3982	5.1152	4.6584	4.2993	
14.0	28.5580	27.1546	25.3100	22.2921	11.3328	8.7465	7.6434	6.9323	6.4092	5.9962	5.6558	5.1185	4.7044	
15.0	28.7813	27.4597	25.7879	23.3835	17.6605	10.5749	8.8006	7.8222	7.1501	6.6399	6.2301	5.5990	5.1232	
16.0	28.9907	27.7378	26.1972	24.1344	20.6298	13.3863	10.2381	8.8457	7.9698	7.3361	6.8421	6.1017	5.5564	
17.0	29.1883	27.9940	26.5576	24.7211	22.0056	16.9414	12.0760	10.0406	8.8841	8.0925	7.4959	6.6279	6.0047	
18.0	29.3754	28.2322	26.8810	25.2090	22.9256	19.3244	14.3387	11.4443	9.9092	8.9169	8.1959	7.1793	6.4686	
19.0	29.5534	28.4551	27.1754	25.6299	23.6276	20.7778	16.6267	13.0600	11.0572	9.8161	8.9459	7.7572	6.9486	
20.0	29.7233	28.6648	27.4463	26.0021	24.2007	21.7969	18.4487	14.7932	12.3248	10.7936	9.7482	8.3626	7.4452	
22.0	30.0420	29.0516	27.9327	26.6427	25.1135	23.2218	20.8204	17.8783	15.0425	12.9522	11.5051	9.6564	8.4882	
24.0	30.3367	29.4026	28.3622	27.1856	25.8357	24.2362	22.3172	20.0189	17.4958	15.1974	13.4046	11.0513	9.5954	
26.0	30.6115	29.7250	28.7484	27.6598	26.4387	25.0320	23.4021	21.5099	19.3861	17.2258	15.2981	12.5153	10.7573	
28.0	30.8693	30.0238	29.1004	28.0828	26.9596	25.6912	24.2558	22.6293	20.8142	18.8921	17.0232	13.9928	11.9558	
30.0	31.1125	30.3027	29.4247	28.4659	27.4200	26.2569	24.9623	23.5219	21.9318	20.2292	18.5020	15.4187	13.1645	
32.0	31.3429	30.5646	29.7258	28.8168	27.8340	26.7541	25.5672	24.2645	22.8417	21.3175	19.7419	16.7402	14.3523	
34.0	31.5621	30.8119	30.0074	29.1411	28.2111	27.1991	26.0976	24.9014	23.6071	22.2247	20.7847	17.9306	15.4908	
36.0	31.7714	31.0463	30.2721	29.4432	28.5580	27.6026	26.5709	25.4600	24.2672	22.9985	21.6736	18.9871	16.5592	
38.0	31.9716	31.2693	30.5223	29.7263	28.8798	27.9725	26.9991	25.9582	24.8479	23.6718	22.4432	19.9207	17.5466	
40.0	32.1638	31.4822	30.7596	29.9929	29.1803	28.3145	27.3908	26.4085	25.3665	24.2672	23.1198	20.7481	18.4510	
42.0	32.3487	31.6860	30.9855	30.2450	29.4626	28.6330	27.7522	26.8199	25.8357	24.8010	23.7223	21.4856	19.2758	
44.0	32.5268	31.8815	31.2013	30.4845	29.7289	28.9314	28.0881	27.1991	26.2643	25.2848	24.2652	22.1481	20.0278	
46.0	32.6989	32.0696	31.4079	30.7126	29.9812	29.2123	28.4021	27.5510	26.6592	25.7274	24.7589	22.7476	20.7146	
48.0	32.8653	32.2509	31.6062	30.9306	30.2212	29.4779	28.6972	27.8797	27.0255	26.1355	25.2119	23.2942	21.3439	
50.0	33.0264	32.4259	31.7969	31.1394	30.4500	29.7299	28.9759	28.1882	27.3675	26.5143	25.6302	23.7959	21.9228	
55.0	33.4090	32.8390	32.2448	31.6265	30.9808	30.3102	29.6123	28.8872	28.1356	27.3583	26.5556	24.8938	23.1888	
60.0	33.7661	33.2223	32.6575	32.0719	31.4624	30.8322	30.1794	29.5041	28.8068	28.0886	27.3494	25.8222	24.2536	
65.0	34.1014	33.5804	33.0408	32.4831	31.9043	31.3078	30.6924	30.0578	29.4046	28.7340	28.0457	26.6267	25.1697	
70.0	34.4181	33.9169	33.3994	32.8656	32.3135	31.7456	31.1617	30.5613	29.9447	29.3134	28.6671	27.3370	25.9725	
75.0	34.7183	34.2347	33.7366	33.2238	32.6950	32.1520	31.5951	31.0238	30.4382	29.8401	29.2291	27.9736	26.6869	

Table 3. Densities in $\text{g mol/cc} \times 10^3$, at Integral Pressures and Temperatures - Continued

PRESSURE ATM	TEMPERATURE DEGREES K													
	30.000	31.000	32.000	33.000	34.000	35.000	36.000	37.000	38.000	39.000	40.000	42.000	44.000	
80.0	35.0040	34.5361	34.0554	33.5610	33.0529	32.5317	31.9983	31.4522	30.8933	30.3236	29.7428	28.5510	27.3305	
85.0	35.2767	34.8231	34.3579	33.8801	33.3904	32.8885	32.3757	31.8517	31.3161	30.7711	30.2164	29.0797	27.9165	
90.0	35.5379	35.0972	34.6461	34.1832	33.7100	33.2253	32.7310	32.2265	31.7115	31.1881	30.6562	29.5678	28.4547	
95.0	35.7886	35.3597	34.9214	34.4720	34.0139	33.5447	33.0668	32.5798	32.0831	31.5789	31.0672	30.0214	28.9525	
100.0	36.0298	35.6118	35.1852	34.7482	34.3036	33.8486	33.3855	32.9142	32.4339	31.9470	31.4533	30.4455	29.4160	
105.0	36.2623	35.8544	35.4386	35.0129	34.5808	34.1386	33.6890	33.2320	32.7665	32.2951	31.8176	30.8439	29.8497	
110.0	36.4869	36.0883	35.6825	35.2673	34.8466	34.4162	33.9789	33.5348	33.0830	32.6257	32.1626	31.2198	30.2577	
115.0	36.7040	36.3142	35.9177	35.5122	35.1020	34.6826	34.2566	33.8244	33.3849	32.9405	32.4907	31.5759	30.6429	
120.0	36.9144	36.5328	36.1449	35.7485	35.3480	34.9387	34.5231	34.1019	33.6738	33.2411	32.8035	31.9143	31.0079	
125.0	37.1185	36.7447	36.3649	35.9772	35.5854	35.1855	34.7795	34.3684	33.9509	33.5291	33.1025	32.2369	31.3550	
130.0	37.3167	36.9502	36.5780	36.1983	35.8148	35.4236	35.0267	34.6250	34.2172	33.8055	33.3892	32.5452	31.6860	
135.0	37.5095	37.1499	36.7849	36.4127	36.0369	35.6539	35.2654	34.8724	34.4738	34.0714	33.6645	32.8406	32.0024	
140.0	37.6971	37.3441	36.9859	36.6209	36.2521	35.8769	35.4962	35.1114	34.7213	34.3276	33.9296	33.1243	32.3056	
145.0	37.8800	37.5332	37.1814	36.8231	36.4611	36.0931	35.7198	35.3426	34.9605	34.5749	34.1852	33.3972	32.5967	
150.0	38.0583	37.7175	37.3717	37.0200	36.6642	36.3030	35.9367	35.5666	35.1920	34.8140	34.4320	33.6603	32.8769	
155.0	38.2323	37.8972	37.5573	37.2115	36.8617	36.5069	36.1472	35.7839	35.4164	35.0456	34.6709	33.9143	33.1469	
160.0	38.4024	38.0727	37.7383	37.3982	37.0541	36.7054	36.3519	35.9950	35.6342	35.2701	34.9022	34.1600	33.4076	
165.0	38.5686	38.2441	37.9150	37.5804	37.2416	36.8987	36.5511	36.2003	35.8458	35.4881	35.1267	34.3979	33.6596	
170.0	38.7312	38.4118	38.0876	37.7583	37.4245	37.0871	36.7452	36.4001	36.0516	35.6999	35.3446	34.6285	33.9036	
175.0	38.8904	38.5758	38.2564	37.9320	37.6032	37.2710	36.9344	36.5948	36.2519	35.9059	35.5565	34.8524	34.1402	
180.0	39.0464	38.7363	38.4216	38.1019	37.7777	37.4505	37.1191	36.7846	36.4472	36.1066	35.7628	35.0700	34.3698	
185.0	39.1993	38.8936	38.5833	38.2681	37.9484	37.6259	37.2994	36.9699	36.6376	36.3022	35.9637	35.2818	34.5929	
190.0	39.3492	39.0478	38.7417	38.4309	38.1154	37.7975	37.4756	37.1509	36.8235	36.4930	36.1596	35.4880	34.8099	
195.0	39.4964	39.1990	38.8970	38.5903	38.2790	37.9653	37.6480	37.3278	37.0052	36.6794	36.3508	35.6890	35.0211	
200.0	39.6408	39.3473	39.0493	38.7467	38.4392	38.1297	37.8167	37.5008	37.1827	36.8614	36.5376	35.8850	35.2270	
210.0	39.9221	39.6360	39.3453	39.0501	38.7503	38.4487	38.1438	37.8361	37.5264	37.2136	36.8986	36.2636	35.6237	
220.0	40.1940	39.9146	39.6307	39.3426	39.0499	38.7555	38.4582	38.1580	37.8562	37.5511	37.2443	36.6254	36.0022	
230.0	40.4572	40.1840	39.9065	39.6245	39.3389	39.0512	38.7610	38.4679	38.1733	37.8753	37.5762	36.9723	36.3643	
240.0	40.7124	40.4449	40.1733	39.8974	39.6182	39.3368	39.0531	38.7666	38.4787	38.1875	37.8955	37.3055	36.7115	
250.0	40.9602	40.6978	40.4318	40.1617	39.8885	39.6130	39.3355	39.0551	38.7735	38.4886	38.2032	37.6262	37.0452	
260.0	41.2010	40.9435	40.6826	40.4177	40.1505	39.8805	39.6088	39.3342	39.0585	38.7795	38.5002	37.9355	37.3666	
270.0	41.4353	41.1823	40.9262	40.6664	40.4047	40.1399	39.8736	39.6046	39.3343	39.0609	38.7873	38.2342	37.6767	
280.0	41.6637	41.4147	41.1632	40.9084	40.6517	40.3919	40.1306	39.8668	39.6017	39.3336	39.0653	38.5232	37.9763	
290.0	41.8863	41.6413	41.3940	41.1434	40.8919	40.6368	40.3802	40.1214	39.8612	39.5981	39.3346	38.8030	38.2663	
300.0	42.1036	41.8623	41.6191	41.3728	41.1257	40.8752	40.6230	40.3689	40.1133	39.8551	39.5959	39.0743	38.5473	
310.0	42.3159	42.0783	41.8388	41.5970	41.3536	41.1074	40.8593	40.6097	40.3585	40.1049	39.8496	39.3376	38.8199	
320.0	42.5235	42.2894	42.0537	41.8154	41.5758	41.3337	41.0894	40.8442	40.5971	40.3481	40.0960	39.5934	39.0848	
330.0	42.7265	42.4962	42.2639	42.0294	41.7927	41.5546	41.3138	41.0728	40.8297	40.5850	40.3357	39.8420	39.3424	
340.0	42.9253	42.6989	42.4701	42.2384	42.0046	41.7703	41.5327	41.2957	41.0564	40.8160	40.5689	40.0838	39.5931	
350.0	43.1201	42.8978	42.6724	42.4436	42.2116	41.9811	41.7464	41.5132	41.2776	41.0414	40.7960	40.3192	39.8375	

Table 3. Densities in g mol/cc x 10³, at Integral Pressures and Temperatures - Continued

PRESSURE ATM	TEMPERATURE DEGREES K												
	46.000	48.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000	90.000	95.000	100.000
1.0	.2677	.2562	.2457	.2229	.2041	.1881	.1746	.1628	.1526	.1435	.1355	.1283	.1219
2.0	.5412	.5173	.4955	.4486	.4100	.3776	.3500	.3263	.3056	.2873	.2712	.2568	.2439
3.0	.8206	.7834	.7496	.6771	.6178	.5683	.5264	.4904	.4590	.4315	.4071	.3854	.3659
4.0	1.1062	1.0546	1.0079	.9083	.8275	.7604	.7037	.6551	.6129	.5759	.5432	.5141	.4880
5.0	1.3984	1.3312	1.2706	1.1424	1.0392	.9537	.8818	.8204	.7672	.7205	.6794	.6429	.6101
6.0	1.6973	1.6132	1.5378	1.3794	1.2527	1.1483	1.0608	.9863	.9218	.8655	.8158	.7717	.7323
7.0	2.0032	1.9010	1.8097	1.6193	1.4681	1.3442	1.2407	1.1528	1.0769	1.0107	.9524	.9007	.8545
8.0	2.3166	2.1946	2.0864	1.8621	1.6853	1.5413	1.4214	1.3199	1.2324	1.1561	1.0891	1.0298	.9767
9.0	2.6376	2.4943	2.3679	2.1078	1.9045	1.7396	1.6029	1.4875	1.3882	1.3018	1.2259	1.1589	1.0990
10.0	2.9666	2.8002	2.6544	2.3566	2.1255	1.9392	1.7852	1.6556	1.5443	1.4477	1.3629	1.2880	1.2213
11.0	3.3040	3.1126	2.9460	2.6083	2.3484	2.1399	1.9683	1.8242	1.7008	1.5938	1.5000	1.4173	1.3435
12.0	3.6500	3.4317	3.2428	2.8630	2.5731	2.3418	2.1521	1.9934	1.8576	1.7400	1.6372	1.5465	1.4658
13.0	4.0051	3.7576	3.5449	3.1207	2.7997	2.5449	2.3368	2.1630	2.0147	1.8865	1.7745	1.6759	1.5881
14.0	4.3696	4.0905	3.8524	3.3815	3.0281	2.7491	2.5221	2.3331	2.1721	2.0332	1.9119	1.8052	1.7104
15.0	4.7437	4.4306	4.1654	3.6453	3.2582	2.9545	2.7082	2.5036	2.3297	2.1800	2.0494	1.9346	1.8326
16.0	5.1280	4.7781	4.4839	3.9121	3.4902	3.1609	2.8949	2.6745	2.4877	2.3269	2.1869	2.0639	1.9549
17.0	5.5225	5.1330	4.8080	4.1820	3.7239	3.3684	3.0823	2.8459	2.6458	2.4740	2.3245	2.1933	2.0770
18.0	5.9277	5.4955	5.1377	4.4548	3.9594	3.5769	3.2703	3.0176	2.8042	2.6212	2.4622	2.3227	2.1992
19.0	6.3437	5.8657	5.4731	4.7305	4.1965	3.7865	3.4590	3.1897	2.9628	2.7686	2.5998	2.4521	2.3213
20.0	6.7706	6.2435	5.8141	5.0092	4.4353	3.9970	3.6482	3.3622	3.1216	2.9160	2.7376	2.5814	2.4434
22.0	7.6572	7.0221	6.5127	5.5750	4.9176	4.4208	4.0283	3.7081	3.4398	3.2111	3.0130	2.8400	2.6873
24.0	8.5863	7.8304	7.2328	6.1516	5.4059	4.8481	4.4105	4.0551	3.7585	3.5064	3.2885	3.0984	2.9310
26.0	9.5540	8.6659	7.9728	6.7382	5.8997	5.2785	4.7944	4.4031	4.0777	3.8019	3.5639	3.3566	3.1743
28.0	10.5526	9.5248	8.7304	7.3338	6.3984	5.7116	5.1799	4.7519	4.3972	4.0973	3.8391	3.6145	3.4173
30.0	11.5709	10.4015	9.5022	7.9370	6.9013	6.1471	5.5666	5.1013	4.7169	4.3927	4.1140	3.8720	3.6598
32.0	12.5944	11.2884	10.2841	8.5464	7.4077	6.5845	5.9542	5.4511	5.0366	4.6879	4.3886	4.1291	3.9018
34.0	13.6067	12.1768	11.0710	9.1602	7.9167	7.0233	6.3426	5.8011	5.3563	4.9827	4.6627	4.3858	4.1433
36.0	14.5921	13.0573	11.8573	9.7765	8.4275	7.4631	6.7313	6.1511	5.6756	5.2772	4.9364	4.6418	4.3842
38.0	15.5373	13.9208	12.6372	10.3932	8.9391	7.9034	7.1201	6.5009	5.9946	5.5711	5.2095	4.8973	4.6245
40.0	16.4331	14.7590	13.4048	11.0080	9.4504	8.3435	7.5086	6.8503	6.3131	5.8645	5.4819	5.1520	4.8641
42.0	17.2745	15.5656	14.1550	11.6189	9.9605	8.7829	7.8964	7.1991	6.6309	6.1570	5.7535	5.4061	5.1030
44.0	18.0600	16.3359	14.8834	12.2235	10.4683	9.2211	8.2833	7.5470	6.9478	6.4488	6.0244	5.6594	5.3411
46.0	18.7910	17.0675	15.5865	12.8199	10.9727	9.6575	8.6690	7.8938	7.2638	6.7396	6.2943	5.9118	5.5784
48.0	19.4702	17.7594	16.2619	13.4062	11.4728	10.0915	9.0530	8.2394	7.5786	7.0294	6.5633	6.1633	5.8149
50.0	20.1017	18.4123	16.9084	13.9807	11.9676	10.5226	9.4351	8.5834	7.8922	7.3180	6.8313	6.4138	6.0504
55.0	21.4977	19.8833	18.3961	15.3568	13.1757	11.5841	10.3796	9.4355	8.6696	8.0340	7.4962	7.0357	6.6351
60.0	22.6808	21.1521	19.7093	16.6368	14.3336	12.6167	11.3051	10.2738	9.4361	8.7408	8.1531	7.6504	7.2134
65.0	23.7000	22.2549	20.8681	17.8158	15.4333	13.6140	12.2075	11.0953	10.1897	9.4372	8.8011	8.2573	7.7846
70.0	24.5917	23.2238	21.8956	18.8963	16.4704	14.5717	13.0834	11.8976	10.9287	10.1219	9.4394	8.8556	8.3483
75.0	25.3827	24.0842	22.8132	19.8850	17.4437	15.4868	13.9300	12.6788	11.6516	10.7939	10.0671	9.4449	8.9039

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Table 3. Densities in g mol/cc x 10³, at Integral Pressures and Temperatures - Continued

PRESSURE ATM	TEMPERATURE DEGREES K												
	46.000	48.000	50.000	55.000	60.000	65.000	70.000	75.000	80.000	85.000	90.000	95.000	100.000
80.0	26.0930	24.8564	23.6390	20.7904	18.3545	16.3581	14.7458	13.4372	12.3572	11.4521	10.6835	10.0244	9.4512
85.0	26.7372	25.5557	24.3879	21.6217	19.2057	17.1856	15.5296	14.1719	13.0446	12.0959	11.2881	10.5939	9.9897
90.0	27.3266	26.1944	25.0719	22.3875	20.0014	17.9702	16.2813	14.8821	13.7130	12.7247	11.8803	11.1529	10.5192
95.0	27.8699	26.7818	25.7007	23.0956	20.7457	18.7136	17.0010	15.5677	14.3620	13.3379	12.4598	11.7011	11.0394
100.0	28.3740	27.3256	26.2823	23.7529	21.4431	19.4177	17.6895	16.2287	14.9914	13.9353	13.0262	12.2383	11.5501
105.0	28.8443	27.8319	26.8231	24.3654	22.0976	20.0850	18.3478	16.8654	15.6013	14.5167	13.5794	12.7643	12.0511
110.0	29.2852	28.3055	27.3284	24.9383	22.7134	20.7178	18.9771	17.4785	16.1917	15.0821	14.1192	13.2790	12.5425
115.0	29.7004	28.7505	27.8025	25.4760	23.2939	21.3185	19.5788	18.0685	16.7631	15.6316	14.6457	13.7825	13.0241
120.0	30.0928	29.1704	28.2490	25.9823	23.8425	21.8894	20.1544	18.6364	17.3158	16.1653	15.1588	14.2745	13.4958
125.0	30.4650	29.5678	28.6711	26.4605	24.3620	22.4327	20.7053	19.1830	17.8503	16.6836	15.6587	14.7554	13.9579
130.0	30.8191	29.9452	29.0714	26.9135	24.8550	22.9504	21.2329	19.7092	18.3673	17.1867	16.1456	15.2251	14.4102
135.0	31.1569	30.3045	29.4521	27.3437	25.3240	23.4445	21.7387	20.2160	18.8672	17.6750	16.6197	15.6838	14.8529
140.0	31.4799	30.6477	29.8150	27.7532	25.7708	23.9167	22.2239	20.7043	19.3509	18.1490	17.0814	16.1317	15.2862
145.0	31.7895	30.9760	30.1618	28.1439	26.1975	24.3686	22.6900	21.1751	19.8189	18.6092	17.5308	16.5690	15.7101
150.0	32.0868	31.2909	30.4940	28.5175	26.6056	24.8017	23.1379	21.6292	20.2718	19.0560	17.9684	16.9958	16.1248
155.0	32.3729	31.5934	30.8128	28.8754	26.9966	25.2173	23.5690	22.0676	20.7104	19.4898	18.3945	17.4125	16.5304
160.0	32.6487	31.8847	31.1193	29.2188	27.3718	25.6167	23.9842	22.4909	21.1353	19.9113	18.8094	17.8193	16.9272
165.0	32.9149	32.1655	31.4145	29.5490	27.7325	26.0010	24.3844	22.9001	21.5471	20.3209	19.2136	18.2164	17.3154
170.0	33.1723	32.4366	31.6992	29.8669	28.0795	26.3711	24.7707	23.2959	21.9464	20.7190	19.6074	18.6042	17.6952
175.0	33.4215	32.6989	31.9742	30.1734	28.4141	26.7281	25.1439	23.6790	22.3338	21.1061	19.9911	18.9828	18.0667
180.0	33.6631	32.9527	32.2403	30.4693	28.7368	27.0728	25.5046	24.0501	22.7098	21.4828	20.3652	19.3526	18.4302
185.0	33.8975	33.1989	32.4980	30.7554	29.0487	27.4059	25.8537	24.4097	23.0750	21.8493	20.7301	19.7138	18.7859
190.0	34.1253	33.4377	32.7478	31.0323	29.3504	27.7282	26.1919	24.7586	23.4298	22.2063	21.0859	20.0668	19.1340
195.0	34.3468	33.6698	32.9904	31.3007	29.6424	28.0404	26.5197	25.0972	23.7748	22.5539	21.4332	20.4117	19.4747
200.0	34.5624	33.8955	33.2261	31.5610	29.9256	28.3430	26.8377	25.4260	24.1105	22.8927	21.7721	20.7489	19.8083
210.0	34.9774	34.3293	33.6785	32.0594	30.4670	28.9216	27.4464	26.0565	24.7553	23.5453	22.4264	21.4010	20.4549
220.0	35.3726	34.7418	34.1081	32.5312	30.9785	29.4682	28.0219	26.6535	25.3674	24.1665	23.0512	22.0251	21.0753
230.0	35.7502	35.1351	34.5172	32.9791	31.4632	29.9860	28.5675	27.2203	25.9497	24.7591	23.6486	22.6230	21.6712
240.0	36.1117	35.5113	34.9080	33.4057	31.9241	30.4780	29.0861	27.7596	26.5047	25.3251	24.2207	23.1965	22.2440
250.0	36.4588	35.8719	35.2822	33.8131	32.3634	30.9467	29.5802	28.2738	27.0347	25.8666	24.7690	23.7473	22.7952
260.0	36.7927	36.2183	35.6413	34.2032	32.7833	31.3941	30.0519	28.7652	27.5417	26.3854	25.2954	24.2768	23.3261
270.0	37.1146	36.5518	35.9867	34.5775	33.1854	31.8224	30.5032	29.2356	28.0275	26.8831	25.8012	24.7865	23.8380
280.0	37.4254	36.8734	36.3195	34.9375	33.5715	32.2330	30.9358	29.6867	28.4938	27.3611	26.2878	25.2776	24.3320
290.0	37.7260	37.1842	36.6409	35.2844	33.9428	32.6275	31.3512	30.1202	28.9420	27.8208	26.7563	25.7514	24.8091
300.0	38.0171	37.4848	36.9515	35.6192	34.3007	33.0073	31.7507	30.5372	29.3734	28.2634	27.2079	26.2089	25.2704
310.0	38.2995	37.7761	37.2524	35.9430	34.6462	33.3733	32.1355	30.9392	29.7893	28.6899	27.6435	26.6511	25.7168
320.0	38.5738	38.0587	37.5441	36.2565	34.9803	33.7268	32.5067	31.3270	30.1906	29.1013	28.0640	27.0790	26.1492
330.0	38.8404	38.3332	37.8273	36.5607	35.3039	34.0686	32.8652	31.7019	30.5785	29.4985	28.4702	27.4934	26.5684
340.0	39.1000	38.6002	38.1027	36.8561	35.6178	34.3996	33.2120	32.0646	30.9537	29.8823	28.8629	27.8951	26.9751
350.0	39.3529	38.8601	38.3706	37.1433	35.9227	34.7206	33.5477	32.4159	31.3170	30.2534	29.2428	28.2849	27.3699

The self-consistency of a thermodynamic network is under investigation, using numerical methods of computation with the present data in conjunction with spectroscopic [1] and calorimetric [20, 21] specific heats.

Thomas R. Strobridge kindly gave to us his computer program [22] of the least-squares method of William B. Jones [19]. Among present authors, the preparation, examination, and interpolation of isotherm polynomials was carried through by L. A. Weber and H. M. Roder. R. J. Corruccini and R. B. Scott have given encouragement throughout this lengthy investigation.

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