4d. Compressibility

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4d-1. Compressibilities below 250 Kilobars.[3] The data on the compressibility of solids are widely scattered through the scientific literature. Further, these data are given at various pressure intervals and for various pressure units. Bridgman normally published work in units of kilograms per square centimeter, whereas most modern high-pressure data are published in units of bars or kilobars. Bridgman further examined the compressibility of some substances a number of different times with substantially differing results. Data at the upper end of one pressure range determined with one kind of apparatus do not overlap well with data in another pressure range determined with another kind of apparatus. A large fraction, if not most, of the available data on compressibility of solids, liquids, and gases, where data extends to 10 kb and beyond, has been extracted from the technical literature. All this has been plotted. Where data are in conflict, we have plotted the various results and attempted to fit the best smooth curves through them. From these curves we have read off points and tabulated the results: pressure P in kilobars, and relative volume, the ratio of the volume V to the volume V_0 at standard conditions. Many of the results in the following tables are interpolations and smoothed values, so that the tabulated results are not identical in many cases to those found in the source material. A substantial amount of judgment in selection of data has had to be used.

In addition, a large amount of data has recently become available from the extensive program of shock-wave research carried out at Los Alamos Laboratory, Lawrence Radiation Laboratory, and various foreign laboratories. Dr. R. N. Keeler has reduced the shock-wave data for a number of selected substances and presented them as a separate set of tables in a following section.

The reduction of data from shock-wave experiments is crucially dependent on assumptions of an equation of state. Consequently, these assumptions are set out by R. N. Keeler. It should be emphasized that the assumptions used in the reduction of these data differ from those used by a number of other laboratories. For a number of substances, specifically for such substances as indium and calcium, the shock-wave results are quite different from the static compression results. Where conflicts occur, the shock-wave results are to be preferred.

References are given by number after the table titles or underneath the column heads. Temperatures are 25°C, unless otherwise marked.

[1] Compressibilities below 250 kilobars.
[2] High-pressure compressibilities.
[3] *Univ. Calif. (Los Angeles) Inst. Geophys. and Planetary Phys. Publ.* 732.

TABLE 4d-1. V/V_0 OF ELEMENTS*

P, kilobars	H_2 at 30°C [1]	H_2 at 65°C [1]	He at 65°C [1]	N_2 at 23.5°C [7]	N_2 at 65°C [1]	Ar at 25°C [11]	Ar at 55°C [7]
1	.....	.....	....	....	....	1.06	
2	13.89	.....	....	....	....	0.85	0.88
3	11.55	12.17	5.54	1.24	1.29	0.77	0.80
4	10.52	11.04	4.76	1.16	1.20	0.73	0.75
5	9.81	10.29	4.31	1.11	1.14	0.69	0.71
6	9.29	9.72	4.00	1.06	1.09	....	0.68
7	8.87	9.29	3.74	....	1.06	....	0.66
8	8.55	8.97	3.58	....	1.03	....	0.64
9	8.25	9.71	3.44	....	1.00	....	0.63
10	8.01	8.49	3.31	....	0.98	....	0.62
11	7.78	8.29	3.21	....	0.96	....	0.61
12	7.54	8.13	3.12	....	0.95	....	0.60
13	7.32	7.95	3.04	....	0.93	....	0.59
14	.....	.....	2.98	....	0.92	....	0.58
15	.....	.....	2.92	....	0.91	....	0.57

* For references see p. 4-96.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	Ag [13]	Al [2]	As [2]	Au [13]	Ba [12]	Be 5]	Bi at 25°C [12]	Bi at −78.5°C [10]	C (graphite) [6, 12]	Ca [12]	Cd [12]	Ce [2, 5]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.995	0.993	0.988	0.997	0.955	0.996	0.985	0.985	0.984	0.968	0.987	0.976
10	0.990	0.986	0.977	0.994	0.908	0.991	0.971	0.972	0.972	0.942	0.977	0.953
												f
15	0.986	0.980	0.967	0.990	0.872	0.987	0.959	0.960	0.962	0.917	0.966	0.835
20	0.981	0.974	0.960	0.988	0.865	0.982	0.948	0.948	0.954	0.896	0.957	0.813
							b					
25	0.977	0.969	0.952	0.985	0.813	0.978	0.848	0.937	0.946	0.877	0.947	0.798
								d				
30	0.972	0.964	0.945	0.983	0.788	0.975	0.840	0.843	0.939	0.860	0.938	0.787
35	.....	0.960	0.938	.....	0.765	0.971	0.833	0.839	0.933	0.844	0.930	0.777
40	.....	0.955	0.933	.....	0.744	0.967	0.825	0.835	0.927	0.829	0.922	0.769
45	.....	0.951	0.926	.....	0.725	0.965	0.814	0.826	0.923	0.815	0.915	0.762
50	.....	0.947	0.920	.....	0.707	0.963	0.807	0.823	0.917	0.801	0.907	0.755
55	.....	0.943	0.915	.....	0.691	0.960	0.800	.....	0.913	0.788	0.900	0.699
					a							
60	.....	0.938	0.910	.....	0.658	0.958	0.794	.....	0.908	0.778	0.895	0.693
65	.....	0.935	0.906	.....	0.647	0.956	0.781	.....	0.905	*e*	0.887	0.687
70	.....	0.932	0.902	.....	0.636	0.953	0.776	.....	0.901	0.745	0.883	0.682
75	.....	0.929	0.897	.....	0.625	0.951	0.771	.....	0.897	0.737	0.876	0.676
80	.....	0.927	0.895	.....	0.615	0.949	0.766	.....	0.895	0.728	0.871	0.671
85	.....	0.923	0.892	.....	0.605	0.947	0.762	.....	0.891	0.722	0.866	0.667
							c					
90	.....	0.920	0.888	.....	0.595	0.945	0.746	.....	0.889	0.713	0.860	0.663
95	.....	0.917	0.886	.....	0.586	0.944	0.742	.....	0.887	0.706	0.856	0.660
100	.....	0.914	0.883	.....	0.576	0.943	0.737	.....	0.884	0.699	0.851	0.657

* For references see p. 4-96.

[a] Transition at 55.5 kb; volumes 0.682 and 0.633.

[b] Two transitions at 25.4 and 27.0: extreme volumes 0.936 and 0.850.

[c] Transition at 77.5; volumes 0.760 and 0.748.

[d] At 27.7 the volumes are 0.931 and 0.846.

[e] Transition at 62.7; volumes 0.771 and 0.758.

[f] Transition at 12.2; volumes 0.926 and 0.850.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	Co [13]	Cs at 25°C [2, 5]	Cs at 50°C (solid) [15]	Cs at 75°C (liquid) [15]	Cu 13]	Dy [17]	Er [17]	Fm [13]	Ge [2, 13]	Gd [17]	Hg [19]	Ho [17]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.997	0.840	0.813	0.810	0.996	0.986	0.987	0.997	0.992	0.987	0.981	0.987
10	0.994	0.756	0.727	.....	0.993	0.974	0.976	0.994	0.985	0.974	0.966	0.975
15	0.991	0.700	0.672	.....	0.989	0.963	0.965	0.991	0.980	0.963	.....	0.965
20	0.989	0.650	.....	.....	0.985	0.953	0.955	0.989	0.975	0.953	.....	0.955
		[g]										
25	0.987	0.606	.....	.....	0.982	0.943	0.946	0.987	0.970	0.943	.....	0.945
30	0.984	0.570	.....	.....	0.979	0.934	0.937	0.986	0.965	0.935	.....	0.936
35	.....	0.542	.....	.....	.....	0.925	0.928	.....	0.960	0.927	.....	0.928
40	.....	0.519	.....	.....	.....	0.917	0.921	.....	0.956	0.920	.....	0.919
		[h]										
45	.....	0.445	.....	.....	.....	.....	.....	.....	0.951			
50	.....	0.428	.....	.....	.....	.....	.....	.....	0.947			
55	.....	0.415	.....	.....	.....	.....	.....	.....	0.943			
60	.....	0.405	.....	.....	.....	.....	.....	.....	0.940			
65	.....	0.397	.....	.....	.....	.....	.....	.....	0.937			
70	.....	0.390	.....	.....	.....	.....	.....	.....	0.934			
75	.....	0.385	.....	.....	.....	.....	.....	.....	0.930			
80	.....	0.380	.....	.....	.....	.....	.....	.....	0.927			
85	.....	0.375	.....	.....	.....	.....	.....	.....	0.924			
90	.....	0.372	.....	.....	.....	.....	.....	.....	0.921			
95	.....	0.370	.....	.....	.....	.....	.....	.....	0.919			
100	.....	0.368	.....	.....	.....	.....	.....	.....	0.917			

* For references see p. 4-96.
[g] Transition at 22.6; volumes 0.628 and 0.622.
[h] Discontinuity of volume at 44.7.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	In at 25°C [9]	In at −78.5°C [10]	Ir [13]	K [2]	La [2, 5]	Li [2]	Lu [17]	Mg [2]	Mn [2]	Mo [13]	Na [2]	Nb [13]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.987	0.987	0.998	0.875	0.980	0.962	0.988	0.987	0.990	0.997	0.931	0.996
10	0.975	0.975	0.997	0.810	0.963	0.938	0.976	0.975	0.982	0.995	0.883	0.993
15	0.965	0.965	0.995	0.759	0.947	0.899	0.965	0.963	0.974	0.993	0.846	0.990
20	0.955	0.955	0.994	0.720	0.931	0.873	0.955	0.952	0.967	0.991	0.825	0.988
					i							
25	0.946	0.946	0.992	0.689	0.915	0.850	0.946	0.942	0.961	0.990	0.788	0.985
30	0.937	0.937	0.991	0.663	0.903	0.831	0.938	0.933	0.955	0.989	0.767	0.983
35	0.928	0.930	.....	0.641	0.890	0.815	0.930	0.926	0.950	.....	0.749	
40	0.920	0.923	.....	0.622	0.880	0.798	0.922	0.917	0.946	.....	0.734	
45	0.912	0.917	.....	0.605	0.870	0.783	.....	0.910	0.942	.....	0.718	
50	0.904	0.910	.....	0.591	0.861	0.769	.....	0.902	0.938	.....	0.705	
55	0.896	.....	.....	0.578	0.852	0.757	.....	0.895	0.935	.....	0.692	
60	0.890	.....	.....	0.565	0.844	0.745	.....	0.887	0.932	.....	0.680	
65	0.882	.....	.....	0.554	0.836	0.732	.....	0.881	0.929	.....	0.670	
70	0.876	.....	.....	0.543	0.828	0.722	.....	0.875	0.926	.....	0.658	
75	0.870	.....	.....	0.534	0.821	0.711	.....	0.869	0.923	.....	0.648	
80	0.865	.....	.....	0.525	0.815	0.700	.....	0.864	0.921	.....	0.637	
85	0.859	.....	.....	0.518	0.810	0.692	.....	0.858	0.919	.....	0.627	
90	0.854	.....	.....	0.511	0.806	0.684	.....	0.854	0.917	.....	0.620	
95	0.845	.....	.....	0.505	0.802	0.676	.....	0.850	0.916	.....	0.610	
100	0.840	.....	.....	0.499	0.798	0.669	.....	0.845	0.915	.....	0.602	

* For references see p. 4-96.

i Transition at 22.9; volumes 0.924 and 0.922.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	Nd [2]	Ni [13]	P (red) [8]	P (black) [2]	P (violet) [2]	Pb 25°C [9]	Pb at 75°C [16]	Pd [13]	Pr [2]	Pt [13]	Pu [20]	Rb at 25°C [5]	Rb at 50°C [15]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.984	0.997	0.977	0.984	0.977	0.988	0.988	0.997	0.982	0.998	0.991	0.877	0.840
10	0.970	0.994	0.958	0.970	0.955	0.977	0.976	0.994	0.965	0.995	0.983	0.805	0.765
15	0.958	0.991	.....	0.957	0.935	0.966	0.965	0.992	0.950	0.993	0.975	0.753	0.718
20	0.946	0.988	.....	0.946	0.917	0.957	0.955	0.988	0.937	0.992	0.968	0.710	
25	0.936	0.986	.....	0.935	0.899	0.948	0.945	0.986	0.925	0.990	0.961	0.675	
30	0.925	0.984	.....	0.926	0.883	0.940	0.935	0.984	0.915	0.899	0.955	0.648	
35	0.915	.....	.....	0.917	0.867	0.932	.....	.....	0.905	.....	0.949	0.626	
40	0.906	.....	.....	0.911	0.852	0.924	.....	.....	0.895	.....	0.943	0.607	
45	0.896	.....	.....	0.904	0.837	0.915	.....	.....	0.885	.....	0.938	0.591	
				j									
50	0.887	.....	.....	0.848	0.826	0.908	.....	.....	0.876	.....	0.933	0.575	
55	0.879	.....	.....	0.841	0.815	0.901	.....	.....	0.864	.....	0.929	0.561	
60	0.871	.....	.....	0.835	0.807	0.899	.....	.....	0.861	.....	0.924	0.548	
65	0.863	.....	.....	0.929	0.799	0.889	.....	.....	0.853	.....	0.920	0.536	
70	0.856	.....	.....	0.824	0.791	0.883	.....	.....	0.846	.....	0.915	0.525	
75	0.848	.....	.....	0.818	0.784	0.877	.....	.....	0.840	.....	0.911	0.515	
80	0.842	.....	.....	0.814	0.777	0.872	.....	.....	0.834	.....	0.907	0.505	
					k								
85	0.836	.....	.....	0.810	0.668	0.867	.....	.....	0.826	.....	0.904	0.496	
90	0.830	.....	.....	0.806	0.665	0.862	.....	.....	0.820	.....	0.901	0.487	
95	0.825	.....	.....	0.802	0.662	0.857	.....	.....	0.815	.....	0.989	0.477	
100	0.820	.....	.....	0.797	0.659	0.852	.....	.....	0.808	.....	0.987	0.470	

* For references see p. 4-96.
j Reversible transition in this region.
k Irreversible transition at 83.3 from violet to black; volumes 0.773 and 0.670.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	Rh [13]	Ru [13]	S at 25°C [9]	S at −78.5°C [10]	Sb at 25°C [12]	Sb at −78.5°C [10]	Se at 25°C [12]	Se at −78.5°C [10]	Si [2]	Sm [17]	Sm [12]	Ta [13]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.997	0.998	0.950	0.958	0.986	0.987	0.945	0.952	0.995	0.982	0.991	0.996
10	0.995	0.996	0.915	0.925	0.975	0.976	0.907	0.915	0.990	0.966	0.982	0.994
15	0.993	0.994	0.888	0.900	0.963	0.965	0.876	0.885	0.985	0.953	0.973	0.992
20	0.991	0.992	0.869	0.881	0.953	0.956	0.850	0.860	0.981	0.940	0.965	0.990
25	0.990	0.991	0.851	0.864	0.943	0.946	0.830	0.839	0.977	0.928	0.958	0.988
30	0.989	0.989	0.837	0.850	0.934	0.937	0.813	0.825	0.975	0.915	0.950	0.981
35	.....	.....	0.822	0.839	0.925	0.928	0.798	0.811	0.971	0.910	0.942	
40	.....	.....	0.810	0.831	0.916	0.920	0.786	0.800	0.967	0.894	0.935	
45	.....	.....	0.800	0.825	0.908	0.913	0.776	0.791	0.964	.....	0.928	
50	.....	.....	0.791	0.821	0.900	0.905	0.767	.....	0.960	.....	0.921	
55	.....	.....	0.782	.....	0.894	.....	0.760	.....	0.957	.....	0.915	
60	.....	.....	0.774	.....	0.887	.....	0.751	.....	0.955	.....	0.908	
65	.....	.....	0.766	.....	0.880	.....	0.745	.....	0.953	.....	0.902	
70	.....	.....	0.758	.....	0.875	.....	0.738	.....	0.950	.....	0.895	
75	.....	.....	0.752	.....	0.869	.....	0.731	.....	0.948	.....	0.890	
80	.....	.....	0.745	.....	0.865	.....	0.725	.....	0.946	.....	0.884	
					[l]							
85	.....	.....	0.740	.....	0.816	.....	0.719	.....	0.945	.....	0.878	
90	.....	.....	0.735	.....	0.815	.....	0.714	.....	0.943	.....	0.822	
95	.....	.....	0.730	.....	0.814	.....	0.708	.....	0.942	.....	0.816	
100	.....	.....	0.725	.....	0.813	.....	0.702	.....	0.941	.....	0.810	

* For references see p. 4-96.

[l] Transition at 83.3; volumes 0.858 and 0.821.

TABLE 4d-1. V/V_0 OF ELEMENTS (*Continued*)

P, kilobars	Te at 25°C [12]	Te at −78.5°C [10, 13]	Th [2]	Ti [2, 13]	Tl [12]	Tm [17]	U [2]	U [13]	Y [16]	Yb [17]	Zn [12]	Zr [2]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.975	0.976	0.990	0.994	0.987	0.987	0.995	0.998	0.986	0.962	0.992	0.994
10	0.955	0.958	0.981	0.989	0.975	0.975	0.990	0.996	0.973	0.928	0.988	0.987
15	0.930	0.942	0.972	0.985	0.965	0.965	0.985	0.994	0.961	0.889	0.975	0.982
20	0.918	0.928	0.963	0.980	0.955	0.955	0.981	0.993	0.950	0.874	0.967	0.975
25	0.902	0.915	0.955	0.977	0.946	0.946	0.976	0.992	0.940	0.852	0.960	0.970
30	0.888	0.903	0.947	0.973	0.937	0.937	0.973	0.991	0.930	0.832	0.952	0.965
35	0.876	0.892	0.940	0.968	0.929	0.928	0.969	.....	0.921	0.814	0.944	0.959
40	0.865	0.882	0.932	0.965	[p] 0.911	0.921	0.966	.....	0.913	0.797	0.937	0.954
45	[m] 0.791	[o] 0.873	0.926	0.962	0.903	.....	0.933	.....	.....	.....	0.930	0.950
50	0.785	0.869	0.920	0.958	0.895	.....	0.930	.....	.....	.....	0.923	0.945
55	0.779	.....	0.916	0.955	0.887	.....	0.957	.....	.....	.....	0.917	0.940
60	0.774	.....	0.911	0.953	0.880	.....	0.955	.....	.....	.....	0.910	0.935
65	0.770	.....	0.907	0.950	0.872	.....	0.952	.....	.....	.....	0.904	0.931
70	[n] 0.760	.....	0.903	0.947	0.865	.....	0.950	.....	.....	.....	0.897	0.927
75	0.754	.....	0.900	0.945	0.859	.....	0.948	.....	.....	.....	0.891	0.924
80	0.748	.....	0.896	0.944	0.852	.....	0.945	.....	.....	.....	0.886	0.920
85	0.744	.....	0.894	0.942	0.846	.....	0.944	.....	.....	.....	0.881	0.917
90	0.740	.....	0.890	0.940	0.840	.....	0.943	.....	.....	.....	0.876	0.915
95	0.735	.....	0.888	0.938	0.834	.....	0.942	.....	.....	.....	0.872	0.912
100	0.739	.....	0.885	0.936	0.829	.....	0.941	.....	.....	.....	0.867	0.909

* For references see p. 4-96.
[m] Transition at 40.1; volumes 0.848 and 0.893.
[n] Transition at 68.6; volumes 0.766 and 0.759.
[o] Transition at 40.3; volumes 0.881 to 0.837.
[p] Transition at 36.7; volumes 0.921 and 0.914.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS*

P, kilobars	AgBr at 25°C [9]	AgBr at −78.5°C [10]	$AgBrO_3$ [9]	AgCl at 25°C [9]	AgCl at −78.5°C [10]	AgCN [5]	AgI at 25°C [9]	AgI at −78.5°C [10]	$AgNO_3$ [9]	BaS at 25°C [10]	BaS at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
							c	*d*			
5	0.989	0.989	0.985	0.990	0.990	0.955	0.820	0.822	0.983	0.985	0.985
									e		
10	0.987	0.978	0.972	0.979	0.979	0.922	0.810	0.812	0.955	0.974	0.974
15	0.968	0.968	0.959	0.969	0.970	0.895	0.800	0.802	0.937	0.963	0.963
20	0.959	0.960	0.947	0.959	0.961	0.873	0.790	0.793	0.921	0.953	0.954
25	0.950	0.951	0.937	0.950	0.953	0.854	0.779	0.785	0.907	0.945	0.945
30	0.941	0.943	0.928	0.941	0.945	0.787	0.770	0.776	0.895	0.937	0.937
35	0.932	0.935	0.919	0.933	0.937	0.772	0.761	0.769	0.883	0.930	0.931
40	0.923	0.927	0.910	0.924	0.930	0.760	0.752	0.762	0.872	0.924	0.925
45	0.915	0.920	0.902	0.915	0.923	.....	0.743	0.756	0.862	0.918	0.920
50	0.906	0.913	0.895	0.907	0.917	.....	0.735	0.750	0.852	0.912	0.914
55	0.899	.....	0.888	0.900	.....	.....	0.727	.....	0.843		
60	0.892	.....	0.881	0.893	.....	.....	0.720	.....	0.835		
65	0.885	.....	0.875	0.887	.....	.....	0.713	.....	0.828		
70	0.880	.....	0.870	0.880	.....	.....	0.706	.....	0.822		
75	0.875	.....	0.865	0.874	.....	.....	0.700	.....	0.816		
80	0.870	.....	0.860	0.868	.....	.....	0.693	.....	0.810		
	a										
85	0.847	.....	0.856	0.863	.....	.....	0.687	.....	0.805		
				b							
90	0.841	.....	0.852	0.743	.....	.....	0.681	.....	0.800		
95	0.835	.....	0.848	0.737	.....	.....	0.675	.....	0.796		
100	0.829	.....	0.845	0.732	.....	.....	0.670	.....	0.792		

* For references see p. 4-96.

[a] Transition at 84.3; volumes 0.859 and 0.848.

[b] Transition at 88.2; volumes 0.860 and 0.744.

[c] Transition at 2.9 kb; volumes 0.989 ± 2.9 and 0.826.

[d] Transition in this region.

[e] Transition at 9.3; volumes 0.970 and 0.957.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS (*Continued*)

P, kilobars	BaSe at 25°C [10]	BaSe at −78.5°C [10]	BaTe at 25°C [10]	BaTe at −78.5°C [10]	CaS at 25°C [10]	CaS at −78.5°C [10]	CaSe at 25°C [10]	CaSe at −78.5°C [10]	CaTe at 25°C [10]	CaTe at −78.5°C [10]	CsBr at 25°C [9]	CsBr at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.985	0.987	0.983	0.985	0.987	0.988	0.990	0.991	0.988	0.989	0.972	0.973
10	0.974	0.976	0.969	0.973	0.975	0.978	0.980	0.982	0.978	0.980	0.947	0.948
15	0.964	0.967	0.957	0.962	0.966	0.969	0.972	0.974	0.969	0.971	0.924	0.926
20	0.954	0.958	0.945	0.951	0.957	0.961	0.964	0.967	0.961	0.963	0.904	0.907
25	0.945	0.950	0.935	0.943	0.949	0.955	0.956	0.960	0.953	0.956	0.885	0.890
30	0.937	0.948	0.927	0.935	0.943	0.948	0.950	0.954	0.947	0.950	0.868	0.875
35	0.930	0.936	0.918	0.929	0.937	0.943	0.943	0.949	0.940	0.943	0.851	0.862
40	0.923	0.930	0.909	0.923	0.932	0.938	0.938	0.945	0.934	0.937	0.837	0.850
45	0.916	0.925	0.901	0.916	0.929	0.934	0.932	0.939	0.928	0.932	0.823	0.839
50	0.910	0.920	.....	.....	0.925	0.930	0.927	0.935	0.922	0.926	0.810	0.830
			f	*f*								
55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.799	
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.789	
65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.780	
70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.770	
75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.762	
80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.753	
85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.746	
90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.738	
95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.731	
100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.724	

* For references, see p. 4-96.
f Transition at 49.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	CsCl at 25°C [9]	CsCl at −78.5°C [10]	$CsClO_3$ [6]	$CsClO_4$ [6]	CsI at 25°C [9]	CsI at −78.5°C [10]	$CsMnO_4$ [5]	$CsNO_3$ [9]	CuBr [5]	CuI [5]	HgS at 25°C [2]	HgS at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.975	0.975	0.974	0.976	0.964	0.966	0.973	0.975	0.986	0.985	0.977	0.977
10	0.952	0.953	0.950	0.956	0.934	0.938	0.950	0.953	0.975	0.975	0.958	0.960
										[g]		
15	0.930	0.935	0.931	0.940	0.907	0.914	0.905	0.933	.....	0.928	0.944	0.946
20	0.913	0.918	0.915	0.924	0.884	0.892	0.889	0.914	.....	0.915	0.934	0.935
25	0.895	0.902	0.903	0.910	0.865	0.872	0.874	0.897	.....	0.903	0.926	0.928
30	0.880	0.888	.....	.....	0.848	0.855	0.860	0.883	.....	0.892	0.920	0.922
35	0.867	0.876	.....	.....	0.832	0.839	0.846	0.869	.....	0.882	0.916	0.918
40	0.855	0.865	.....	.....	0.816	0.826	0.834	0.856	.....	0.872	0.912	0.914
45	0.844	0.855	.....	.....	0.802	0.815	.....	0.845	.....	.....	0.910	0.911
50	0.833	0.847	.....	.....	0.790	0.805	.....	0.833	.....	.....	0.907	0.907
55	0.823	.....	.....	.....	0.778	.....	.....	0.824	.....	.....	0.904	0.903
60	0.814	.....	.....	.....	0.767	.....	.....	0.815	.....	.....	0.901	0.900
65	0.805	.....	.....	.....	0.757	.....	.....	0.808	.....	.....	0.898	
70	0.798	.....	.....	.....	0.747	.....	.....	0.801	.....	.....	0.896	
75	0.791	.....	.....	.....	0.738	.....	.....	0.795	.....	.....	0.894	
80	0.785	.....	.....	.....	0.730	.....	.....	0.789	.....	.....	0.891	
85	0.780	.....	.....	.....	0.728	.....	.....	0.784	.....	.....	0.889	
90	0.774	.....	.....	.....	0.717	.....	.....	0.779	.....	.....	0.887	
95	0.769	.....	.....	.....	0.710	.....	.....	0.775	.....	.....	0.885	
100	0.764	.....	.....	.....	0.704	.....	.....	0.771	.....	.....	0.883	

* For references, see p. 4-96.

[g] Transition at 14.1; volumes 0.996 and 0.930.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	HgSe at 25°C [2, 10]	HgSe at −78.5°C [10]	HgTe [2]	HIO_3 [21]	$KAl(SO_4)_2 \cdot 12H_2O$ [5]	$KB_5O_8 \cdot 4H_2O$ [5]	KBr at 25°C [9]	KBr at −78.5°C [10]	KCl at 25°C [9]	KCl at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.991	0.991	0.948	0.978	0.970	0.923 [k]	0.970	0.973	0.974	0.976
10	0.888 [h]	0.890 [j]	0.917	0.959	0.947	0.900	0.944	0.948	0.951	0.955
15	0.872 [i]	0.872 [i]	0.896	0.943	0.929	0.880 [l]	0.923 [m]	0.926 [n]	0.932	0.93 [p]
20	0.862	0.861	0.881	0.927	0.912	0.856	0.800	0.804	0.915 [o]	0.918
25	0.852	0.851	0.868	0.915	0.897	0.844	0.785	0.790	0.787	0.793
30	0.843	0.842	0.808	0.903	0.883	0.832	0.770	0.778	0.775	0.782
35	0.834	0.834	0.800	.....	0.870	0.821	0.757	0.767	0.764	0.773
40	0.827	0.828	0.792	.....	0.858	0.811	0.745	0.757	0.754	0.765
45	0.820	0.822	0.785	.....	.....	.....	0.739	0.750	0.745	0.758
50	0.813	0.817	0.778	.....	.....	.....	0.724	0.742	0.737	p.750
55	0.808	.....	0.771	.....	.....	.....	0.715	.....	0.729	
60	0.803	.....	0.761	.....	.....	.....	0.707	.....	0.722	
65	0.798	.....	0.758	.....	.....	.....	0.699	.....	0.715	
70	0.794	.....	0.751	.....	.....	.....	0.693	.....	0.708	
75	0.790	.....	0.745	.....	.....	.....	0.686	.....	0.702	
80	0.786	.....	0.739	.....	.....	.....	0.681	.....	0.697	
85	0.784	.....	0.732	.....	.....	.....	0.675	.....	0.691	
90	0.782	.....	0.726	.....	.....	.....	0.671	.....	0.687	
95	0.779	.....	0.720	.....	.....	.....	0.667	.....	0.682	
100	0.777	.....	0.714	.....	.....	.....	0.663	.....	0.678	

* For references, see p. 4-96.
[h] Volume at 6.9 = 0.987 and at 7.1 = 0.891.
[i] Volume at 10.7 = 0.8.
[j] Volume at 7.1 = 0.9.
[k] Transition at 3.5; volumes 0.979 and 0.934.
[l] Transition at 19.9; volumes 0.865 and 0.859.
[m] Transition at 18.0; volumes 0.912 ad 0.807.
[n] Transition in this region.
[o] Transition at 19.7; volumes 0.915 and 0.803.
[p] Transition in this region.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	$KClO_3$ [6]	$KClO_4$ [6]	KCN [5]	KI at 25°C [9]	KI at −78.5°C [10]	KIO_3 [6]	KIO_4 [6]	$KNaC_4H_4O_5$ [21]	KNO_3 [9]	KPO_3 [21]	$LiClO_4$ [6]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.973 [q]	0.978	0.970	0.965	0.967	0.984	0.990	0.975	0.877 [u]	0.983	0.980
10	0.944	0.959	0.945	0.935	0.937	0.970	0.981	0.953	0.861	0.967	0.964
15	0.927	0.942	0.921 [r]	0.907 [s]	0.912 [t]	0.958	0.972	0.935	0.845	0.954	0.948 [v]
20	0.912	0.926	0.807	0.802	0.805	0.947	0.964	0.919	0.830	0.941	0.918
25	0.898	.....	0.795	0.785	0.789	0.938	0.955	0.905	0.817	0.930	0.907
30	.....	.....	0.783	0.770	0.774	.....	0.948	0.894	0.803	0.920	
35	.....	.....	0.775	0.756	0.760	.....	0.940	.....	0.791		
40	.....	.....	0.768	0.743	0.746	.....	.....	.....	0.780		
45	.....	.....	.....	0.730	0.733	.....	.....	.....	0.770		
50	.....	.....	.....	0.718	0.722	.....	.....	.....	0.761		
55	.....	.....	.....	0.708	.....	.....	.....	.....	0.752		
60	.....	.....	.....	0.698	.....	.....	.....	.....	0.745		
65	.....	.....	.....	0.690	.....	.....	.....	.....	0.737		
70	.....	.....	.....	0.682	.....	.....	.....	.....	0.730		
75	.....	.....	.....	0.676	.....	.....	.....	.....	0.724		
80	.....	.....	.....	0.670	.....	.....	.....	.....	0.719		
85	.....	.....	.....	0.665	.....	.....	.....	.....	0.714		
90	.....	.....	.....	0.660	.....	.....	.....	.....	0.710		
95	.....	.....	.....	0.655	.....	.....	.....	.....	0.705		
100	.....	.....	.....	0.650	.....	.....	.....	.....	0.700		

* For references, see p. 4-96.
[q] Transition at 7.5; volumes 0.961 and 0.906.
[r] Transition at 19.9; volumes 0.899 and 0.811.
[s] Transition at 17.8; volumes 0.895 and 0.810.
[t] Transition in this region.
[u] Transition at 3.6; volumes 0.977 and 0.887.
[v] Transition at 16.1; volumes 0.944 and 0.928.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	$LiNaCr_2O_7$ [21]	$MgSO_4$ [5]	NaBr at 25°C [9]	NaBr at −78.5°C [10]	$NaBrO_3$ [6]	NaCl at 25°C [9]	NaCl at −78.5°C [10]	$NaClO_3$ [5]	$NaClO_4$ [6]	NaI at 25°C [9]	NaI at −78.5°C [10]	$NaIO_3$ [6]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.982	0.975	0.978	0.980	0.983	0.980	0.982	0.981	0.979	0.970	0.970	0.983
		w										
10	0.965	0.954	0.953	0.959	0.967	0.962	0.966	0.964	0.961	0.944	0.944	0.968
15	0.951	0.915	0.937	0.940	0.954	0.947	0.950	0.949	0.946	0.922	0.922	0.955
20	0.038	0.900	0.969	0.923	0.942	0.932	0.935	0.936	0.933	0.902	0.903	0.943
		x										
25	0.925	0.856	0.954	0.957	0.931	0.919	0.922	0.923	0.921	0.883	0.885	0.932
30	0.917	0.845	0.940	0.944	.....	0.907	0.911	0.913	.....	0.866	0.870	
35	.....	0.834	0.927	0.932	.....	0.895	0.900	0.902	.....	0.851	0.857	
40	.....	0.824	0.916	0.922	.....	0.884	0.890	0.894	.....	0.837	0.844	
45	.....	.....	0.905	0.912	.....	0.874	0.881	.....	.....	0.825	0.834	
50	.....	.....	0.895	0.905	.....	0.864	0.873	.....	.....	0.813	0.825	
55	.....	.....	0.886	.....	.....	0.855	.....	.....	.....	0.802		
60	.....	.....	0.877	.....	.....	0.846	.....	.....	.....	0.792		
65	.....	.....	0.870	.....	.....	0.838	.....	.....	.....	0.783		
70	.....	.....	0.862	.....	.....	0.830	.....	.....	.....	0.774		
75	.....	.....	0.855	.....	.....	0.822	.....	.....	.....	0.766		
80	.....	.....	0.848	.....	.....	0.815	.....	.....	.....	0.758		
85	.....	.....	0.842	.....	.....	0.808	.....	.....	.....	0.751		
90	.....	.....	0.836	.....	.....	0.801	.....	.....	.....	0.745		
95	.....	.....	0.830	.....	.....	0.794	.....	.....	.....	0.739		
100	.....	.....	0.825	.....	.....	0.788	.....	.....	.....	0.733		

* For references, see p. 4-96.

w Very sluggish transition between 9.8 and 14.7.

x Probably two sluggish transitions in neighborhood of 24.5. Volume discontinuity of one about 4 times that of other.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	$NaIO_4$ [6]	$NaNH_4C_4H_4O_6$ [21]	$NaNO_3$ [9]	$NH_4B_5O_8 \cdot 4H_2O$ [5]	NH_4Br at 25°C [9]	NH_4Br at −78.5°C [10]	NH_4CHO_2 [5]	NH_4Cl at 25°C [9]	NH_4Cl at −78.5°C [10]	NH_4IO_4 [6]	NH_4NO_3 [9]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.981	0.974	0.982	0.964	0.973	0.973	0.965	0.973	0.978	0.980	0.972
10	0.966	0.952	0.965	0.938	0.950	0.951	0.932	0.952	0.960	0.963	0.948
							aa				
15	0.953	0.933	0.950	0.917	0.929	0.932	0.805	0.933	0.945	0.946	0.928
20	0.942	0.917	0.937	0.900	0.910	0.915	0.794	0.917	0.931	0.931	0.912
				z							
25	.....	.....	0.912	0.845	0.878	0.885	0.773	0.888	0.906	.....	0.897
30	.....	0.889	0.912	0.845	0.878	0.885	0.773	0.888	0.906	.....	0.882
35	.....	.....	0.901	0.834	0.863	0.873	0.764	0.875	0.895	.....	0.870
40	.....	.....	0.890	0.824	0.850	0.862	0.754	0.864	0.885	.....	0.857
45	.....	.....	0.881	.....	0.838	0.851	.....	0.853	0.875	.....	0.846
50	.....	.....	0.871	.....	0.827	0.842	.....	0.843	0.867	.....	0.835
			y								
55	.....	.....	0.852	.....	0.817	.....	.....	0.835	.....	.....	0.826
60	.....	.....	0.943	.....	0.808	.....	.....	0.826	.....	.....	0.817
65	.....	.....	0.836	.....	0.800	.....	.....	0.818	.....	.....	0.810
70	.....	.....	0.830	.....	0.892	.....	.....	0.810	.....	.....	0.804
75	.....	.....	0.823	.....	0.885	.....	.....	0.803	.....	.....	0.797
80	.....	.....	0.817	.....	0.878	.....	.....	0.796	.....	.....	0.792
85	.....	.....	0.812	.....	0.872	.....	.....	0.790	.....	.....	0.787
90	.....	.....	0.807	.....	0.865	.....	.....	0.783	.....	.....	0.784
95	.....	.....	0.802	.....	0.859	.....	.....	0.776	.....	.....	0.780
100	.....	.....	0.797	.....	0.852	.....	.....	0.769	.....	.....	0.777

* For references, see p. 4-96.
y Transition at 53.9; volumes 0.864 and 0.853.
z Transition at 22.8; volumes 0.892 and 0.868.
aa Transition at 11.2; volumes 0.926 and 0.815.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	NH_4PO_4 [5]	$NiSO_4$ [21]	PbI_2 [5]	NH_2SO_3H [21]	NH_4ClO_4 [6]	$NH_4H_2PO_4$ [21]	NH_4I at 25°C [9]	NH_4I at −78.5°C [10]	NH_4IO_3 [6]	PbS at 25°C [2]	PbS at −78.5°C [10]
0	1.000	1.000	1.000 *bb*	1.000	1.000	1.000	1.000 *cc*	1.000	1.000	1.000	1.000
5	0.981	0.983	0.897	0.979	0.971	0.982	0.832	0.967	0.986	0.983	0.989
10	0.965	0.967	0.878	0.963	0.948	0.966	0.807	0.941	0.973	0.969	0.980
15	0.951	0.953	0.863	0.948	0.927	0.952	0.781	0.920	0.961	0.956	0.971
20	0.939	0.940	0.850	0.935	0.910	0.940	0.767	0.901	0.950	0.945	0.962 *dd*
25	0.877	0.886	0.838	0.923	0.895	0.929	0.754	0.885	0.940	0.935	0.933
30	0.867	0.861	0.827	0.913	.....	0.919	0.740	0.870	.....	0.928	0.925
35	0.857	.....	0.818	.....	.....	.....	0.728	0.858	.....	0.921	0.918
40	0.848	.....	.....	.....	.....	.....	0.716	0.846	.....	0.915	0.913
45	.....	.....	.....	.....	.....	.....	0.705	0.837	.....	0.909	0.909
50	.....	.....	.....	.....	.....	.....	0.695	0.828	.....	0.903	0.905
55	.....	.....	.....	.....	.....	.....	0.686	.....	.....	0.899	
60	.....	.....	.....	.....	.....	.....	0.678	.....	.....	0.896	
65	.....	.....	.....	.....	.....	.....	0.670	.....	.....	0.892	
70	.....	.....	.....	.....	.....	.....	0.662	.....	.....	0.890	
75	.....	.....	.....	.....	.....	.....	0.655	.....	.....	0.887	
80	.....	.....	.....	.....	.....	.....	0.648	.....	.....	0.885	
85	.....	.....	.....	.....	.....	.....	0.642	.....	.....	0.882	
90	.....	.....	.....	.....	.....	.....	0.635	.....	.....	0.880	
95	.....	.....	.....	.....	.....	.....	0.628	.....	.....	0.878	
100	.....	.....	.....	.....	.....	.....	0.622	.....	.....	0.876	

* For references, see p. 4-96.

bb Transition at 5.0; volumes 0.963 and 0.924.

cc Transition at 0.5; volumes 0.997± and 0.856.

dd Volume at 24.2 = 0.958 and at 22.3 = 0.937.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	PbSe at 25°C [2]	PbSe at −78.5°C [10]	PbTe at 25°C [2]	PbTe at −78.5°C [10]	PCl_3 [23]	RbBr at 25°C [9]	RbBr at −78.5°C [10]	$Rb_2C_4H_4O_6$ [21]	RbCl at 25°C [9]	RbCl at −78.5°C [10]	$RbClO_4$ [6]
0	1.000	1.000	1.000	1.000	1.000	1.000 *hh*	1.000 *ii*	1.000	1.000 *jj*	1.000 *kk*	1.000
5	0.983	0.986	0.984	0.985	0.833	0.830	0.830	0.979	0.830	0.831	0.975
10	0.967	0.974	0.970	0.973	0.774	0.811	0.812	0.960	0.811	0.812	0.954
15	0.955	0.962	0.960	0.962	.....	0.794	0.796	0.944	0.795	0 796	0.934
20	0.945	0.951	0.950	0.952		0.777	0.782	0.935	0.780	0 782	0.917
25	0.937	0.941	0.943	0.944	.....	0.762	0.768	0.916	0.765	0 770	0.901
30	0.930	0.931	0.937	0.936	.....	0.748	0.756	0.904	0.752	0 758	
35	0.925	0.924	0.933	0.929	.....	0.735	0.745	.....	0.740	0.748	
40	0.922 *cc*	0.916 *ff*	0.930 *gg*	0.923	.....	0.722	0.736	.....	0.728	0.740	
45	0.892	0.900	0.943	0.917	.....	0.711	0.728	.....	0.717	0.733	
50	0.886	0.892	0.933	0.913	.....	0.701	0.720	.....	0.706	0.726	
55	0.881	.....	0.925	.....	.....	0.692	.....	.....	0.696		
60	0.875	.....	0.916	.....	.....	0.683	.....	.....	0.687		
65	0.870	.....	0.909	.....	.....	0.675	.....	.....	0.678		
70	0.865	.....	0.902	.....	.....	0.668	.....	.....	0.670		
75	0.861	.....	0.895	.....	.....	0.661	.....	.....	0.663		
80	0.856	.....	0.890	.....	.....	0.655	.....	.....	0.657		
85	0.852	.....	0.884	.....	.....	0.650	.....	.....	0.650		
90	0.848	.....	0.879	.....	.....	0.645	.....	.....	0.645		
95	0.843	.....	0.873	.....	.....	0.639	.....	.....	0.640		
100	0.840	.....	0.868	.....	.....	0.634	.....	.....	0.635		

* For references, see p. 4-96.
cc Transition at 44.1; volumes 0.917 and 0.893.
ff Volume at 42.45 = 0.916 and at 42.49 = 0.906.
gg Transition at 44.1; volumes 0.925 and 0.892.
hh Transition at 4.5; volumes 0.967 and 0.834.
ii Transition in this region.
jj Transition at 4.9; volumes 0.970 and 0.830.
kk Transition in this region.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	RbI at 25°C [9]	RbI at −78.5°C [10]	$RbIO_4$ [6]	$RbNO_3$ [9]	$Sr(CHO_2)_2$ [21]	SrS at 25°C [10]	SrS at −78.5°C [10]	SrSe at 25°C [10]	SrSe at −78.5°C [10]	SrTe at 25°C [10]	SrTe at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	ll	*mm*									
5	0.832	0.834	0.978	0.978	0.983	0.984	0.985	0.988	0.988	0.985	0.987
10	0.807	0.811	0.959	0.956	0.966	0.969	0.973	0.978	0.979	0.972	0.976
15	0.783	0.790	0.943	0.937	0.953	0.957	0.963	0.969	0.970	0.960	0.965
20	0.762	0.774	0.930	0.920	0.941	0.948	0.955	0.961	0.962	0.949	0.955
25	0.743	0.759	0.918	0.904	0.931	0.940	0.949	0.953	0.954	0.940	0.946
30	0.725	0.745	0.907	0.889	0.921	0.934	0.944	0.946	0.947	0.931	0.937
35	0.710	0.735	.....	0.875	.....	0.928	0.940	0.939	0.941	0.923	0.929
40	0.695	0.724	.....	0.863	.....	0.924	0.937	0.933	0.935	0.916	0.922
45	0.683	0.715	.....	0.851	.....	0.920	0.934	0.928	0.930	0.908	0.915
50	0.672	0.706	.....	0.841	.....	0.917	0.932	0.923	0.925	0.902	0.909
55	0.661	.....	.....	0.832							
60	0.651	.....	.....	0.823							
65	0.643	.....	.....	0.815							
70	0.635	.....	.....	0.808							
75	0.628	.....	.....	0.802							
80	0.621	.....	.....	0.796							
85	0.615	.....	.....	0.792							
90	0.609	.....	.....	0.787							
95	0.605	.....	.....	0.783							
100	0.600	.....	.....	0.780							

* For references, see p. 4-96.
ll Transition at 4.0; volumes 0.965 and 0.839.
mm Transition in this region.

TABLE 4d-2. V/V_0 OF INORGANIC COMPOUNDS* (*Continued*)

P, kilobars	TlBr at 25°C [9]	TlBr at −78.5°C [10]	TlCl at 25°C [9]	TlCl at −78.5°C [10]	TlI at 25°C [9]	TlI at −78.5°C [10]	$TlNO_3$ [9]	ZnS at 25°C [2]	ZnS at −78.5°C [10]	ZnSe at 25°C [2]	ZnSe at −78.5°C [10]	ZnTe at 25°C [2]	ZnTe at −78.5°C [10]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.978	0.980	0.978	0.980	0.973	0.973	0.980	0.993	0.993	0.988	0.990	0.987	0.988
10	0.957	0.960	0.959	0.962	0.950	0.950	0.962	0.987	0.987	0.977	0.979	0.975	0.978
15	0.939	0.942	0.942	0.946	0.928	0.930	0.945	0.982	0.980	0.968	0.970	0.965	0.968
20	0.922	0.925	0.927	0.933	0.910	0.912	0.930	0.977	0.975	0.960	0.963	0.957	0.959
25	0.906	0.911	0.912	0.920	0.892	0.897	0.917	0.972	0.970	0.953	0.957	0.950	0.950
30	0.892	0.899	0.899	0.909	0.875	0.884	0.903	0.967	0.964	0.949	0.951	0.944	0.943
35	0.878	0.888	0.881	0.899	0.860	0.871	0.891	0.963	0.959	0.947	0.948	0.940	0.935
										nn	*oo*	*pp*	*qq*
40	0.867	0.880	0.875	0.890	0.847	0.860	0.880	0.958	0.954	0.938	0.940	0.932	0.922
45	0.857	0.872	0.864	0.882	0.833	0.850	0.870	0.955	0.949	0.933	0.937	0.925	0.916
50	0.847	0.866	0.854	0.875	0.822	0.841	0.861	0.951	0.945	0.928	0.935	0.920	0.910
55	0.837	.....	0.844	....	0.810	.....	0.853	0.948	....	0.924	.....	0.914	
60	0.829	.....	0.835	....	0.800	.....	0.846	0.945	.....	0.920	.....	0.908	
65	0.821	.....	0.827	....	0.790	.....	0.840	0.942	.....	0.915	.....	0.902	
70	0.813	.....	0.820	....	0.781	....	0.834	0.938	.....	0.910	.....	0.897	
75	0.805	.....	0.813	....	0.773	....	0.828	0.936	.....	0.905	.....	0.892	
80	0.798	.....	0.807	....	0.766	.....	0.823	0.933	.....	0.901	.....	0.886	
85	0.792	.....	0.801	....	0.760	.....	0.818	0.930	.....	0.897	.....	0.881	
90	0.786	.....	0.795	.....	0.753	.....	0.814	0.928	.....	0.893	.....	0.875	
95	0.780	.....	0.790	.....	0.746	.....	0.809	0.926	.....	0.890	.....	0.870	
100	0.774	.....	0.785	.....	0.740	.....	0.805	0.924	.....	0.886	.....	0.866	

* For references, see p. 4-96.
nn Small transition at 37.2.
oo Volume at 37.7 = 0.946 and at 35.6 = 0.944.
pp Small transition here.
qq Transition at 35.3; volumes 0.933 and 0.928.

TABLE 4d-3. V OF H_2O, IN CM^3/G [29]

P, kilobars	Temperature, °C																		
	0	10	20	30	40	50	60	70	80	90	100	200	300	400	500	600	700	800	900	1000
0	1.00013	1.00027	1.00177	1.00434	1.00781	1.01208	1.01706	1.02271	1.02900	1.0359	1.0434	2171.0	2038.6	3102.6	3565.7	4028.	4491.	4951.	5413.	5875.
1	0.9564	0.9589	0.9616	0.9649	0.9687	0.9729	0.9774	0.9824	0.9878	0.9937	0.9999	1.0811	1.2131	1.442	1.892	2.670	3.547	4.406	5.163	5.863
2	0.925	0.928	0.932	0.936	0.940	0.944	0.948	0.953	0.958	0.963	0.968	1.032	1.127	1.260	1.435	1.666	1.980	2.348	2.722	3.097
3	0.900	0.904	0.907	0.911	0.915	0.919	0.924	0.928	0.933	0.938	0.943									
4	0.879	0.883	0.887	0.890	0.894	0.898	0.902	0.906	0.911	0.916	0.921									1.616
5	0.862	0.865	0.869	0.872	0.876	0.880	0.884	0.888	0.893	0.897	0.902	0.944	0.995	1.065	1.139	.....	.....	.....	.....	
6	0.847	0.849	0.853	9.857	0.861	0.865	0.869	0.873	0.877	0.881	0.885									
7	.....	0.835	0.839	0.843	0.847	0.851	0.855	0.859	0.862	0.866	0.870									
8	.....	.....	0.826	0.830	0.834	0.838	0.842	0.846	0.849	0.853	0.857									1.189
9	.....	.....	.....	0.819	0.823	0.827	0.831	0.835	0.838	0.842	0.846	.....	.....	.....	.....	.....	.....	.....	.....	1.040
10	.....	.....	.....	0.809	0.813	0.817	0.821	0.825	0.829	0.833	0.837	0.872	0.907	0.937	0.978	.....	.....	.....	.....	0.959
15	.....	.....	.....	.....	.....	.....	0.780	0.784	0.787	0.791	0.794	0.821	0.846	0.873	0.900	.....	.....	.....	.....	0.914
20	.....	.....	.....	.....	.....	.....	.....	.....	0.757	0.760	0.762	0.783	0.806	0.826	0.848	.....	.....	.....	.....	0.886
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.754	0.774	0.794	0.814	.....	.....	.....	.....	0.839
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.732	0.751	0.770	0.789	.....	.....	.....	.....	0.799
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.700	0.713	0.731	0.749	.....	.....	.....	.....	0.658
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.681*	0.698	0.715	.....	.....	.....	.....	0.573
100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.575*	0.587	0.599	.....	.....	.....	.....	0.519
150	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.514*	0.523*	0.531*	.....	.....	.....	.....	0.484
200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.478*	0.483*	0.489*	.....	.....	.....	.....	
250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.454*	0.459*	0.463*					

* Probably supercooled with respect to ice.

TABLE 4d-4. V/V_0 OF PLASTICS [5]

P, kilobars	Aeroglass 4121[a]	Bakelite	α-Beetle filler[b]	Cellulose acetate	Fluorine plastic[c]	Laminac 4201[d]	Lucite	Melmac 404[e]	Melmac 1079[f]	Melmac S-6004[g]	Nylon 6-10[h]	Nylon 6-6 unoriented[i]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.960	0.979	0.979	0.964	0.967	0.967	0.968	0 980	0.980	0.980	0.967	0.971
4	0.934	0.962	0.961	0.936	0.943	0.944	0.941	0 963	0.962	0.973	0.944	0.948
6	0.914	0.957	0.957	0.914	0.924	0.926	0.920	0 948	0.947	0.962	0.924	0.930
8	0.898	0.933	0.934	0.896	0.909	0.911	0.903	0 935	0.934	0.952	0.907	0.915
10	0.884	0.922	0.922	0.881	0.896	0.899	0.889	0 929	0.929	0.943	0.893	0.903
12	0.872	0.911	0.912	0.868	0.885	0.887	0.877	0 914	0.912	0.935	0.880	0.891
14	0.861	0.901	0.902	0.856	0.876	0.877	0.866	0.904	0.903	0.927	0.868	0.881
16	0.851	0.892	0.894	0.846	0.867	0.868	0.856	0.895	0.894	0.920	0.858	0.872
18	0.842	0.883	0.886	0.836	0.858	0.859	0.847	0.887	0.886	0.914	0.848	0.863
20	0.833	0.875	0.878	0.827	0.851	0.851	0.839	0.879	0.878	0.907	0.840	0.855
22	0.825	0.867	0.871	0.819	0.845	0.843	0.831	0.872	0.871	0.902	0.832	0.847
24	0.817	0.860	0.864	0.811	0.838	0.836	0.823	0.865	0.864	0.897	0.826	0.840
26	0.810	0.853	0.858	0.804	0.832	0.830	0.817	0.858	0.858	0.892	0.819	0.834
28	0.803	0.847	0.852	0.797	0.827	0.824	0.810	0.852	0.852	0.887	0.813	0.827
30	0.797	0.841	0.847	0.792	0.822	0.817	0.804	0.847	0.847	0.883	0.807	0.822
32	0.792	0.835	0.842	0.786	0.817	0.812	0.798	0.842	0.842	0.878	0.802	0.816
34	0.787	0.830	0.837	0.780	0.813	0.807	0.793	0.837	0.837	0.875	0.798	0.811
36	0.737	0.826	0.832	0.775	0.809	0.802	0.788	0.833	0.833	0.872	0.793	0.806
38	0.728	0.821	0.828	0.771	0.806	0.797	0.784	0.828	0.828	0.868	0.789	0.802
40	0.724	0.817	0.824	0.767	0.803	0.793	0.780	0.824	0.824	0.865	0.785	0.797

[a] Clear and copolymer type, no filler.
[b] Urea-formaldehyde, α-cellulose filler.
[c] Experimental, developed during World War II.
[d] Clear cast copolymer-type resin similar to that used in laminating applications, no filler.
[e] Melamine-formaldehyde, no filler, in 1948 an experimental product.
[f] Melamine-formaldehyde, α-cellulose filler.
[g] Melamine-formaldehyde, asbestos filler.
[h] Cut from sheet about 0.25 in. thick.
[i] Provided in rod 0.5 in. in diameter (unoriented). Oriented specimen produced by upsetting cylinder originally 1 in. long by one-sided compression between platens of a hydraulic press until thickness reduced to 0.085 in.

TABLE 4d-4. V/V_0 OF PLASTICS [5] (*Continued*)

P, kilobars	Nylon 6-6 oriented[i]	Poly-styrene	Silicone 160[j]	Silicone 181[k]	Silicone 180[l]	Silicone 167[m]	Silicone 120[n]	Silicone 125[n]	Silicone 150	Silicone, glass-filled	Teflon[o]	48,000[q]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.968	0.958	0.921	0.932	0.936	0.934	0.915	0.910	0.930	0.971	0.953	0.956
4	0.946	0.931	0.892	0.900	0.910	0.905	0.883	0.880	0.900	0.951	0.925	0.928
6	0.927	0.910	0.872	0.879	0.891	0.886	0.862	0.859	0.880	0.935	0.904	0.906
											p	
8	0.911	0.894	0.857	0.862	0.875	0.872	0.847	0.842	0.863	0.925	0.865	0.888
10	0.897	0.879	0.844	0.848	0.864	0.860	0.834	0.827	0.850	0.908	0.853	0.873
12	0.885	0.866	0.834	0.836	0.853	0.851	0.822	0.815	0.838	0.897	0.842	0.860
14	0.873	0.854	0.825	0.825	0.843	0.842	0.813	0.805	0.828	0.887	0.833	0.848
16	0.863	0.843	0.816	0.815	0.835	0.835	0.804	0.796	0.819	0.878	0.825	0.838
18	0.854	0.833	0.810	0.806	0.826	0.829	0.796	0.788	0.810	0.869	0.818	0.829
20	0.844	0.824	0.803	0.798	0.820	0.823	0.789	0.781	0.803	0.811	0.811	0.820
22	0.836	0.816	0.797	0.790	0.813	0.818	0.783	0.775	0.796	0.803	0.805	0.812
24	0.828	0.807	0.792	0.783	0.807	0.814	0.777	0.769	0.790	0.796	0.799	0.805
26	0.821	0.800	0.787	0.776	0.801	0.809	0.772	0.764	0.785	0.789	0.794	0.798
28	0.814	0.794	0.782	0.770	0.796	0.805	0.767	0.760	0.780	0.782	0.789	0.791
30	0.808	0.787	0.778	0.764	0.790	0.801	0.763	0.756	0.775	0.776	0.784	0.785
32	0.802	0.782	0.774	0.758	0.786	0.798	0.758	0.751	0.770	0.770	0.780	0.780
34	0.797	0.776	0.770	0.753	0.781	0.794	0.755	0.748	0.766	0.765	0.776	0.775
36	0.792	0.772	0.766	0.749	0.777	0.791	0.751	0.744	0.763	0.760	0.772	0.770
38	0.788	0.767	0.762	0.744	0.773	0.788	0.748	0.741	0.759	0.756	0.768	0.766
40	0.784	0.763	0.759	0.740	0.765	0.780	0.745	0.737	0.756	0.752	0.765	0.762

[i] 30 % zinc oxide, 30 % titanium oxide, 40 % high-polymeric methyl silicone.
[k] 60 % silica, 40 % high-polymeric methyl silicone.
[l] 30 % titanium oxide, 30 % silica, 40 % high-polymeric methyl silicone.
[m] 60 % titanium oxide, 40 % high-polymeric methyl silicone.
[n] 50 % titanium oxide and 50 % high-polymeric methyl silicone.
[o] Polytetrafluorethylene.
[p] Transition at 6.4; volumes 0.8996 and 0.8770.
[q] Phenolic formaldehyde types.

TABLE 4d-4. V/V_0 OF PLASTICS [5] (*Continued*)

P, kilobars	41,000[q]	46,000[r]	2060-39[s]	M-1805[t]	M-2348[u]	M-1364[v]	M-2347[w]	M-2343[x]	M-2345[y]	M-2346[z]	M-2344[aa]	M-2342[bb]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.977	0.970	0.965	0.939	0.951	0.946	0.954	0.963	0.970	0.961	0.952	0.961
4	0.958	0.945	0.940	0.910	0.921	0.920	0.928	0.937	0.933	0.936	0.926	0.934
6	0.941	0.926	0.920	0.888	0.899	0.900	0.909	0.916	0.911	0.916	0.906	0.912
8	0.927	0.910	0.905	0.872	0.881	0.884	0.893	0.900	0.893	0.899	0.889	0.894
10	0.914	0.896	0.890	0.857	0.865	0.869	0.879	0.885	0.878	0.884	0.874	0.879
12	0.902	0.883	0.877	0.845	0.852	0.857	0.866	0.873	0.864	0.871	0.862	0.864
14	0.891	0.872	0.865	0.835	0.840	0.845	0.855	0.862	0.852	0.859	0.859	0.852
16	0.881	0.861	0.853	0.825	0.829	0.834	0.844	0.850	0.841	0.848	0.839	0.841
18	0.872	0.852	0.843	0.817	0.820	0.824	0.835	0.840	0.832	0.838	0.829	0.831
20	0.863	0.843	0.834	0.809	0.811	0.815	0.825	0.831	0.822	0.829	0.820	0.822
22	0.856	0.835	0.825	0.802	0.803	0.807	0.817	0.822	0.814	0.821	0.812	0.813
24	0.849	0.827	0.817	0.796	0.796	0.799	0.810	0.814	0.807	0.814	0.804	0.806
26	0.842	0.820	0.810	0.790	0.789	0.792	0.803	0.806	0.799	0.807	0.797	0.799
28	0.836	0.814	0.803	0.785	0.782	0.786	0.797	0.799	0.793	0.800	0.791	0.792
30	0.830	0.808	0.797	0.779	0.777	0.780	0.791	0.793	0.787	0.794	0.785	0.787
32	0.824	0.802	0.792	0.774	0.771	0.775	0.785	0.787	0.782	0.789	0.779	0.781
34	0.820	0.797	0.786	0.770	0.766	0.770	0.780	0.782	0.777	0.784	0.774	0.776
36	0.815	0.792	0.781	0.765	0.761	0.765	0.775	0.777	0.772	0.779	0.770	0.771
38	0.810	0.788	0.777	0.761	0.756	0.761	0.771	0.773	0.768	0.775	0.765	0.767
40	0.806	0.784	0.773	0.756	0.752	0.757	0.766	0.769	0.764	0.771	0.761	0.763

[r] Glyptal, made by reaction of a dibasic acid, such as phthalic, with glycerin or a like compound.
[s] Polyester resin, made by reaction of a dibasic acid containing maleic acid with a glycol, hardened with a vinyl material such as styrene.
[t] Polyethylene, experimental low-molecular-weight, 100 % base resin.
[u] Polyethylene, standard DYNH 100 % base resin.
[v] Polyethylene, experimental high-molecular-weight, 100 % base resin.
[w] Vinylite VYNW-5 resin, 98 % base resin, 2 % organotin heat stabilizer by weight.
[x] Vinylite VYNW-5 resin, 73.6 % base resin, 1.7 % organotin heat stabilizer, 24.7 % tricresyl phosphate by weight.
[y] Vinylite VYNS resin, 98 % base resin, 2 % organotin heat stabilizer by weight.
[z] Vinylite VYNW-5 resin, 76.0 % base resin, 1.7 % organotin heat stabilizer, 22.3 % resinous products G-25 (resinous-type plasticizer reported to be a condensation product of sebacic acid, glycerol, and rincinoleic acid).
[aa] Vinylite VYHH resin, 98 % base resin, 2 % organotin heat stabilizer by weight.
[bb] Vinylite VYNW-5 resin, 76.6 % base resin, 1.7 % organotin heat stabilizer, 21.7 % dioctyl phthalate by weight.

TABLE 4d-5. V/V_0 OF RUBBERS [6]

P, kilobars	Ameripol 0-7700	Buna S 8774	Butyl gum	Butyl tread	Duprene	Goodrich D-402	Goodrich D-420	Goodrich D-453	Goodrich D-453	Hard rubber (new, 2-3 yrs)	Hard rubber (old, 25 yrs)	Hevea gum	Hevea tread	Hood 844 A	Koroseal 89023	Neoprene 832	Rubber *A*	Rubber *B*	Rubber *C* [30]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.965	0.952	0.937	0.956	0.973	0.956	0.956	0.872	0.857	0.968	0.966	0.945	0.945	0.953	0.948	0.950	0.983	0.977	0.974
4	0.941	0.925	0.912	0.929	0.952	0.930	0.932	0.950	0.931	0.944	0.943	0.914	0.921	0.929	0.913	0.923	0.955	0.941	0.937
6	0.922	0.906	0.895	0.910	0.936	0.911	0.914	0.933	0.910	0.925	0.924	0.892	0.903	0.910	0.891	0.903	0.931	0.918	0.910
8	0.908	0.890	0.880	0.895	0.922	0.894	0.899	0.918	0.893	0.909	0.907	0.873	0.888	0.894	0.873	0.886	0.912	0.900	0.892
10	0.894	0.876	0.868	0.882	0.910	0.885	0.887	0.906	0.879	0.895	0.893	0.857	0.875	0.881	0.859	0.872	0.898	0.887	0.877
12	0.884	0.865	0.857	0.872	0.899	0.868	0.875	0.895	0.867	0.883	0.880	0.845	0.863	0.870	0.847	0.859	0.874	0.874	0.855
14	0.873	0.854	0.847	0.863	0.890	0.857	0.865	0.885	0.855	0.871	0.868	0.833	0.853	0.860	0.936	0.848			
16	0.864	0.844	0.838	0.856	0.882	0.848	0.856	0.877	0.846	0.860	0.858	0.822	0.843	0.850	0.826	0.837			
18	0.855	0.840	0.830	0.849	0.874	0.839	0.847	0.869	0.837	0.851	0.849	0.813	0.835	0.841	0.817	0.827			
20	0.847	0.827	0.822	0.843	0.867	0.831	0.840	0.862	0.829	0.842	0.840	0.805	0.826	0.833	0.810	0.818			
22	0.840	0.818	0.815	0.839	0.861	0.924	0.932	0.856	0.822	0.834	0.832	0.797	0.819	0.825	0.803	0.810			
24	0.833	0.811	0.809	0.934	0.855	0.817	0.825	0.850	0.815	0.826	0.824	0.790	0.812	0.818	0.796	0.802			
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.819	0.816								
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.812	0.810								
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.806	0.803								
32	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.800	0.797								
34	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.795	0.792								
36	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.790	0.787								
38	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.886	0.782								
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.882	0.778								

Notes:

A. Hard rubber from panel made by the Goodrich Company. It is a rubber-sulfur compound containing no inorganic fillers. The total sulfur amounts to 27.4 %, of which 0.21 % is free sulfur. Density equals 1.149 at 27°C.

B. A rubber-sulfur compound containing 90 % smoked rubber and 10 % sulfur, and vulcanized 105 min at 300°F. Density = 0.990 at 25°C.

C. 90.75 % pale crepe rubber, 5 % zinc oxide, 4 % sulfur, 0.25 % tetramethylthiuram disulfide. It was vulcanized 30 min at 260°F. Density = 0.990 at 27°C.

TABLE 4d-6. V/V_0 OF GLASSES [2]

P, kilobars	Basalt glass [31]	Borax glass	Quartz glass	Pyrex glass	Glass *A*	Glass *C*	Glass *D*
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	0.988	0.965	0.982	0.981	0.984	0.988	0.983
10	0.978	0.936	0.963	0.963	0.969	0.975	0.967
15	0.968	0.913	0.946	0.947	0.956	0.964	0.953
20	0.959	0.894	0.932	0.931	0.944	0.954	0.940
25	0.951	0.877	0.918	0.917	0.933	0.945	0.930
30	0.942	0.864	0.905	0.905	0.923	0.935	0.921
35	0.934	0.851	0.893	0.894	0.913	0.927	0.912
40	0.927	0.840	0.882	0.883	0.903	0.918	0.904
45	0.921	0.830	0.872	0.874	0.895	0.910	0.897
50	0.915	0.821	0.862	0.865	0.887	0.902	0.890
55	.....	0.812	0.853	0.857	0.879	0.894	0.883
60	.....	0.803	0.844	0.849	0.872	0.887	0.876
65	.....	0.791	0.836	0.842	0.865	0.880	0.870
70	.....	0.788	0.829	0.835	0.859	0.873	0.865
75	.....	0.781	0.822	0.829	0.853	0.867	0.859
80	.....	0.775	0.816	0.824	0.847	0.862	0.853
85	.....	0.769	0.810	0.819	0.841	0.856	0.847
90	.....	0.863	0.805	0.815	0.836	0.861	0.842
95	.....	0.757	0.800	0.811	0.830	0.846	0.837
100	.....	0.752	0.797	0.807	0.825	0.841	0.833

Notes:
A. A potash-lead silicate of very high lead content.
C. A soda-potash-lime silicate.
D. A soda-zinc borosilicate.

TABLE 4d-7. V/V_0 OF DIMETHYLSILOXANE POLYMERS [24]

P, kilobars	Dimer	Trimer	Tetra-mer	Penta-mer	Hexa-mer	Hepta-mer	Octa-mer
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.857	0.863	0.869	0.871	0.877	0.876	0.880
	[a]						
4	0.760	0.809	0.816	0.818	0.824	0.823	0.828
6	0.738	0.780	0.797	0.800	0.806	0.805	0.810
8	0.720	0.740	0.758	0.763	0.765	0.762	0.764
10	0.707	0.722	0.740	0.745	0.748	0.747	0.750
12	0.695	0.708	0.725	0.730	0.734	0.734	0.736
14	0.685	0.695	0.712	0.717	0.722	0.723	0.725
16	0.676	0.685	0.701	0.706	0.712	0.712	0.715
18	0.668	0.675	0.692	0.697	0.702	0.704	0.706
20	0.660	0.666	0.683	0.688	0.693	0.695	0.698
22	0.653	0.658	0.676	0.680	0.686	0.689	0.691
24	0.647	0.651	0.669	0.673	0.679	0.682	0.685
26	0.641	0.644	0.663	0.667	0.673	0.675	0.678
28	0.635	0.638	0.657	0.661	0.667	0.670	0.673
30	0.630	0.633	0.652	0.656	0.662	0.664	0.668
32	0.625	0.628	0.647	0.651	0.657	0.660	0.663
34	0.620	0.623	0.643	0.647	0.652	0.655	0.659
36	0.616	0.618	0.639	0.642	0.648	0.651	0.655
38	0.612	0.614	0.635	0.638	0.645	0.647	0.652
40	0.607	0.610	0.632	0.635	0.641	0.643	0.648

[a] Freezes at 3.7; volumes 0.805 and 0.708.

TABLE 4d-8. V/V_0 OF "DOW-CORNING FLUIDS"* [24]

P, kilobars	500-0.65	500-1.00	500-2.00	500-12.8	200-100	200-350	200-1,000	200 12,500	550-112
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.854	0.866	0.873	0.887	0.880	0.880	0.888	0.885	0.918
4	[a] 0.756	0.811	0.813	0.831	0.833	0.837	0.836	0.834	0.875
6	0.734	0.777	0.780	0.800	0.803	0.809	0.806	0.807	0.852
8	0.717	0.754	0.757	0.780	0.781	0.787	0.785	0.786	0.835
10	0.703	0.736	0.739	0.764	0.764	0.769	0.768	0.771	0.820
12	0.691	0.722	0.725	0.750	0.750	0.754	0.754	0.757	0.807
14	0.681	0.710	0.712	0.738	0.738	0.740	0.743	0.745	0.795
16	0.671	0.699	0.701	0.727	0.728	0.728	0.733	0.740	0.785
18	0.663	0.690	0.691	0.717	0.719	0.717	0.724	0.726	0.776
20	0.655	0.682	0.682	0.709	0.712	0.709	0.716	0.717	0.767
22	0.649	0.675	0.675	0.701	0.705	0.698	0.709	0.710	0.759
24	0.643	0.668	0.668	0.694	0.698	0.690	0.702	0.703	0.752
26	0.637	0.663	0.663	0.687	0.692	0.682	0.696	0.697	0.745
28	0.632	0.657	0.657	0.682	0.686	0.676	0.690	0.690	0.739
30	0.628	0.652	0.652	0.676	0.681	0.669	0.685	0.685	0.733
32	0.624	0.647	0.646	0.672	0.676	0.664	0.680	0.680	0.727
34	0.619	0.643	0.642	0.667	0.671	0.658	0.675	0.676	0.722
36	0.615	0.639	0.637	0.663	0.667	0.654	0.671	0.671	0.718
38	0.611	0.636	0.633	0.659	0.663	0.650	0.667	0.667	0.714
40	0.607	0.632	0.629	0.656	0.659	0.646	0.664	0.663	0.710

* 500 and 200 series are primarily dimethylsiloxane polymers of varying viscosities. 550 series has a portion of the methyl groups replaced by phenyl groups.

[a] Freezes at 3.9; volumes 0.796 and 0.760.

TABLE 4d-9. V/V_0 OF OIL AND KEROSENE

P, kilobars	Fluorocarbons [24]		P, kilobars	Kerosene [32]
	Light	Oil		
0	1.000	1.000	0	1.000
2	0.848	0.918	5	0.898
4	0.792	0.879	10	0.856
6	[a] 0.743		15	0.825
8	0.725		20	0.800
10	0.711		25	0.776
12	0.700		30	0.763
14	0.690		35	
16	0.682		40	
18	0.675		45	
20	0.669		50	
22	0.664		55	
24	0.658		60	
26	0.655		65	
28	0.650		70	
30	0.647		75	
32	0.643		80	
34	0.641		85	
36	0.638		90	
38	0.636		95	
40	0.634		100	

[a] Freezes at 4.3; volumes 0.786 and 0.761.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS*

Pressure, kilobars	Ag_2Al [13]	Ag-Au alloys† [14]			Ag 98.70 Cd 1.30 [13]	Ag 91.40 In 8.60 [37]	Ag 96.92 Mg 3.08 [37]	Ag-Mn system [37]		
		75 Ag 25 Au	50 Ag 50 Au	25 Ag 75 Au				100 Ag	96.15 Ag 3.85 Mn	85.41 Ag 14.59 Mn
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.997	0.998	0.998	0.998	0.997	0.997	0.998	0.998	0.998	0.998
4	0.995	0.997	0.997	0.997	0.995	0.995	0.996	0.996	0.996	0.996
6	0.993	0.995	0.996	0.995	0.993	0.993	0.994	0.994	0.994	0.993
8	0.991	0.994	0.995	0.994	0.992	0.991	0.992	0.992	0.992	0.991
10	0.989	0.993	0.994	0.993	0.990	0.990	0.990	0.990	0.990	0.989
12	0.987	0.992	0.993	0.992	0.988	0.988	0.988	0.988	0.988	0.987
14	0.986	.....	.....	.....	0.987	0.986	0.987	0.987	0.986	0.985
16	0.984	.....	.....	.....	0.985	0.985	0.985	0.985	0.984	0.983
18	0.982	.....	.....	.....	0.983	0.983	0.983	0.983	0.982	0.981
20	0.980	.....	.....	.....	0.981	0.981	0.982	0.982	0.980	0.979
22	0.979	.....	.....	.....	0.980	0.980	0.980	0.980	0.978	0.977
24	0.977	.....	.....	.....	0.978	0.978	0.978	0.978	0.977	0.975
26	0.976	.....	.....	.....	0.977	0.976	0.977	0.976	0.975	0.973
28	0.974	.....	.....	.....	0.975	0.975	0.975	0.975	0.973	0.972
30	0.972	.....	.....	.....	0.974	0.973	0.973	0.973	0.971	0.970

* For references see p. 4-96.
† At 30°.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Ag-Pd system [33]					Ag-Pt system [37]		AgZn [13]	Ag_5Zn_8 [13]	Ag 96.44 Zn 3.56 [13]	Al-Mg system [33]	
	100 Ag	79.0 Ag 21.0 Pd	48.9 Ag 51.1 Pd	29.5 Ag 70.5 Pd	100 Pd	100 Ag	92.75 Ag 7.25 Pt				100 Al	85.7 Al 14.3 Mg
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.998	0.999	0.999	0.998	0.998	0.998	0.998	0.998	0.998	0.997	0.997
4	0.996	0.996	0.997	0.997	0.997	0.996	0.996	0.996	0.996	0.996	0.994	0.993
6	0.994	0.995	0.996	0.996	0.996	0.994	0.994	0.993	0.993	0.994	0.991	0.990
8	0.992	0.993	0.994	0.994	0.995	0.992	0.992	0.991	0.992	0.992	0.989	0.987
10	0.990	0.991	0.993	0.993	0.994	0.990	0.990	0.989	0.989	0.991	0.986	0.984
12	0.988	0.989	0.991	0.992	0.993	0.988	0.988	0.987	0.987	0.989	0.984	0.981
14	0.987	0.988	0.990	0.991	0.992 [a]	0.987	0.987	0.985	0.985	0.987	0.982	0.978
16	0.985	9.986	0.988	0.990	0.991	0.985	0.985	0.983	0.983	0.985	0.979	0.975
18	0.933	0.985	0.987	0.988	0.990	0.983	0.983	0.981	0.981	0.983	0.977	0.973
20	0.982	0.983	0.986	0.987	0.989	0.982	0.982	0.980	0.979	0.982	0.974	0.970
22	0.980	0.982	0.984	0.986	0.988	0.980	0.980	0.978	0.977	0.980	0.972	0.967
24	0.978	0.981	0.983	0.985	0.987	0.978	0.978	0.976	0.975	0.979 [b]	0.970	0.965
26	0.976	0.979	0.982	0.984	0.986	0.976	0.977	0.975	0.973	0.976	0.967	0.963
28	0.975	0.978	0.981	0.983	0.985	0.975	0.975	0.973	0.972	0.975	0.965	0.961
30	0.973	0.977	0.980	0.982	0.985	0.973	0.974	0.972	0.970	0.973	0.963	0.958

* For references see p. 4-96.
[a] Cusp at 14.7.
[b] Slight discontinuity here.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Al-Zn system [33]		Au-Ag system [37]		Au-Mn system [37]			Au-Pd system [37]		Au-Pt system [37]		AuZn [13]
	100 Al	90 Al 10 Zn	100 Au	94.65 Au 5.35 Ag	100 Au	93.17 Au 6.83 Mn	81.36 Au 18.64 Mn	100 Au	96.01 Au 3.99 Pd	100 Au	95.96 Au 4.04 Pt	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.998	0.999	0.999	0.999	0.998	0.998	0.999	0.999	0.999	0.998	0.997
4	0.995	0.995	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.996
6	0.992	0.992	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.994
8	0.989	0.989	0.995	0.995	0.995	0.995	0.994	0.995	0.995	0.995	0.994	0.993
10	0.987	0.987	0.994	0.993	0.994	0.994	0.993	0.994	0.994	0.994	0.993	0.992
12	0.984	0.984	0.993	0.992	0.993	0.993	0.992	0.993	0.993	0.993	0.992	0.990
14	0.982	0.982	0.992	0.991	0.992	0.992	0.991	0.992	0.992	0.992	0.991	0.988
16	0.979	0.979	0.991	0.990	0.991	0.990	0.989	0.991	0.991	0.991	0.990	0.987
18	0.977	0.977	0.990	0.989	0.990	0.989	0.988	0.990	0.990	0.990	0.989	0.996
							[b]					
20	0.975	0.974	0.988	0.987	0.988	0.988	0.986	0.988	0.989	0.988	0.988	0.984
22	0.972	0.971	0.987	0.986	0.987	0.987	0.985	0.987	0.988	0.987	0.987	0.983
24	0.970	0.969	0.996	0.985	0.986	0.986	0.984	0.986	0.987	0.986	0.986	0.982
									[b]			
26	0.968	0.967	0.985	0.984	0.985	0.985	0.983	0.985	0.985	0.985	0.985	0.980
28	0.966	0.965	0.984	0.983	0.984	0.984	0.982	0.984	0.984	0.984	0.984	0.799
30	0.964	0.963	0.983	0.982	0.983	0.983	0.981	0.983	0.983	0.983	0.983	0.798

* For references see p. 4-96.
[b] Slight discontinuity here.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Bi-Ag system [34]			Bi-In system [34]					Bi-Pb system [34]			
	100 Bi	50 Bi 50 Ag	100 Ag	100 Bi	80 B 20 In	50 Bi 50 In	25 Bi 75 In	100 In	100 Bi	75 Bi 25 Pb Inc.	75 Bi 25 Pb Dec.	50 Bi 50 Pb
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.993	0.995	0.997	0.993	0.995	0.994	0.995	0.995	0.993	0.994	0.993	0.994
4	0.987	0.990	0.995	0.987	0.989	0.988	0.990	0.990	0.987	0.989	0.987 *i*	0.990
6	0.981	0.985	0.993	0.981	0.983	0.983	0.985	0.985	0.981	0.984	0.975	0.985
8	0.976	0.980	0.991	0.976	0.977	0.977	0.980	0.981	0.976	0.979	0.968	0.980
10	0.970	0.976	0.990	0.970	0.972	0.972	0.976	0.976	0.970	0.974	0.961	0.975
12	0.965	0.971	0.988	0.965	0.967	0.967	0.971	0.972	0.965	0.969	0.955	0.971
14	0.961	0.967	0.986	0.961	0.962	0.963	0.967	0.968	0.961	0.964	0.950	0.966
16	0.956	0.963	0.984	0.956	0.957	0.958	0.962	0.963	0.956	0.959	0.945	0.962
18	0.952	0.959	0.982	0.952	0.952 *e*	0.954	0.958	0.959	0.952	0.955	0.940	0.957
20	0.948	0.955	0.981	0.948	0.948	0.949	0.953	0.955	0.948	0.950	0.935	0.953, 0.938
22	0.944	0.951	0.979	0.944	0.944	0.945	0.950	0.951	0.944	0.945	0.931	0.948, 0.935
24	0.940 *c*	0.948 *d*	0.978	0.940 *c*	0.940 *f*	0.941	0.945	0.948	0.940 *c*	0.941 *h*	0.928 *j*	0.944, 0.931
26	0.902	0.880	0.976	0.902	0.883	0.937	0.941	0.944	0.902	0.885	0.887	0.928
28	0.899	0.876	0.974	0.899	0.880 *g*	0.933	0.937	0.941	0.899	0.882	0.884	0.924
30	0.896	0.874	0.973	0.896	0.876	0.929	0.933	0.937	0.896	0.878	0.880	0.921
32	0.893	0.871	0.971	0.893	0.873	0.925	0.930	0.933	0.893	0.875	0.877	0.918
34	0.890	0.868	0.970	0.890	0.870	0.921	0.926	0.930	0.890	0.872	0.873	0.915
36	0.887	0.866	0.968	0.887	0.867	0.918	0.922	0.927	0.887	0.869	0.870	0.912
38	0.885	0.863	0.967	0.885	0.865	0.914	0.918	0.924	0.885	0.866	0.867	0.909
40	0.882	0.861	0.966	0.882	0.862	0.911	0.915	0.920	0.882	0.863	0.864	0.906

* For references see p. 4-96.

c Transition in this region. *d* Transition; volumes at 24.5 = 0.948 and 0.833. *e* Volumes at 19.6 = 0.950 and 0.938. *f* Volumes at 24.5 = 0.939 and 0.887.

g Volumes at 29.4 = 0.895 and 0.878. *h* Volumes at 24.5 = 0.940, 0.905, 0.888. *i* Volumes at 4.9 = 0.985, 0.978. *j* Volumes at 24.5 = 0.926, 0.904, 0.890.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Bi-Pb system [34]		Bi-Sb system [34]					Bi-Te system [34]		Ca-Cd system [36]		
	25 Bi 75 Pb	100 Pb	100 Bi	80 Bi 20 Sb	50 Bi 50 Sb	20 Bi 80 Sb	100 Sb	100 Bi	99.00 Bi 1.00 Te	100 Ca	95 Ca 5 Cd	100 Cd
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.995	0.995	0.993	0.995	0.995	0.995	0.995	0.993	0.994	0.987	0.987	0.994
4	0.990	0.990	0.987	0.990	0.991	0.990	0.989	0.987	0.988	0.974	0.977	0.990
6	0.985	0.985	0.981	0.985	0.987	0.985	0.984	0.981	0.983	0.962	0.967	0.986
8	0.980	0.981	0.976	0.980	0.983	0.981	0.980	0.976	0.978	0.952	0.958	0.982
10	0.976	0.977	0.970	0.976	0.979	0.976	0.975	0.970	0.973	0.941	0.949	0.977
12	0.971	0.972	0.965	0.971	0.975	0.972	0.971	0.965	0.968	0.931	0.941	0.973
14	0.967	0.968	0.961	0.967	0.956	0.968	0.966	0.961	0.963	0.922	0.932	0.969
16	0.963	0.965	0.956	0.962	0.967	0.964	0.962	0.956	0.958	0.913	0.924	0.966
18	0.959	0.961	0.952	0.958	0.964	0.960	0.958	0.952	0.953	0.904	0.916	0.962
20	0.955	0.957	0.948	0.954	0.960	0.957	0.954	0.948	0.949	0.896	0.909	0.958
22	0.951	0.954	0.944	0.949	0.956	0.953	0.951	0.944	0.947	0.888	0.902	0.955
24	0.947	0.951	0.940 [c]	0.945	0.953	0.949	0.947	0.940 [c]	0.942 [l]	0.881	0.895	0.951
26	0.944	0.948	0.902	0.941	0.949	0.945	0.943	0.902	.....	0.873	0.889	0.948
28	0.940	0.945	0.899	0.937	0.946	0.942	0.940	0.899	0.849	0.867	0.882	0.944
30	0.937	0.942	0.896	..... [c]	0.942	0.939	0.937	0.896	0.846	0.860	0.876	0.941
32	0.934	0.939	0.893		0.938	0.935	.....	0.893	0.843	0.853	0.870	0.938
34	0.931	0.936	0.890	.....	0.935	0.932	.....	0.890	0.840	0.848	0.864	0.935
36	0.928	0.933	0.887	0.887	..... [c, k]	0.929	.....	0.887	0.838	0.842	0.859	0.932
38	0.925	0.930	0.885	0.877	.....	0.926	.....	0.885	0.835	0.836	0.853	0.929
40	0.922	0.928	0.882	0.867	.....	0.923	.....	0.882	0.833	0.830	0.848	0.926

* For references see p. 4-96.
[c] Transition in this region.
[k] Volume at 39.2 = 0.913.
[l] At 26.0 $V_{I-II} = 0.048$, and $V_{II-III} = 0.034$.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Ca-Mg system [36]				Carboloy 999† [13]	0.05 C 0.09 Mn 0.01 Si 36.0 Ni 63.88 Fe [37]	Carbon steel [37]		Cd-Bi system [35]				
	100 Ca	61.9 Ca 38.1 Mg	28.6 Ca 71.4 Mg	100 Mg			100 Fe	95.69 Fe 4.31 C	100.00 Cd	75.10 Cd 24.90 Bi	50.05 Cd 49.95 Bi	24.40 Cd 75.58 Bi	100.00 Bi
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.987	0.989	0.990	0.994	0.999	0.997	0.998	0.998	0.995	0.994	0.994	0.994	0.993
4	0.974	0.980	0.982	0.988	0.998	0.995	0.997	0.997	0.991	0.990	0.989	0.988	0.987
6	0.962	0.971	0.974	0.983	0.998	0.993	0.996	0.996	0.987	0.985	0.983	0.983	0.981
8	0.952	0.963	0.968	0.977	0.997	0.992	0.995	0.995	0.983	0.980	0.978	0.978	0.976
10	0.941	0.955	0.961	0.972	0.997	0.990	0.993	0.993	0.979	0.976	0.974	0.973	0.970
12	0.931	0.947	0.955	0.968	0.996	0.988	0.992	0.992	0.975	0.972	0.970	0.968	0.965
14	0.922	0.940	0.948	0.963	0.996	0.986	0.991	0.991	0.972	0.968	0.965	0.964	0.961
16	0.913	0.933	0.942	0.958	0.995	0.984	0.990	0.990	0.968	0.964	0.961	0.959	0.956
18	0.904	0.926	0.937	0.953	0.995	0.983	0.989	0.989	0.965	0.960	0.957	0.955	0.952
20	0.896	0.920	0.932	0.949	0.995	0.981	0.988	0.988	0.962	0.956	0.953	0.950	0.948
22	0.888	0.914	0.926	0.945	0.994	0.980	0.987	0.987	0.959	0.952	0.949	0.946	0.944
24	0.881	0.908	0.921	0.941	0.994	0.978	0.986	0.986	0.956	0.949	0.945	0.942	0.940
										m	*o*	*q*	*c*
26	0.873	0.902	0.917	0.936	0.993	0.976	0.985	0.985	.....	0.928	0.919	0.899	0.902
28	0.867	0.897	0.912	0.932	0.993	0.975	0.984	0.984	.....	0.925	0.902	0.897	0.899
										n	*p*	*r*	
30	0.860	0.892	0.907	0.928	0.992	0.974	0.983	0.983	.....	0.905	0.884	0.863	0.896
32	0.853	0.887	0.903	.....	.....	.....	.....	.....	.....	0.902	0.880	0.860	0.893
34	0.848	0.882	0.899	.....	.....	.....	.....	.....	.....	0.899	0.877	0.857	0.890
36	0.842	0.877	0.895	.....	.....	.....	.....	.....	.....	0.897	0.874	0.854	0.887
38	0.836	0.873	0.891	.....	.....	.....	.....	.....	.....	0.895	0.872	0.852	0.885
40	0.830	0.869	0.888	.....	.....	.....	.....	.....	.....	0.892	0.870	0.850	0.882

* For references see p. 4-96.
† WC with 3 % Co binder.
[c] Transition in this region. [m] Volumes at 24.5 = 0.948 and 0.931. [n] Volumes at 28.4 = 0.925 and 0.910. [o] Volumes at 24.5 = 0.945 and 0.915.
[p] Volumes at 28.4 = 0.901 and 0.888. [q] Volumes at 24.5 = 0.941 and 0.901. [r] Volumes at 28.4 = 0.897 and 0.868.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Cd-Pb system [36]			Cd-Sn system [36]					Cd-Zn system [36]		
	100 Cd	50 Cd 50 Pd	100 Pd	100 Cd	75 Cd 25 Sn	50 Cd 50 Sn	25 Cd 75 Sn	100 Sn	100 Cd	50 Cd 50 Zn	100 Zn
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.995	0.994	0.994	0.995	0.995	0.996	0.996	0.996	0.995	0.995	0.996
4	0.990	0.991	0.990	0.990	0.991	0.992	0.992	0.922	0.990	0.992	0.993
6	0.987	0.987	0.986	0.987	0.987	0.988	0.988	0.988	0.987	0.988	0.990
8	0.983	0.983	0.982	0.983	0.983	0.984	0.984	0.984	0.983	0.985	0.987
10	0.979	0.979	0.977	0.979	0.979	0.980	0.981	0.981	0.979	0.981	0.984
12	0.976	0.975	0.973	0.976	0.976	0.977	0.977	0.977	0.976	0.978	0.981
14	0.973	0.971	0.969	0.973	0.972	0.973	0.974	0.974	0.973	0.974	0.977
16	0.969	0.967	0.966	0.969	0.969	0.970	0.971	0.971	0.969	0.971	0.975
18	0.965	0.963	0.962	0.965	0.965	0.966	0.968	0.967	0.965	0.968	0.972
20	0.962	0.960	0.958	0.962	0.962	0.963	0.965	0.964	0.962	0.965	0.969
22	0.959	0.957	0.955	0.959	0.958	0.960	0.961	0.961	0.959	0.962	0.966
24	0.956	0.953	0.951	0.956	0.955	0.957	0.958	0.958	0.956	0.959	0.964
26	0.952	0.949	0.948	0.952	0.952	0.953	0.956	0.956	0.952	0.956	0.961
28	0.950	0.946	0.944	0.950	0.949	0.951	0.953	0.953	0.950	0.953	0.958
30	0.947	0.943	0.941	0.947	0.946	0.948	0.950	0.950	0.947	0.950	0.956
32	0.944	0.940	0.938	0.944	0.943	0.945	0.948	0.948	0.944	0.947	0.954
34	0.942	0.937	0.935	0.942	0.941	0.942	0.945	0.945	0.942	0.945	0.951
36	0.939	0.934	0.932	0.939	0.939	0.940	0.942	0.943	0.939	0.942	0.949
38	0.937	0.931	0.929	0.937	0.937	0.937	0.940	0.940	0.937	0.940	0.947
40	0.935	0.929	0.926	0.935	0.934	0.934	0.938	0.938	0.935	0.938	0.945

* For references see p. 4-96.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Co-Fe system [33]			Cu-Ag system [33]		Cu-Al system [33]		Cu-Au system [33]			
	100 Co	59.06 Co 40.94 Fe	100 Fe	100 Cu	96.0 Cu 4.0 Ag	100 Cu	90.02 Cu 9.90 Al	100 Cu	93 Cu 7 Au	85 Cu 15 Au	75 Cu 25 Au
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
4	0.997	0.997	0.997	0.997	0.996	0.997	0.997	0.997	0.996	0.997	0.997
6	0.996	0.996	0.996	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
8	0.995	0.995	0.995	0.994	0.993	0.994	0.994	0.994	0.993	0.994 [b]	0.994
10	0.994	0.994	0.993	0.992	0.992	0.992	0.993	0.992	0.992	0.993	0.993
12	0.993	0.993	0.992	0.990	0.990	0.990	0.991	0.990	0.991	0.992	0.991
14	0.992	0.992	0.991	0.989	0.988	0.989	0.990	0.989	0.990	0.990	0.990
16	0.991	0.991	0.990	0.987	0.987	0.987	0.988	0.987	0.988	0.989	0.989
18	0.990	0.990	0.989	0.986	0.986	0.986	0.987	0.986	0.987 [b]	0.988	0.987
20	0.989	0.989	0.988	0.984	0.984	0.984	0.985	0.984	0.985	0.987	0.986
22	0.988	0.987	0.987	0.983	0.983	0.983	0.984	0.983	0.984	0.985	0.985
24	0.987	0.986	0.986	0.982	0.982	0.982	0.983 [c]	0.982	0.982	0.984	0.984
26	0.986	0.985	0.985	0.980	0.980	0.980	0.980	0.980	0.981	0.983	0.983
28	0.985	0.984	0.984	0.979	0.979	0.979	0.979	0.979	0.980	0.982	0.981
30	0.984	0.983	0.983	0.978	0.978	0.978	0.978	0.978	0.979	0.980	0.980

* For references see p. 4-96.
[b] Slight discontinuity here.
[c] Transition in this region.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Cu_3Au [13]	Cu_5Cd_8 R.T. [13]	Cu-Cr system [37]		Cu-Ga system [33]		Cu-Ge system [33]		Cu-Mn system [37]		
			100 Cu	99.818 Cu 0.182 Cr	100 Cu	95.85 Cu 4.15 Ga	100 Cu	98.29 Cu 1.71 Ge	100 Cu	95.40 Cu 4.60 Mn	90.86 Cu 9.14 Mn
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.999	0.997	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
4	0.997	0.995	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.996
6	0.996	0.992	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
8	0.995	0.990	0.994	0.994	0.994	0.994	0.994	0.993	0.994	0.994	0.993
10	0.993	0.988	0.992	0.992	0.992	0.992	0.992	0.992	0.992	0.992	0.992
12	0.992	0.985	0.990	0.990	0.990	0.991	0.990	0.990	0.990	0.991	0.990
14	0.990	0.983	0.989	0.989	0.989	0.989	0.989	0.989	0.989	0.989	0.989
16	0.989	0.981	0.987	0.987	0.987	0.988	0.987	0.988	0.987	0.988	0.987
18	0.988	0.978	0.986	0.986	0.986	0.987	0.986	0.986	0.986	0.987	0.986
20	0.986	0.975	0.984	0.984	0.984	0.985	0.984	0.985	0.984	0.985	0.984
22	0.985	0.973	0.983	0.983	0.983	0.984	0.983	0.984	0.983	0.984	0.983
24	0.984	0.971	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.981
26	0.983	0.969	0.980	0.980	0.980	0.981	0.980	0.981	0.980	0.981	0.980
28	0.982	0.966	0.979	0.979	0.979	0.980	0.979	0.980	0.979	0.980	0.978
30	0.980	0.964	0.978	0.978	0.978	0.978	0.978	0.979	0.978	0.978	0.977

* For references see p. 4-96.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Cu-Ni system [33]					Cu-Pd system [37]		Cu-Pt system [37]		Cu-Si system [33]		$Cu_{31}Sn_8$ [13]
	100 Cu	60 Cu 40 Ni	50 Cu 50 Ni	40 Cu 60 Ni	100 Ni	100 Cu	95.91 Cu 4.09 Pd	100 Cu	98.662 Cu 1.338 Pt	100 Cu	89.86 Cu 10.14 Si	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.998	0.998	0.999	0.999	0.998	0.998	0.998	0.998	0.998	0.998	0.998
4	0.997	0.996	0.997	0.998	0.998	0.997	0.996	0.997	0.996	0.997	0.996	0.996
6	0.995	0.995	0.996	0.996	0.997	0.995	0.995	0.995	0.995	0.995	0.995	0.994
8	0.994	0.993	0.995	0.995	0.996	0.994	0.994	0.994	0.993	0.994	0.994	0.992
10	0.992	0.992	0.993	0.994	0.995 [s]	0.992	0.993	0.992	0.992	0.992	0.992	0.991
12	0.990	0.991	0.992	0.993	0.993	0.990	0.991	0.990	0.991	0.990	0.991	0.989
14	0.989	0.989	0.991	0.991	0.992	0.989	0.990	0.989	0.990	0.989	0.990	0.987
16	0.987	0.988	0.990	0.990	0.991	0.987	0.988	0.987	0.989	0.987	0.988	0.985
18	0.986	0.987	0.988	0.989	0.990	0.986	0.987	0.986	0.987	0.986	0.987	0.984
20	0.984	0.986	0.987	0.988	0.988	0.984	0.986	0.984	0.986	0.984	0.986	0.983
22	0.983	0.985	0.986	0.987	0.987	0.983	0.984	0.983	0.985	0.983	0.985	0.981
24	0.982	0.984	0.985	0.986	0.986	0.982	0.983	0.982	0.984 [b]	0.982	0.983	0.980
26	0.980	0.983	0.984	0.985	0.985	0.980	0.982	0.980	0.982	0.980	0.982	0.978
28	0.979	0.982	0.982	0.983	0.985	0.979	0.980	0.979	0.981	0.979	0.981	0.976
30	0.978	0.981	0.981	0.982	0.984	0.978	0.979	0.978	0.980	0.978	0.980	0.974

* For references see p. 4-96.
[b] Slight discontinuity here.
[s] Cusp at 10.1.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Cu-Zn system [33]				CuZn [13]	Cu_5Zn_8 [13]	Fe-Ni alloys [37]			Fe-Si system [33]	
	100 Cu	90 Cu 10 Zn	80 Cu 20 Zn	52.7 Cu 47.3 Zn			85.58 Fe 14.42 Ni	76.16 Fe 23.84 Ni	63.0 Fe 37.0 Ni	100 Fe	94.25 Fe 5.75 Si
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.998	0.998	0.997	0.998	0.998	0.998	0.999	0.998	0.998	0.999
4	0.997	0.996	0.996	0.995	0.996	0.996	0.997	0.997	0.996	0.997	0.997
6	0.995	0.995	0.994	0.993	0.994	0.994	0.996	0.996	0.994	0.996	0.996
							[t]				
8	0.994	0.993	0.992	0.992	0.992	0.991	0.994	0.994	0.993	0.995	0.995
10	0.992	0.992	0.991	0.990	0.990	0.990	0.993	0.993	0.991	0.994	0.994
									[u]		
12	0.990	0.990	0.989	0.988	0.989	0.988	0.992	0.992	0.990	0.993	0.993
14	0.989	0.989	0.988	0.986	0.987	0.986	0.990	0.991	0.988	0.992	0.992
16	0.987	0.988	0.986	0.985	0.985	0.984	0.989	0.990	0.986	0.990	0.991
18	0.986	0.986	0.985	0.983	0.984	0.982	0.988	0.988	0.985	0.989	0.900
20	0.984	0.985	0.983	0.982	0.982	0.980	0.987	0.987	0.983	0.988	0.989
22	0.983	0.983	0.982	0.980	0.981	0.978	0.986	0.986	0.982	0.987	0.988
24	0.982	0.982	0.980	0.978	0.979	0.976	0.985	0.985	0.980	0.986	0.987
26	0.980	0.981	0.979	0.977	0.977	0.975	0.984	0.984	0.978	0.985	0.986
28	0.979	0.980	0.978	0.976	0.976	0.973	0.983	0.983	0.977	0.984	0.985
30	0.978	0.978	0.976	0.975	0.974	0.972	0.982	0.982	0.975	0.983	0.984

* For references see p. 4-96.
[t] Cusp at 6.8; volume 0.996.
[u] Cusp at 11.0; volume 0.991.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	In-Pb system [36]					Li-Mg system [36]						Martensite [13]
	100 In	75 In 25 Pb	50 In 50 Pb	25 In 75 Pb	100 Pb	100 Li	80 Li 20 Mg	60 Li 40 Mg	40 Li 60 Mg	20 Li 80 Mg	100 Mg	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.995	0.995	0.995	0.995	0.995	0.982	0.987	0.990	0.992	0.993	0.994	0.998
4	0.990	0.990	0.990	0.990	0.990	0.967	0.975	0.980	0.984	0.985	0.988	0.997
6	0.985	0.985	0.985	0.985	0.986	0.954	0.963	0.970	0.977	0.978	0.983	0.996
8	0.981	0.980	0.980	0.981	0.982	0.940	0.952	0.961	0.969	0.971	0.977	0.995
10	0.976	0.975	0.975	0.977	0.978	0.927	0.941	0.953	0.962	0.965	0.973	0.994
12	0.972	0.971	0.971	0.972	0.974	0.915	0.931	0.944	0.955	0.959	0.968	0.992
14	0.968	0.966	0.967	0.968	0.970	0.904	0.921	0.936	0.948	0.953	0.963	0.991
16	0.963	0.962	0.963	0.965	0.966	0.892	0.911	0.928	0.942	0.947	0.958	0.990
18	0.959	0.958	0.959	0.961	0.962	0.882	0.902	0.920	0.935	0.941	0.953	0.989
20	0.955	0.954	0.955	0.957	0.958	0.872	0.893	0.914	0.929	0.935	0.949	0.987
22	0.952	0.950	0.952	0.954	0.954	0.862	0.885	0.906	0.924	0.930	0.944	0.986
24	0.948	0.947	0.948	0.950	0.951	0.853	0.877	0.900	0.918	0.925	0.940	0.985
26	0.944	0.943	0.945	0.947	0.947	0.845	0.869	0.894	0.913	0.920	0.936	0.984
28	0.940	0.939	0.941	0.943	0.944	0.835	0.862	0.888	0.908	0.915	0.932	0.983
30	0.937	0.936	0.938	0.940	0.941	0.828	0.855	0.882	0.903	0.910	0.929	0.982
32	0.933	0.933	0.934	0.937	0.937	0.820	0.848	0.877	0.899	0.906		
34	0.930	0.930	0.931	0.934	0.935	0.813	0.841	0.872	0.895	0.902		
36	0.927	0.927	0.928	0.931	0.932	0.807	0.835	0.866	0.890	0.898		
38	0.923	0.923	0.925	0.928	0.929	0.800	0.830	0.861	0.887	0.894		
40	0.921	0.921	0.922	0.925	0.927	0.794	0.825	0.856	0.884	0.890		

* For references see p. 4-96.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	35% Ni 65% Fe [13]	Ni-Mn system [33]		Ni-Si system 33]		Nirex [13]	Pb-Sb system [36]					
		100 Ni	71.0 Ni 29.0 Mn	100 Ni	94.2 Ni 5.8 Si		100 Pb	80 Pb 20 Sb	60 Pg 40 Sb	40 Pb 60 Sb	20 Pb 80 Sb	100 Sb
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.998	0.999	0.998	0.999	0.998	0.998	0.995	0.995	0.995	0.995	0.995	0.995
4	0.996	0.998	0.997	0.998	0.997	0.997	0.990	0.990	0.990	0.990	0.991	0.990
6	0.994	0.997	0.995	0.997	0.996	0.996	0.986	0.985	0.986	0.985	0.986	0.985
8	0.992	0.996	0.994	0.996	0.995	0.994	0.982	0.980	0.982	0.980	0.982	0.980
10	0.990	0.995	0.993	0.995	0.994	0.993	0.978	0.976	0.977	0.976	0.978	0.976
12	0.988	0.994	0.991	0.994	0.993	0.992	0.974	0.972	0.973	0.972	0.973	0.972
14	0.986	0.992	0.990	0.992	0.992	0.991	0.970	0.968	0.969	0.968	0.969	0.967
16	0.985	0.991	0.989	0.991	0.991	0.990	0.966	0.964	0.965	0.964	0.965	0.963
18	0.983	0.990	0.987	0.990	0.990	0.989	0.962	0.960	0.961	0.960	0.962	0.959
20	0.982	0.989	0.986	0.989	0.989	0.988	0.958	0.956	0.957	0.957	0.958	0.955
22	0.981	0.988	0.985	0.988	0.988	0.987	0.955	0.953	0.953	0.953	0.955	0.951
24	0.979	0.987	0.983	0.987	0.987	0.986	0.951	0.949	0.950	0.950	0.951	0.947
26	0.978	0.986	0.982	0.986	0.986	0.985	0.948	0.946	0.946	0.947	0.948	0.944
28	0.977	0.985	0.981	0.985	0.985	0.985	0.944	0.943	0.943	0.943	0.945	0.940
30	0.975	0.984	0.979	0.984	0.985	0.984	0.941	0.940	0.940	0.941	0.941	0.937
32	.....	.....	.....	.....	.....	.....	0.933	0.937	0.936	0.938	0.938	0.933
34	.....	.....	.....	.....	.....	.....	0.935	0.934	0.933	0.935	0.936	0.930
36	.....	.....	.....	.....	.....	.....	0.932	0.931	0.930	0.932	0.933	0.927
38	.....	.....	.....	.....	.....	.....	0.929	0.928	0.927	0.929	0.930	0.925
40	.....	.....	.....	.....	.....	.....	0.927	0.925	0.925	0.927	0.928	0.922

* For references see p. 4-96.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Pb-Sn system [36]					Pb-Zn system [36]			SbSn [13]	Sb_2Tl_7 [13]
	100 Pb	75 Pb 25 Sn	50 Pb 50 Sn	25 Pb 75 Sn	100 Sn	100 Pb	50 Pb 50 Zn	100 Zn		
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.995	0.995	0.996	0.996	0.996	0.995	0.996	0.997	0.995	0.994
4	0.990	0.990	0.991	0.992	0.992	0.990	0.992	0.993	0.991	0.988
6	0.986	0.986	0.987	0.988	0.988	0.986	0.988	0.990	0.987	0.983
8	0.982	0.982	0.983	0.984	0.985	0.982	0.984	0.987	0.983	0.978
10	0.978	0.978	0.979	0.980	0.981	0.978	0.980	0.985	0.979	0.973
12	0.974	0.975	0.975	0.977	0.978	0.974	0.976	0.982	0.976	0.968
14	0.970	0.971	0.972	0.973	0.975	0.970	0.972	0.978	0.972	0.964
16	0.966	0.967	0.968	0.970	0.972	0.966	0.969	0.976	0.969	0.959
18	0.962	0.964	0.965	0.966	0.968	0.962	0.965	0.973	0.966	0.955
20	0.958	0.960	0.962	0.963	0.965	0.958	0.962	0.970	0.962	0.951
22	0.955	0.957	0.958	0.960	0.962	0.955	0.959	0.967	0.959	0.947
24	0.951	0.953	0.956	0.957	0.959	0.951	0.955	0.965	0.956	0.943
26	0.948	0.950	0.953	0.953	0.956	0.948	0.952	0.962	0.953	0.939
28	0.944	0.947	0.950	0.950	0.953	0.944	0.949	0.959	0.950	0.935
30	0.941	0.943	0.947	0.948	0.951	0.941	0.946	0.957	0.947	0.932
32	0.938	0.940	0.944	0.945	0.948	0.938	0.943	0.954		
34	0.935	0.937	0.942	0.942	0.945	0.935	0.941	0.952		
36	0.932	0.934	0.939	0.940	0.943	0.932	0.938	0.950		
38	0.929	0.932	0.937	0.937	0.941	0.929	0.935	0.947		
40	0.927	0.929	0.934	0.935	0.939	0.927	0.933	0.945		

* For references see p. 4-96.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Sn-Zn system [36]					Stainless steel [13]		Tl-Bi system [38]				
	100 Sn	80 Sn 20 Zn	50 Sn 50 Zn	20 Sn 80 Zn	100 Zn	H26‡	H29§	100 Tl	80 Tl 20 Bi	50 Tl 50 Bi	20 Tl 80 Bi	100 Bi
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.996	0.996	0.996	0.996	0.996	0.999	0.999	0.994	0.994	0.994	0.994	0.993
4	0.992	0.992	0.993	0.993	0.993	0.997	0.997	0.989	0.989	0.989	0.989	0.987
6	0.988	0.989	0.990	0.989	0.990	0.996	0.996	0.984	0.984	0.984	0.983	0.981
8	0.984	0.985	0.986	0.986	0.987	0.995	0.995	0.979	0.979	0.979	0.978	0.976
10	0.981	0.981	0.983	0.982	0.983	0.994	0.994	0.974	0.974	0.974	0.974	0.970
12	0.977	0.978	0.979	0.979	0.980	0.993	0.992	0.969	0.969	0.969	0.968	0.965
14	0.974	0.974	0.976	0.976	0.977	0.992	0.991	0.964	0.965	0.965	0.964	0.961
16	0.970	0.971	0.973	0.973	0.975	0.990	0.990	0.960	0.960	0.960	0.960	0.956
18	0.967	0.968	0.970	0.970	0.972	0.989	0.989	0.955	0.956	0.956	0.955	0.952
20	0.964	0.965	0.967	0.967	0.969	0.988	0.988	0.951	0.951	0.952	0.951	0.948
22	0.961	0.962	0.963	0.963	0.966	0.987	0.986	0.947	0.947	0.948	0.947	0.944
24	0.958	0.958	0.960	0.961	0.963	0.986	0.985	0.943	0.943	0.944	0.942	0.940
											v	*c*
26	0.955	0.956	0.957	0.958	0.961	0.985	0.984	0.938	0.939	0.940	0.902	0.902
28	0.952	0.953	0.954	0.955	0.958	0.984	0.983	0.934	0.936	0.936	0.898	0.899
30	0.950	0.950	0.952	0.952	0.956	0.983	0.982	0.930	0.932	0.933	0.895	0.896
32	0.947	0.947	0.949	0.950	0.953	.....	.....	0.926	0.928	0.930	0.892	0.893
34	0.945	0.945	0.947	0.947	0.951	.....	.....	0.923	0.925	0.926	0.889	0.890
36	0.942	0.942	0.944	0.945	0.949	.....	.....	0.919	0.922	0.923	0.886	0.887
38	0.940	0.940	0.942	0.942	0.947	.....	.....	0.915	0.918	0.920	0.883	0.885
40	0.938	0.938	0.939	0.940	0.945	.....	.....	0.912	0.915	0.917	0.881	0.882

* For references see p. 4-96.
‡ Stainless steel H26: 0.094 C, 0.36 Mn, 0.023 P, 0.022 S, 0.35 Si, 12.26 Cr, 0.46 Ni, 0.50 Mo, N.D. Cu.
§ Stainless steel H29: 0.058 C, 0.70 Mn, 0.030 P, 0.013 S, 0.85 Si, 18.51 Cr, 8.95 Ni, N.D. Mo, 0.20 Cu.
v Volumes at 24.5: phase I = 0.942, phase II = 0.921, phase III = 0.905.
c Transition in this region.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Tl-Cd system [38]						Tl-In system [38]				
	100 Tl	80 Tl 20 Cd	60 Tl 40 Cd	40 Tl 60 Cd	20 Tl 80 Cd	100 Cd	100 Tl	77 Tl 23 In	50 Tl 50 In	20 Tl 80 In	100 In
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.994	0.995	0.995	0.995	0.996	0.995	0.994	0.994	0.995	0.995	0.995
4	0.989	0.990	0.990	0.990	0.991	0.991	0.989	0.988	0.990	0.990	0.990
6	0.984	0.985	0.986	0.986	0.987	0.987	0.984	0.983	0.985	0.985	0.985
8	0.979	0.980	0.981	0.981	0.983	0.983	0.979	0.977	0.980	0.980	0.981
10	0.974	0.975	0.977	0.977	0.979	0.979	0.974	0.973	0.975	0.975	0.976
12	0.969	0.970	0.972	0.972	0.975	0.976	0.969	[a] 0.962	0.971	0.970	0.972
14	0.964	0.965	0.968	0.968	0.971	0.972	0.964	0.958	0.966	0.966	0.967
16	0.960	0.960	0.963	0.963	0.967	0.969	0.960	0.954	0.962	0.961	0.963
18	0.955	0.956	0.959	0.960	0.963	0.966	0.955	0.950	0.958	0.957	0.958
20	0.951	0.952	0.955	0.956	0.959	0.962	0.951	0.945	0.954	0.953	0.954
22	0.947	0.948	0.951	0.952	0.956	0.959	0.947	0.941	0.950	0.949	0.950
24	0.943	0.944	0.947	0.948	0.952	0.956	0.943	0.937	0.946	0.945	0.946
26	0.938	0.940	0.943	0.945	0.949	0.953	0.938	0.933	0.942	0.942	0.943
28	0.934	0.936	0.940	0.941	0.946	0.950	0.934	0.930	0.938	0.938	0.939
30	0.930	0.933	0.936	0.938	0.942	0.948	0.930	0.926	0.934	0.935	0.936
32	0.926	0.930	0.932	0.934	0.939	0.945	0.926	0.923	0.931	0.932	0.932
34	0.923	0.926	0.929	0.932	0.936	0.942	0.923	0.920	0.927	0.928	0.929
36	0.919	0.923	0.925	0.928	0.933	0.940	0.918	0.916	0.924	0.925	0.926
38	0.915	0.921	0.922	0.926	0.931	0.937	0.915	0.913	0.921	0.922	0.922
40	0.912	0.918	0.919	0.923	0.928	0.935	0.912	0.910	0.918	0.919	0.920

* For references see p. 4-96.

[a] Transition at 11.5: volumes 0.969 and 0.963.

TABLE 4d-10. V/V_0 OF ALLOYS AND INTERMETALLIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Tl-Pb system [38]						Tl-Sn system [38]					
	100 Tl	80 Tl 20 Pb	60 Tl 40 Pb	40 Tl 60 Pb	20 Tl 80 Pb	100 Pb	100 Tl	80 Tl 20 Sn	60 Tl 40 Sn	40 Tl 60 Sn	20 Tl 80 Sn	100 Sn
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.994	0.994	0.995	0.995	0.995	0.995	0.994	0.994	0.995	0.995	0.996	0.996
4	0.989	0.989	0.990	0.990	0.990	0.990	0.989	0.989	0.991	0.991	0.992	0.992
6	0.984	0.984	0.985	0.986	0.986	0.986	0.984	0.984	0.987	0.986	0.987	0.988
8	0.979	0.979	0.981	0.981	0.981	0.982	0.979	0.979	0.982	0.982	0.984	0.985
10	0.974	0.974	0.976	0.977	0.977	0.977	0.974	0.975	0.978	0.978	0.980	0.981
12	0.969	0.970	0.972	0.972	0.973	0.973	0.969	0.970	0.973	0.973	0.976	0.977
14	0.964	0.965	0.967	0.968	0.968	0.969	0.964	0.966	0.969	0.970	0.972	0.974
16	0.960	0.961	0.963	0.963	0.964	0.965	0.960	0.961	0.965	0.966	0.969	0.971
18	0.955	0.956	0.958	0.959	0.961	0.962	0.955	0.957	0.961	0.962	0.966	0.968
20	0.951	0.952	0.954	0.955	0.957	0.958	0.951	0.953	0.957	0.959	0.962	0.964
22	0.947	0.948	0.950	0.951	0.953	0.954	0.947	0.949	0.953	0.955	0.959	0.961
24	0.943	0.945	0.947	0.947	0.949	0.951	0.943	0.945	0.950	0.952	0.956	0.958
26	0.938	0.940	0.942	0.943	0.945	0.947	0.938	0.942	0.946	0.949	0.953	0.956
28	0.934	0.937	0.938	0.939	0.942	0.944	0.934	0.938	0.942	0.946	0.950	0.953
30	0.930	0.933	0.935	0.935	0.938	0.941	0.930	0.935	0.939	0.942	0.947	0.950
32	0.926	0.929	0.931	0.932	0.935	0.938	0.926	0.931	0.936	0.939	0.944	0.947
34	0.923	0.926	0.928	0.928	0.931	0.935	0.923	0.928	0.932	0.936	0.941	0.945
36	0.919	0.923	0.924	0.925	0.928	0.933	0.919	0.925	0.929	0.933	0.938	0.943
38	0.915	0.920	0.921	0.922	0.925	0.930	0.915	0.922	0.926	0.931	0.936	0.941
40	0.912	0.917	0.918	0.919	0.922	0.927	0.912	0.919	0.923	0.928	0.933	0.938

* For references see p. 4-96.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS*

Pressure, kilobars	Ethyl acetate [3]	Acenapathylene [24]	Acetone [23]	Ethyl alcohol [23]	Methyl alcohol [23]	Propyl alcohol [23]	c-Propyl alcohol [26]	n-Amyl iodide [25]	Amyl alcohol [23]	n-Amyl bromide [25]	n-Amyl chloride [25]	n-Amyl ether [24]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.887	0.975	0.885	0.893	0.892	0.895	0.906	0.915	0.888	0.907	0.892	0.888
4	0.830	0.955	0.831	0.831	0.836	0.854	0.853	0.860	0.842	0.860	0.844	0.843
6	0.795	0.937	0.795	0.795	0.797	0.825	0.820	0.830	0.816	0.828	0.815	0.810
8	0.770	0.923	0.768	0.769	0.771	0.802	0.798	0.806	0.796	0.802	0.792	0.786
10	0.750	0.910	.....	0.749	0.752	0.785	0.780	0.787	0.777	0.782	0.773	0.766
12	0.736	0.899	.....	0.735	0.737	0.769	.....	.....	0.761	.....	.....	[a]
14	0.724	0.888	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.728
16	0.713	0.879	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.719
18	0.704	0.871	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.710
20	0.695	0.863	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.702
22	0.687	0.856	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.695
24	0.680	0.849	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.688
26	0.672	0.843	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.680
28	0.666	0.838	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.674
30	0.660	0.832	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.668
32	0.654	0.827	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.662
34	0.649	0.822	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.657
36	0.643	0.818	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.652
38	0.639	0.813	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.647
40	0.635	0.808	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.643
												0.639

* For references see p. 4-96.
[a] Freezes at 10.8; volumes 0.776 and 0.755.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Nitroaniline [5]			Anthracene [24]	Anthraquinone [6]	Benzene [24]	Bromobenzene [26]	Chlorobenzene [24]	Diphenylbenzene [5]			Hexaethylbenzene [24]
	ortho-	meta-	para-						ortho-	meta-	para-	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.983	0.980	0.977	0.972	0.978	0.857	0.930	0.835	0.974	0.974	0.974	0.980
4	0.967	0.964	0.960	0.951	0.961	0.805	.....	0.830	0.950	0.950	0.950	0.960
6	0.952	0.948	0.944	0.935	0.947	0.770	.....	0.834	0.930	0.931	0.931	0.940
								[b]				
8	0.939	0.935	0.931	0.920	0.935	0.745	.....	0.784	0.912	0.917	0.917	0.923
10	0.928	0.924	0.920	0.910	0.924	0.725	.....	0.772	0.896	0.905	0.905	0.908
12	0.917	0.913	0.910	0.898	0.915	0.712	.....	0.759	0.884	0.893	0.894	0.895
14	0.907	0.903	0.900	0.888	0.906	0.700	.....	0.748	0.872	0.883	0.884	0.883
16	0.898	0.895	0.892	0.880	0.898	0.699	.....	0.738	0.862	0.874	0.875	0.872
18	0.890	0.887	0.884	0.872	0.890	0.682	.....	0.730	0.852	0.865	0.867	0.862
20	0.883	0.880	0.877	0.865	0.883	0.675	.....	0.722	0.845	0.857	0.860	0.853
22	0.876	0.872	0.869	0.857	0.877	0.667	.....	0.715	0.837	0.849	0.853	0.845
24	0.870	0.866	0.863	0.851	0.871	0.660	.....	0.708	0.830	0.842	0.846	0.837
26	0.865	0.860	0.857	0.845	.....	0.654	.....	0.703	0.823	0.835	0.840	0.830
28	0.859	0.854	0.851	0.838	.....	0.648	.....	0.697	0.817	0.829	0.834	0.823
												[c]
30	0.853	0.848	0.845	0.832	.....	0.644	.....	0.692	0.812	0.824	0.830	0.807
32	0.849	0.843	0.840	0.827	.....	0.638	.....	0.687	0.805	0.818	0.823	0.802
34	0.845	0.838	0.835	0.822	.....	0.634	.....	0.683	0.800	0.813	0.818	0.798
36	0.840	0.833	0.830	0.817	.....	0.630	.....	0.679	0.796	0.808	0.814	
38	0.837	0.829	0.826	0.812	.....	0.625	.....	0.675	0.792	0.805	0.809	
40	0.832	0.825	0.821	0.808	.....	0.622	.....	0.672	0.789	0.801	0.805	

* For references see p. 4-96.

[b] Freezes at 7.4; volumes 0.817 and 0.788.

[c] Sluggish transition here, not complete.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Nitrobromobenzene [5]			Nitrochlorobenzene [5]		Nitroiodobenzene [5]			Aminobenzenesulfonic acid [5]			Benzil [5]
	ortho-	meta-	para-	ortho-	para-	ortho-	meta-	para-	ortho-	meta-	para-	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.970	0.980	0.975	0.970	0.970	0.973	0.975	0.975	0.983	0.987	0.985	0.953
				e							*f*	
4	0.950	0.962	0.957	0.944	0.949	0.953	0.957	0.956	0.968	0.976	0.949	0.925
6	0.935	0.946	0.942	0.920	0.930	0.937	0.942	0.940	0.955	0.965	0.935	0.904
	d											
8	0.915	0.933	0.928	0.902	0.915	0.923	0.928	0.926	0.943	0.956	0.916	0.888
10	0.898	0.923	0.915	0.888	0.903	0.910	0.916	0.914	0.932	0.947	0.902	0.874
											g	
12	0.885	0.911	0.905	0.875	0.890	0.899	0.905	0.903	0.922	0.940	0.885	0.865
14	0.873	0.901	0.895	0.965	0.880	0.888	0.895	0.893	0.913	0.934	0.873	0.855
16	0.863	0.892	0.886	0.855	0.871	0.879	0.887	0.885	0.905	0.928	0.862	0.846
18	0.855	0.885	0.877	0.846	0.862	0.870	0.879	0.877	0.897	0.922	0.852	0.838
20	0.847	0.877	0.868	0.839	0.853	0.863	0.871	0.869	0.890	0.918	0.843	0.831
22	0.840	0.870	0.862	0.832	0.846	0.855	0.864	0.862	0.883	0.913	0.835	0.824
24	0.832	0.864	0.855	0.825	0.839	0.848	0.857	0.855	0.876	0.908	0.828	0.818
26	0.827	0.858	0.848	0.819	0.831	0.842	0.851	0.849	0.871	0.904	0.821	0.812
28	0.821	0.952	0.842	0.813	0.825	0.836	0.845	0.843	0.865	0.900	0.815	0.808
30	0.816	0.846	0.836	0.810	0.820	0.831	0.840	0.838	0.861	0.897	0.810	0.813
32	0.810	0.841	0.831	0.804	0.814	0.825	0.835	0.833	0.856	0.893	0.805	0.800
34	0.806	0.837	0.825	0.799	0.809	0.820	0.830	0.827	0.852	0.889	0.801	0.796
36	0.802	0.832	0.820	0.795	0.804	0.815	0.826	0.823	0.848	0.886	0.797	0.793
38	0.798	0.828	0.814	0.792	0.800	0.811	0.822	0.817	0.845	0.883	0.793	0.790
40	0.793	0.825	0.810	0.787	0.795	0.807	0.818	0.814	0.841	0.880	0.790	0.787

* For references see p. 4-96.
d Transition at 7.3; volumes 0.926 and 0.920.
e Transition at 3.9; volumes 0.952 and 0.945.
f Transition at 3.9; volumes 0.973 and 0.962.
g Transition at 11.2; volumes 0.894 and 0.892.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure kilobars	Aminobenzoic acid [5]			Bromobenzoic acid [5]			Chlorobenzoic acid [5]			Iodobenzoic acid [5]		
	ortho-	meta-	para-	ortho-	meta-	para-	ortho-	meta-	para-	ortho-	meta-	para-
0	1.000	1.000	1.000	1.000	1 000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.981	0.986	0.981	0.980	0 975	0.980	0.977	0.977	0.977	0.977	0.979	0.978
4	0.964	0.975	0.964	0.961	0 953	0.961	0.958	0.958	0.958	0.957	0.960	0.960
6	0.947	0.965	0.947	0.945	0 935	0.945	0.942	0.942	0.942	0.940	0.941	0.944
8	0.932	0.957	0.932	0.930	0 929	0.930	0.928	0.927	0.927	0.927	0.927	0.931
10	0.918	0.949	0.918	0.917	0 907	0.917	0.915	0.915	0.915	0.916	0.914	0.919
12	0.907	0.942	0.907	0.907	0 894	0.907	0.905	0.903	0.903	0.905	0.903	0.908
14	0.896	0.935	0.896	0.897	0 883	0.897	0.895	0.893	0.893	0.895	0.893	0.898
16	0.887	0.929	0.887	0.888	0 874	0.888	0.886	0.883	0.884	0.887	0.884	0.889
18	0.878	0.923	0.878	0.880	0 865	0.880	0.878	0.875	0.876	0.880	0.875	0.880
20	0.871	0.918	0.872	0.872	0 857	0.872	0.870	0.867	0.869	0.872	0.868	0.872
22	0.863	0.912	0.863	0.860	0 849	0.860	0.862	0.860	0.862	0.865	0.860	0.865
24	0.856	0.907	0.856	0.858	0 842	0.858	0.855	0.853	0.855	0.859	0.854	0.857
26	0.850	0.903	0.850	0.852	0 836	0.852	0.849	0.846	0.849	0.853	0.847	0.850
28	0.845	0.898	0.845	0.846	0 830	0.846	0.843	0.840	0.843	0.847	0.841	0.844
30	0.840	0.895	0.840	0.841	0 824	0.841	0.838	0.833	0.837	0.842	0.837	0.838
32	0.835	0.890	0.834	0.835	0 818	0.835	0.832	0.827	0.831	0.837	0.830	0.831
34	0.831	0.886	0.829	0.830	0 813	0.830	0.827	0.822	0.825	0.832	0.825	0.826
36	0.827	0.883	0.825	0.825	0.808	0.825	0.823	0.817	0.820	0.827	0.821	0.821
38	0.823	0.880	0.821	0.820	0.804	0.820	0.818	0.812	0.816	0.823	0.816	0.816
40	0.820	0.877	0.817	0.816	0.800	0.816	0.814	0.807	0.812	0.819	0.812	0.811

* For references see p. 4-96.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Benzophenone [6]	Bibenzyl [24]	Bromoform [26]	2,2-Dimethylbutane [26]	2,3-Dimethylbutane [26]	Isobutyl alcohol [23]	*n*-Butyl alcohol [26]	*n*-Butyl bromide [25]	*n*-Butyl chloride [25]	*n*-Butyl iodide [25]	*d*-Camphor [5]	Carbon disulfide [23]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.972	0.957	0.902	0.904	0.869	0.878	0.913	0.900	0.893	0.912	0.950	0.892
											h	
4	0.950	0.930	.....	0.846	0.816	0.833	0.867	0.853	0.841	0.862	0.873	0.842
6	0.932	0.909	.....	0.807	0.782	0.802	....	0.819	0.807	0.830	0.855	0.808
8	0.917	0.892	.....	.....	.....	0.777	....	0.794	0.783	0.805	0.841	0.781
10	0.902	0.877	.....	.....	.....	0.758	....	0.775	0.763	0.785	0.828	0.712
12	0.890	0.865	.....	.....	.....	0.743	....	0.760	.....	0.766	0.817	0.762
14	0.879	0.853	.....	.....	.....	.....	....	.....	.....	.....	0.808	0.745
16	0.869	0.842	.....	.....	.....	.....	....	.....	.....	.....	0.800	
18	0.860	0.833	.....	.....	.....	.....	....	.....	.....	.....	0.791	
20	0.850	0.824	.....	.....	.....	.....	....	.....	.....	.....	0.783	
22	0.842	0.815	.....	.....	.....	.....	....	.....	.....	.....	0.777	
24	0.835	0.808	.....	.....	.....	.....	....	.....	.....	.....	0.770	
26	.....	0.801	.....	.....	.....	.....	....	.....	.....	.....	0.764	
28	.....	0.795	.....	.....	.....	.....	....	.....	.....	.....	0.758	
30	.....	0.789	.....	.....	.....	.....	....	.....	.....	.....	0.752	
32	.....	0.783	.....	.....	.....	.....	....	.....	.....	.....	0.747	
34	.....	0.728	.....	.....	.....	.....	....	.....	.....	.....	0.743	
36	.....	0.723	.....	.....	.....	.....	....	.....	.....	.....	0.738	
38	.....	0.718	.....	.....	.....	.....	....	.....	.....	.....	0.733	
40	.....	0.714	.....	.....	.....	.....	....	.....	.....	.....	0.729	

* For references see p. 4-96.

[h] Transition at 3.5; volumes 0.925 and 0.877.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Carbon tetrachloride [26]	Dicresyl carbonate [5]			Chloroacetanilide [5]			Chloroform [24]	Methylnitrocinnamate [5]			Cumene [24]
		ortho-	meta-	para-	ortho-	meta-	para-		ortho-	meta-	para-	
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.885	0.975	0.975	0.975	0.976	0.976	0.978	0.892	0.974	0.974	0.977	0.901
4	.....	0.952	0.952	0.953	0.955	0.955	0.961	0.841	0.953	0.956	0.958	0.850
								i				
6	.....	0.932	0.932	0.937	0.935	0.936	0.945	0.743	0 937	0.940	0.943	0.822
8	.....	0.915	0.915	0.922	0.916	0.919	0.931	0.727	0 922	0.926	0.928	0.800
10	.....	0.900	0.901	0.909	0.898	0.902	0.918	0.715	0 910	0.914	0.916	0.783
12	.....	0.887	0.889	0.892	0.885	0.890	0.907	0.704	0 899	0.903	0.905	0.768
14	.....	0.876	0.877	0.887	0.873	0.878	0.897	0.694	0 889	0.893	0.895	0.755
16	.....	0.866	0.868	0.877	0.861	0.867	0.887	0.685	0 880	0.883	0.885	0.744
18	.....	0.857	0.858	0.868	0.852	0.858	0.878	0.677	0 871	0.874	0.876	0.734
20	.....	0.849	0.850	0.860	0.844	0.849	0.870	0.670	0 863	0.866	0.869	0.725
22	.....	0.842	0.842	0.853	0.835	0.842	0.863	0.663	0 856	0.858	0.861	0.717
24	.....	0.835	0.835	0.846	0.827	0.834	0.857	0.657	0 848	0.851	0.854	0.710
26	.....	0.829	0.829	0.840	0.820	0.828	0.850	0.651	0 842	0.845	0.847	0.702
28	.....	0.823	0.823	0.834	0.814	0.821	0.845	0.646	0 835	0.838	0.842	0.696
30	.....	0.817	0.816	0.828	0.808	0.815	0.838	0.641	0 830	0.833	0.836	0.690
32	.....	0.812	0.810	0.823	0.803	0.810	0.834	0.636	0 824	0.827	0.830	0.685
34	.....	0.807	0.805	0.818	0.798	0.805	0.829	0.632	0 818	0.822	0.825	0.680
36	.....	0.802	0.799	0.814	0.793	0.800	0.825	0.627	0 813	0.817	0.821	0.676
38	.....	0.797	0.794	0.809	0.789	0.795	0.821	0.623	0 808	0.812	0.816	0.672
40	.....	0.793	0.789	0.805	0.785	0.791	0.817	0.619	0 804	0.808	0.812	0.669

* For references see p. 4-96.

i Freezes at 5.4; volumes, 0.815 and 0.748.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Cyanamide [5]	*n*-Decane [24]	Dextrin [6]	Dextrose [6]	Diethylene glycol [27]	Diphenyl [24]	Diphenyl amine [28]	*n*-Dodecane [24]	Ethyl ether [23]	Ethyl bromide [23]	Ethyl chloride [23]	Ethyl iodide [23]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.985	0.892	0.980	0.990	0.949	0.964	0.964	0.800 [k]	0.859	0.910	0.849	0.877
4	0.971	0.766 [j]	0.964	0.980	0.915	0.939	0.938	0 783	0.790	0.830	0.793	0.835
6	0.959	0.756	0.948	0.972	.....	0.920	0.920	0.770	0.761	0.789	0.761	0.805
8	0.947	0.741	0.935	0.964	.....	0.905	0.914	0.758	0.734	0.766	0.735	0.779
10	0.938	0.728	0.923	0.956	.....	0.891	0.890	0.747	0.714	0.746	0.715	0.758
12	0.928	0.717	0.912	0.949	.....	0.880	0.878	0.737	0.695	0.731	0.695	0.740
14	0.920	0.707	0.903	0.942	.....	0.869	....	0.727				
16	0.911	0.699	0.895	0.935	.....	0.860	....	0.719				
18	0.904	0.690	0.886	0.928	.....	0.850	.....	0.711				
20	0.897	0.684	0.879	0.922	.....	0.842	.....	0.703				
22	0.890	0.677	0.872	0.916	.....	0.834	.....	0.696				
24	0.882	0.672	0.866	0.911	.....	0.827	.....	0.690				
26	0.876	0.666	0.860	.....	.....	0.820	.....	0.684				
28	0.870	0.662	.....	.....	.....	0.813	.....	0.628				
30	0.865	0.657	.....	.....	.....	0.808	.....	0.623				
32	0.859	0.652	.....	.....	.....	0.802	.....	0.618				
34	0.853	0.649	.....	.....	.....	0.797	.....	0.615				
36	0.848	0.645	.....	.....	.....	0.792	.....	0.611				
38	0.843	0.642	.....	.....	.....	0.788	.....	0.607				
40	0.838	0.638	.....	.....	.....	0.784	.....	0.604				

* For references see p. 4-96.
[j] Freezes at 3.0; volumes 0.863 and 0.789.
[k] Freezes at 1.65; volumes 0.916 and 0.813.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Ethylene bromide [5]	Ethylene glycol [27]	Eugenol [27]	Fluoranthene [24]	Fluorene [16]	Glycerin [27]	Guanidine sulfate [5]	*n*-Heptane [24]	3-Methylheptanol-1 [25]	2-Methylheptanol-3 [25]	3-Methylheptanol [25]	2-Methylheptanol-5 [25]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	l											
2	0.829	0.948	0.989	0.971	0.975	0.964	.....	0.865	0.918	0.914	0.916	0.912
4	0.804	0.915	0.978	0.950	0.952	0.935	.....	0.816	0.876	0.865	0.873	0.867
							m					
6	0.782	.....	0.967	0.931	0.933	0.912	0.818	0.799	0.846	.....	0.842	
8	0.765	.....	6.957	0.915	0.917	0.893	0.810	0.755				
10	0.751	.....	0.947	0.901	0.902	0.877	0.803	0.734				
							n	*o*				
12	0.740	.....	0.938	0.890	0.890	0.863	0.792	0.375				
14	0.727	.....	0.930	0.879	0.879	.....	0.786	0.365				
16	0.717	.....	0.923	0.869	0.868	.....	0.780	0.355				
18	0.708	.....	0.916	0.860	0.859	.....	0.775	0.346				
20	0.700	.....	0.910	0.852	0.850	.....	0.770	0.338				
22	0.693	.....	0.904	0.844	0.842	.....	0.765	0.330				
24	0.687	.....	0.898	0.837	0.835	.....	0.762	0.323				
26	0.682	.....	0.893	0.830	0.829	.....	0.757	0.316				
28	0.677	.....	0.887	0.824	0.824	.....	0.754	0.310				
30	0.672	.....	0.883	0.818	0.819	.....	0.750	0.304				
32	0.668	.....	0.878	0.813	0.815	.....	0.747	0.591				
34	0.666	.....	0.873	0.808	0.812	.....	0.744	0.594				
36	0.663	.....	0.870	0.805	0.810	.....	0.741	0.590				
38	0.661	.....	0.866	0.801	0.809	.....	0.738	0.586				
40	0.660	.....	0.862	0.798	0.808	.....	0.735	0.583				

* For references see p. 4-96.

[l] Freezes at 0.5; volumes 0.967 and 0.870.

[m] Three transitions below 4.9.

[n] Transition at 10.3; volumes 0.803 and 0.797.

[o] Freezes at 11.2; volumes 0.722 and 0.680.

TABLE 4d-11 V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	*n*-Hexane [26]	Cyclohexane [24]	Methylcyclohexane [24]	*n*-Hexadecane [24]	Hexamethylenetetramine [5]	*n*-Hexyl alcohol [26]	Iodoform [5]	Isoprene [27]	Levulose [6]	*dl*-Limonene [24]	Ethyl dibenzyl malonate [27]	Melamine [5]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
		p		*t*								
2	0.876	0.862	0.886	0.828	0.980	0.918	0.977	0.860	0.990	0.896	0.929	0.983
4	0.823	0.825	0.840	0.803	0.962	.....	0.955	0.819	0.981	0.853	.....	0.969
6	0.790	0.799	0.810	0.783	0.947	.....	0.937	0.789	0.972	0.826	.....	0.953
		q										
8	.....	0.747	0.786	0.768	0.935	.....	0.922	0.764	0.963	0.806	.....	0.947
10	.....	0.729	0.767	0.755	0.925	.....	0.908	0.743	0.955	0.790	.....	0.938
12	.....	0.715	0.751	0.744	0.915	.....	0.896	0.725	0.947	0.775	.....	0.929
14	.....	0.704	0.737	0.735	0.906	.....	0.885	.....	0.940	0.763	.....	0.921
16	.....	0.694	0.725	0.725	0.898	.....	0.875	.....	0.934	0.752	.....	0.914
18	.....	0.685	0.715	0.717	0.890	.....	0.865	.....	0.927	0.742	.....	0.907
20	.....	0.678	0.706	0.710	0.883	.....	0.857	.....	0.920	0.733	.....	0.900
22	.....	0.672	0.698	0.703	0.876	.....	0.848	.....	0.915	0.725	.....	0.894
24	.....	0.665	0.690	0.697	0.870	.....	0.841	.....	0.909	0.717	.....	0.888
26	.....	0.660	0.684	0.692	0.863	.....	0.833	.....	.....	0.711	.....	0.882
28	.....	0.655	0.677	0.698	0.857	.....	0.827	.....	.....	0.705	.....	0.877
30	.....	0.650	0.672	0.682	0.851	.....	0.820	.....	.....	0.700	.....	0.872
32	.....	0.645	0.666	0.678	0.845	.....	0.815	.....	.....	0.695	.....	0.867
34	.....	0.641	0.660	0.674	0.840	.....	0.809	.....	.....	0.691	.....	0.864
36	.....	0.637	0.655	0.670	0.836	.....	0.804	.....	.....	0.687	.....	0.860
38	.....	0.633	0.650	0.666	0.831	.....	0.799	.....	.....	0.683	.....	0.856
40	.....	0.630	0.646	0.663	0.827	.....	0.794	.....	.....	0.679	.....	0.852

* For references see p. 4-96.

[p] Freezes at 0.3; volumes 0.967 and 0.926. (Volume liquid = 0.977 at 0.2.)

[q] Transition at 7.4; volumes 0.784 and 0.757.

[r] Freezes at 0.4; volumes 0.970 and 0.861.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Menthol [6]	Mesitylene [24]	Triphenylmethane [24]	Methylamine hydrochloride [5]	Methylene chloride [24]	Morpholine hydrogen tartrate [5]	Naphthalene [24]	β-Methylnaphthalene [24]	Tetrahydronaphthalene [24]	*n*-Octane [24]	Isooctane [27]	*n*-Octacosane [24]
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.966	0.909	0.974	0.982	0.910	0.985	0.970	0.965	0.926	0.883	0.893	0.955
		s							*w*			
4	0.941	0.825	0.952	0.967	0.860	0.971	0.946	0.937	0.829	0.828	0.835	0.930
				t						*x*		
6	0.921	0.802	0.935	0.900	0.819	0.959	0.928	0.915	0.813	0.750	0.803	0.912
8	0.905	0.784	0.919	0.890	0.787	0.949	0.912	0.896	0.800	0.725	.....	0.896
10	0.888	0.764	0.906	0.880	0.762	0.939	0.899	0.881	0.788	0.707	.....	0.883
12	0.875	0.756	0.893	0.871	0.744	0.930	0.887	0.868	0.777	0.695	.....	0.872
					v							
14	0.861	0.745	0.883	0.862	0.690	0.922	0.877	0.856	0.768	0.683	.....	0.861
16	0.849	0.735	0.872	0.853	0.678	0.914	0.867	0.845	0.760	0.674	.....	0.851
18	0.837	0.725	0.862	0.845	0.669	0.907	0.858	0.835	0.751	0.665	.....	0.842
20	0.826	0.717	0.854	0.838	0.660	0.900	0.849	0.826	0.744	0.658	.....	0.834
22	0.816	0.710	0.845	0.830	0.652	0.893	0.841	0.818	0.737	0.650	.....	0.826
24	0.806	0.702	0.838	0.823	0.645	0.886	0.833	0.810	0.731	0.645	.....	0.818
				u								
26	.....	0.697	0.832	0.801	0.639	0.880	0.826	0.803	0.725	0.639	.....	0.813
28	.....	0.691	0.825	0.795	0.633	0.874	0.820	0.797	0.720	0.634	.....	0.806
30	.....	0.685	0.819	0.788	0.628	0.869	0.813	0.790	0.715	0.630	.....	0.800
32	.....	0.680	0.814	0.782	0.623	0.864	0.807	0.785	0.710	0.625	.....	0.795
34	.....	0.676	0.809	0.775	0.619	0.858	0.802	0.779	0.706	0.621	.....	0.789
36	.....	0.672	0.804	0.769	0.615	0.854	0.797	0.774	0.702	0.618	.....	0.784
38	.....	0.668	0.800	0.763	0.612	0.849	0.792	0.770	0.798	0.615	.....	0.779
40	.....	0.665	0.796	0.758	0.609	0.845	0.787	0.765	0.795	0.611	.....	0.775

* For references see p. 4-96.

[s] Freezes at 3.4; volumes 0.871 and 0.837.
[t] Transition at 5.4; volumes 0.956 and 0.904.
[u] Transition at 24.8; volumes 0.821 and 0.805.
[v] Freezes at 12.2; volumes 0.741 and 0.701.
[w] Freezes at 2.99; volumes 0.902 and 0.840.
[x] Freezes at 5.4; volumes 0.741 and 0.701.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	*n*-Octadecane [24]	Octanol-3 [25]	Octylene [24]	Methyl oleate [27]	Oxalic acid anhydrous [5]	*n*-Pentane [26]	Isopentane [26]	2-Methylpentane [26]	3-Methylpentane [26]	Phenylenediamine [5]		
										ortho-	meta-	para-
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.966	0.916	0.905	0.932	0.985	0.852	0.857	0.863	0.867	0.977	0.978	0.977
4	0.935	0.871	0.845	.....	0.971	0.802	0.802	0.816	0.813	0.959	0.960	0.959
6	0.913	.....	0.805	.....	0.958	0.765	0.765	0.784	0.780	0.944	0.945	0.944
8	0.895	.....	0.778	.....	0.947	0.738	.....	.....	0.755	0.930	0.932	0.930
10	0.880	.....	0.757	.....	0.937	0.717	.....	.....	0.736	0.918	0.920	0.918
12	0.868	.....	0.742	.....	0.928	.....	.....	.....	.....	0.907	0.910	0.907
14	0.857	.....	0.728	.....	0.920	.....	.....	.....	.....	0.897	0.900	0.897
16	0.846	.....	0.715	.....	0.912	.....	.....	.....	.....	0.888	0.890	0.888
18	0.837	.....	0.705	.....	0.905	.....	.....	.....	.....	0.879	0.882	0.880
20	0.828	.....	0.695	.....	0.898	.....	.....	.....	.....	0.871	0.874	0.873
22	0.820	.....	0.686	.....	0.892	.....	.....	.....	.....	0.864	0.867	0.865
24	0.813	.....	0.678	.....	0.885	.....	.....	.....	.....	0.856	0.860	0.858
26	0.806	.....	0.670	.....	0.880	.....	.....	.....	.....	0.850	0.854	0.852
28	0.800	.....	0.663	.....	0.874	.....	.....	.....	.....	0.844	0.848	0.847
30	0.794	.....	0.657	.....	0.868	.....	.....	.....	.....	0.838	0.843	0.841
32	0.787	.....	0.650	.....	0.863	.....	.....	.....	.....	0.833	0.838	0.836
34	0.782	.....	0.644	.....	0.858	.....	.....	.....	.....	0.828	0.834	0.832
36	0.776	.....	0.638	.....	0.853	.....	.....	.....	.....	0.823	0.830	0.828
38	0.772	.....	0.633	.....	0.849	.....	.....	.....	.....	0.819	0.826	0.824
40	0.767	.....	0.628	.....	0.845	.....	.....	.....	.....	0.816	0.822	0.821

* For references see p. 4-96.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Phenylenediamine hydrochloride [5]			Aminophenol [5]			2,4-Dichlorophenol [5]	Nitrophenol [5]			Tri-*o*-cresyl phosphate [27]	Normal butyl phthalate [27]	*n*-Propyl bromide [25]
	ortho-	meta-	para-	ortho-	meta-	para-		ortho-	meta-	para-			
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.979	0.979	0.979	0.979	0.980	0.982	0.972	0.973	0.980	0.979	0.9478	0.931	0.902
4	0.962	0.962	0.962	0.961	0.963	0.966	0.953	0.950	0.961	0.960	.....	0.892	0.850
6	0.946	0.946	0.946	0.945	0.950	0.952	0.936	0.934	0.946	0.943	.....	0.864	0.812
8	0.932	0.932	0.932	0.932	0.937	0.940	0.923	0.918	0.932	0.929	.....	0.841	0.786
10	0.919	0.919	0.919	0.920	0.926	0.928	0.910	0.905	0.920	0.916	.....	.....	0.766
12	0.908	0.908	0.908	0.911	0.916	0.917	0.899	0.893	0.910	0.905	.....	.....	0.750
14	0.898	0.898	0.898	0.902	0.908	0.908	0.889	0.883	0.900	0.895			
16	0.888	0.890	0.890	0.894	0.900	0.900	0.880	0.873	0.892	0.885			
18	0.880	0.882	0.881	0.886	0.892	0.891	0.871	0.865	0.884	0.877			
20	0.871	0.874	0.873	0.879	0.885	0.884	0.862	0.856	0.876	0.868			
22	0.863	0.867	0.865	0.872	0.879	0.876	0.855	0.849	0.870	0.861			
24	0.856	0.861	0.860	0.866	0.873	0.869	0.847	0.842	0.863	0.854			
26	0.850	0.855	0.854	0.860	0.867	0.862	0.840	0.836	0.857	0.847			
28	0.844	0.849	0.848	0.855	0.862	0.857	0.834	0.830	0.851	0.841			
30	0.838	0.844	0.843	0.849	0.857	0.851	0.828	0.825	0.845	0.835			
32	0.833	0.839	0.838	0.845	0.853	0.846	0.822	0.820	0.840	0.830			
34	0.829	0.835	0.834	0.843	0.849	0.843	0.817	0.816	0.835	0.825			
36	0.824	0.831	0.830	0.836	0.845	0.836	0.812	0.812	0.831	0.821			
38	0.820	0.827	0.825	0.832	0.841	0.831	0.808	0.808	0.827	0.817			
40	0.816	0.823	0.821	0.827	0.837	0.827	0.804	0.804	0.823	0.813			

* For references see p. 4-96.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	*n*-Propyl chloride [25]	*n*-Propyl iodide [25]	Propylene glycol [27]	Quinore [3]	Semicarbazide hydrochloride [5]	Styrene [24]	Succinic acid [6]	Sucrose [6]	Thymol [6]	Toluic acid [5]		
										ortho-	meta-	para-
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.878	0.902	0.943	0.978	0.987	0.907	0.985	0.985	0.966	0.972	0.974	0.972
4	0.831	0.854	0.906	0.957	0.977	[aa] 0.821	0.973	0.972	0.942	0.950	0.953	0.950
6	0.798	0.824	0.877	[y] 0.931	0.967	0.797	0.960	0.961	0.922	0.932	0.936	0.932
8	0.771	0.800	0.855	0.915	0.959	0.779	0.948	0.950	0.905	0.918	0.922	0.916
10	0.750	0.780	0.836	0.900	[z] 0.946	0.764	0.936	0.940	0.890	0.905	0.910	0.902
12	0.734	0.762	0.820	0.886	0.939	0.752	0.925	0.932	0.877	0.894	0.899	0.890
14	.....	.....	.....	0.874	0.932	0.740	0.915	0.924	0.865	0.884	0.888	0.878
16	.....	.....	.....	0.862	0.925	0.731	0.905	0.916	0.855	0.874	0.878	0.868
18	.....	.....	.....	0.852	0.918	0.722	0.896	0.910	0.846	0.865	0.869	0.859
20	.....	.....	.....	0.842	0.912	0.714	0.888	0.903	0.838	0.856	0.860	0.851
22	.....	.....	.....	0.833	0.907	0.707	0.881	0.897	0.830	0.849	0.852	0.843
24	.....	.....	.....	0.825	0.901	0.700	0.874	0.893	0.823	0.841	0.845	0.835
26	.....	.....	.....	0.817	0.896	0.695	.....	0.883	0.817	0.834	0.838	0.829
28	.....	.....	.....	0.810	0.891	0.689	.....	0.854	0.811	0.828	0.832	0.822
30	.....	.....	.....	0.803	0.886	0.684	.....	0.850	0.806	0.822	0.826	0.817
32	.....	.....	.....	0.797	0.882	0.679	.....	.....	.....	0.816	0.820	0.810
34	.....	.....	.....	0.791	0.877	0.674	.....	.....	.....	0.810	0.815	0.805
36	.....	.....	.....	0.786	0.874	0.670	.....	.....	.....	0.806	0.810	0.800
38	.....	.....	.....	0.781	0.869	0.666	.....	.....	.....	0.802	0.806	0.795
40	.....	.....	.....	0.777	0.866	0.662	.....	.....	.....	0.797	0.801	0.790

* For references see p. 4-96.
[y] Transition at 4.4; volumes 0.952 and 0.943.
[z] Transition at 9.3; volumes 0.953 and 0.950.
[aa] Freezes at 3.1; volumes 0.884 and 0.835.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Acetyl toluidine [5]			Toluidine hydrochloride			Nitrourea [5]	Thiourea [5]	Urea nitrate [5]	*n*-Xylene [24]	*o*-Xylene [24]	*p*-Xylene [24]
	ortho-	meta-	para-	ortho-	meta-	para-						
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000 *ff*
2	0.974	0.972	0.974	0.982	0.972	0.969	0.984	0.982 *cc*	0.985	0.903	0.910 *ee*	0.782
4	0.955	0.949	0.955	0.967	0.948	0.945	0.970 *bb*	0.945	0.971	0.856	0.812	0.760
6	0.937	0.930	0.937	0.954	0.930	0.927	0.906	0.931	0.958	0.824, 0.779 *dd*	0.792	0.754
8	0.925	0.913	0.925	0.943	0.913	0.913	0.895	0.918	0.947	0.798, 0.765	0.775	0.730
10	0.912	0.898	0.914	0.932	0.900	0.900	0.884	0.907	0.937	0.752	0.761	0.719
12	0.901	0.885	0.903	0.923	0.888	0.889	0.874	0.897	0.927	0.741	0.749	0.708
14	0.891	0.874	0.894	0.914	0.877	0.879	0.865	0.887	0.918	0.732	0.738	0.699
16	0.882	0.863	0.885	0.906	0.867	0.870	0.857	0.878	0.910	0.723	0.730	0.690
18	0.873	0.853	0.877	0.898	0.858	0.861	0.849	0.870	0.902	0.715	0.726	0.683
20	0.865	0.844	0.869	0.891	0.850	0.854	0.842	0.863	0.895	0.707	0.714	0.676
22	0.858	0.836	0.862	0.885	0.842	0.847	0.835	0.857	0.888	0.700	0.707	0.669
24	0.851	0.828	0.855	0.878	0.835	0.840	0.829	0.850	0.882	0.695	0.702	0.663
26	0.845	0.820	0.849	0.873	0.828	0.834	0.822	0.844	0.876	0.688	0.697	0.658
28	0.838	0.814	0.843	0.867	0.822	0.828	0.817	0.838	0.870	0.683	0.692	0.653
30	0.833	0.807	0.838	0.862	0.816	0.823	0.811	0.832	0.865	0.678	0.687	0.648
32	0.827	0.802	0.833	0.857	0.811	0.818	0.806	0.827	0.860	0.673	0.683	0.644
34	0.822	0.796	0.828	0.852	0.806	0.814	0.802	0.822	0.855	0.668	0.679	0.641
36	0.818	0.791	0.823	0.848	0.801	0.810	0.797	0.817	0.850	0.664	0.676	0.637
38	0.814	0.787	0.820	0.844	0.796	0.806	0.793	0.813	0.846	0.660	0.673	0.634
40	0.810	0.783	0.816	0.840	0.792	0.802	0.790	0.809	0.842	0.656	0.670	0.631

* For references see p. 4-96.

bb Transition at 5.4; volumes 0.961 and 0.909.

cc Transition at 3.5; volumes 0.969 and 0.949.

dd Freezes in this region; first figure for solid, second for liquid.

ee Freezes at 2.3; volumes 0.902 and 0.831.

ff Freezes at 0.3; volumes 0.975 and 0.811.

TABLE 4d-11. V/V_0 OF ORGANIC COMPOUNDS* (*Continued*)

Pressure, kilobars	Triacetin [27]	Tricaproin [26]	Triethanol-amine [25]	Tri-methylene glycol [27]	Tricresyl thiophosphate [5]		Urea [5]	Sodium xylene sulfonate [5]		
					ortho-	para-		ortho-	meta-	para-
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.937	0.929	0.952	0.943	0.973	0.970	0.982	0.982	0.979	0.986
4	0.900	0.885	.....	0.905	0.951	0.947	0.968	0.966	0.961	0.972
							gg			
6	.....	0.855	.....	.....	0.933	0.927	0.890	0.951	0.946	0.960
8	.....	0.832	.....	.....	0.919	0.911	0.878	0.938	0.933	0.959
10	.....	.....	.....	.....	0.906	0.897	0.867	0.927	0.921	0.949
12	.....	.....	.....	.....	0.895	0.885	0.856	0.916	0.910	0.930
14	.....	.....	.....	.....	0.885	0.873	0.847	0.906	0.900	0.922
16	.....	.....	.....	.....	0.875	0.862	0.838	0.897	0.892	0.913
18	.....	.....	.....	.....	0.866	0.852	0.830	0.889	0.883	0.907
20	.....	.....	.....	.....	0.858	0.843	0.823	0.881	0.871	0.900
22	.....	.....	.....	.....	0.850	0.835	0.815	0.874	0.869	0.894
24	.....	.....	.....	.....	0.843	0.827	0.809	0.867	0.862	0.888
26	.....	.....	.....	.....	0.837	0.820	0.803	0.862	0.857	0.882
28	.....	.....	.....	.....	0.830	0.813	0.797	0.855	0.851	0.877
30	.....	.....	.....	.....	0.824	0.807	0.792	0.850	0.845	0.872
32	.....	.....	.....	.....	0.818	0.802	0.787	0.845	0.841	0.868
34	.....	.....	.....	.....	0.813	0.797	0.782	0.839	0.837	0.864
36	.....	.....	.....	.....	0.808	0.792	0.777	0.835	0.832	0.860
38	.....	.....	.....	.....	0.803	0.788	0.773	0.831	0.829	0.856
40	.....	.....	.....	.....	0.799	0.784	0.769	0.827	0.825	0.852

* For references see p. 4-96.
gg Transition at 5.4; volumes 0.959 and 0.895.

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4d-2. High-pressure Compressibilities.[1] The high-pressure 25°C isotherms presented here were calculated from dynamic equation-of-state measurements made at Lawrence Radiation Laboratory, Livermore; Los Alamos Scientific Laboratory; Ballistics Research Laboratory; and in the Soviet Union. The shock-wave data were chosen on the basis of completeness, accuracy, and absence of effects which would tend to introduce large errors into the calculations. The isotherms were all calculated from experimental data compiled in the Compendium of Shock Wave Data [1].

In dynamic high-pressure experiments, a high-pressure shock wave is passed through the material under investigation. The one-dimensional mass and momentum conservation relationships [7]

$$V = V_0\left(1 - \frac{U_p}{U_s}\right) \tag{4d-1}$$

and

$$P = P_0 + \rho_0 U_p U_s \tag{4d-2}$$

were used to calculate the pressure and specific volume behind the shock front from the experientally determined shock-wave velocity U_s and the bulk material velocity (particle velocity) behind the shock front U_p. Hugoniot curves were obtained from

[1] Work performed under the auspices of the U. S. Atomic Energy Commission.

a large number of experiments in which the shock strengths were varied. A *Hugoniot* is defined as the locus of all points that can be reached by shocking a material from a given initial state.

The conversion of the Hugoniot to the 25°C isotherm is done by means of the Grüneisen equation of state $P = P(V,E)$ in the form

$$P_H(V) - P = \gamma(V) \frac{E_H(V) - E}{V} \tag{4d-3}$$

where the subscript H refers to conditions on the Hugoniot, and E_H is calculated from the conservation relationship

$$E_H(V) = E_0 + [P_H(V) + P_0] \frac{V_0 - V}{2} \tag{4d-4}$$

$\gamma(V)$ is the Grüneisen gamma and is assumed to be a function of V only.

Since the 0 K isotherm and isentrope coincide,

$$E_{0\,\mathrm{K}} = -\int_{V_0}^{V} P\,dV \tag{4d-5}$$

and $P_{0\,\mathrm{K}}(V)$ can be calculated as soon as $\gamma(V)$ is known. Several models have been proposed for relating $\gamma(V)$ to the curvature of the 0 K isotherm. Some of them are contained in the formula

$$\gamma(V) = \frac{t-2}{3} - \frac{V}{2} \frac{(d^2/dV^2)(PV^{2t/3})_{0\,\mathrm{K}}}{(d/dV)(PV^{2t/3})} \tag{4d-6}$$

When $t = 0$, a formula derived by Slater [2] is given; $t = 1$ yields a formula proposed by Dugdale and MacDonald [3] and rederived by Rice [4] et al.; and $t = 2$ gives a relationship derived by Zubarev and Vashchenko [5]. Rice et al. have shown that the Dugdale-MacDonald form gives results that are in agreement with thermodynamic data on metals. The Dugdale-MacDonald form was used to calculate the isotherms given here.

Once the 0 K curve and $\gamma(V)$ are calculated, the 25°C isotherm is obtained by adding to the 0 K isotherm the correction obtained from the Grüneisen equation:

$$\begin{aligned} \Delta P(V) &= \gamma(V) \frac{E_{25°\mathrm{C}}(V) - E_{0\,\mathrm{K}}(V)}{V} \\ &= \gamma(V) \int_{0\,\mathrm{K}}^{25°\mathrm{C}} C_V(V) \frac{dT}{V} \\ &\approx \gamma(V) \frac{E_0}{V} \end{aligned} \tag{4d-7}$$

Hugoniot measurements cannot be used indiscriminately for generating hydrostatic isotherms for comparison with static high-pressure work. Careful evaluations of the assumptions and possible sources of error should be made. First, it is important to note that the Grüneisen equation as it is normally derived is based on a model of the crystalline solid state, and its application to a Hugoniot is consistent with this derivation only if the material remains in the same solid phase all along the Hugoniot; i.e., if no phase transitions are encountered on the Hugoniot. The Grüneisen gamma is assumed to be a function of volume only, and this is a good approximation for temperatures at and above the Debye temperature. In addition, the presence of effects of finite yield strength can cause the measured Hugoniot to be offset above the hydro-

static Hugoniot; i.e., the longitudinal stress measured in a shock-wave experiment is not identical with the hydrostatic pressure.

The materials for which isotherms were calculated have a relatively low yield strength so that corrections for finite yield strength are low and can be neglected, with the exception of Al_2O_3. For this material, corrections were applied, and so the Hugoniot data used as inputs were essentially hydrostatic. The temperatures involved are of the order of magnitude or well above the Debye temperatures of the materials. Therefore, the assumption that the Grüneisen gamma is a function of volume only is valid, at least in the solid phase as presented in Table 4d-12. The only part of these calculations that merits serious scrutiny is the use of the model in the situation where melting occurs along the Hugoniot, as it does with the alkali metals at shock pressures less than 100 kilobars. For most materials, the Hugoniot is characterized by a linear relationship between shock and particle velocity. This behavior is characteristic of materials that do not experience a phase transition along the Hugoniot (except for liquids at very low pressures) and is true of almost all metals. Extrapolation of shock velocity versus particle velocity to zero pressure ($U_p = 0$), yields a value of U_s within 5 per cent of that calculated from the ordinary elastic constants for the solid metals at 1 atm. This indicates: either (1) that the change in volume and enthalpy on melting is negligible at high pressures, or (2) that the effect of the change in volume cancels the effect of the change in enthalpy in determining the Hugoniot. At high pressures, experimental evidence indicates that both alternatives are true to some extent. A careful comparison of the Bridgman [6] data and the Hugoniot data reveals no systematic differences that can be attributed to melting on the Hugoniot. Thus, the error in assuming that the isotherm derived from the experimental Hugoniot represents the solid is certainly no worse than ± 5 per cent and probably far less.

Although the values of Grüneisen gamma calculated by the three models mentioned previously differ successively from one another by one-third at zero pressure, the correction to the Hugoniot at low pressures is small, and the uncertainty in gamma does not affect the calculated 0 K curve. At high pressure, the correction is important, but here gamma is reasonably well known. In fact, the values of the three gammas differ by less than 10 per cent in the high-pressure range. Thus, the 0 K curve is probably calculated to ± 5 per cent in pressure in the range of interest.

The experimental measurements are probably precise to ± 2 per cent. Consideration of the errors mentioned previously leads to the conclusion that the calculated 25°C isotherms are probably accurate to ± 5 per cent in pressure, and certainly better than ± 10 per cent.

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TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C

P, kilobars	Li	Be	Na	Mg	Al	K	Ca	Ti	V
5	0.958	.....	0.931	.....	.....	0.878	0.975		
10	0.922	0.992	0.878	0.973	0.987	0.802	0.953	0.990	0.994
15	0.891	0.988	0.837	0.961	0.981	0.747	0.932	0.985	0.991
20	0.864	0.984	0.803	0.949	0.976	0.704	0.912	0.981	0.988
25	0.841	0.980	0.775	0.938	0.970	0.669	0.894	0.976	0.985
30	0.819	0.976	0.750	0.928	0.964	0.640	0.877	0.971	0.982
35	0.800	0.973	0.728	0.918	0.959	0.615	0.861	0.967	0.979
40	0.783	0.969	0.708	0.909	0.954	0.593	0.846	0.963	0.976
45	0.766	0.965	0.691	0.900	0.949	0.574	0.832	0.958	0.973
50	0.751	0.962	0.675	0.891	0.944	0.557	0.819	0.954	0.971
60	0.725	0.955	0.647	0.875	0.935	0.527	0.794	0.946	0.965
70	0.701	0.948	0.622	0.860	0.926	0.502	0.771	0.938	0.960
80	0.680	0.942	0.601	0.847	0.918	0.480	0.750	0.931	0.955
90	0.661	0.935	0.583	0.834	0.910	0.461	0.731	0.924	0.950
100	0.644	0.929	0.566	0.822	0.902	0.445	0.713	0.917	0.945
120	0.614	0.918	0.537	0.800	0.888	0.417	0.680	0.903	0.935
140	0.588	0.906	0.513	0.780	0.875	0.393	0.652	0.891	0.926
160	0.566	0.896	0.492	0.762	0.862	.....	0.626	0.879	0.917
180	0.546	0.886	0.474	0.746	0.851	.....	0.604	0.867	0.909
200	0.528	0.876	0.458	0.731	0.840	.....	0.583	0.857	0.901
220	.....	0.867	.....	0.717	0.830	.....	0.564	0.846	0.893
240	.....	0.858	.....	0.705	0.820	.....	0.547	0.837	0.886
260	.....	0.850	.....	0.693	0.811	.....	0.530	0.827	0.879
280	.....	0.841	.....	0.681	0.802	.....	0.516	0.818	0.872
300	.....	0.834	.....	0.671	0.794	.....	0.502	0.810	0.865
320	.....	0.826	.....	0.661	0.786	.....	0.489	0.802	0.859
340	.....	0.819	.....	0.652	0.778	.....	0.476	0.794	0.853
360	.....	0.812	.....	0.643	0.771	.....	0.465	0.786	0.846
380	.....	0.805	.....	0.634	0.764	.....	.....	0.779	0.841
400	.....	0.798	.....	0.626	0.757	.....	.....	0.772	0.835
420	.....	0.792	.....	0.619	0.751	.....	.....	0.765	0.829
440	.....	0.786	.....	0.612	0.744	.....	.....	0.758	0.824
460	.....	0.780	.....	0.605	0.738	.....	.....	0.752	0.819
480	.....	0.774	.....	0.598	0.732	.....	.....	0.746	0.813
500	.....	0.768	.....	0.591	0.726	.....	.....	0.740	0.808
550	.....	0.755	.....	0.576	0.713	.....	.....	0.725	0.796
600	.....	0.742	.....	.....	0.700	.....	.....	0.712	0.785
650	.....	0.730	.....	.....	0.688	.....	.....	0.700	0.774
700	.....	0.719	.....	.....	0.677	.....	.....	0.688	0.764
750	.....	0.708	.....	.....	0.667	.....	.....	0.677	0.755
800	.....	0.698	.....	.....	0.657	.....	.....	0.666	0.746
850	.....	.....	.....	.....	.....	.....	.....	0.657	0.737
900	.....	.....	.....	.....	.....	.....	.....	0.647	0.729
950	.....	.....	.....	.....	.....	.....	.....	0.638	0.721
1,000	.....	.....	.....	.....	.....	.....	.....	0.630	0.713
1,200	.....	.....	.....	.....	.....	.....	.....	0.599	
1,400	.....	.....	.....	.....	.....	.....	.....	0.573	
1,600	.....	.....	.....	.....	.....	.....	.....	0.550	
1,800	.....	.....	.....	.....	.....	.....	.....	0.530	
2,000	.....	.....	.....	.....	.....	.....	.....	0.512	

TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C (*Continued*)

P, kilobars	Cr	Co	Ni	Cu	Zn	Rb	Zr	Nb	Mo
5	.....	.....	.....	.....	.....	0.838	0.995		
10	.....	.....	.....	.....	.....	0.750	0.990	0.994	0.996
15	0.992	0.993	0.992	09900	.....	0.691	0.985	0.991	0.994
20	0.990	0.990	0.990	0.986	0.970	9.646	0.980	0.989	0.993
25	0.987	0.988	0.987	0.983	0.964	0.611	0.975	0.986	0.991
30	0.985	0.985	0.985	0.980	0.957	0.582	0.970	0.983	0.989
35	0.983	0.983	0.982	0.977	0.951	0.557	0.965	0.980	0.987
40	0.980	0.981	0.980	0.974	0.945	0.536	0.961	0.978	0.986
45	0.978	0.978	0.978	0.971	0.939	0.517	0.956	0.975	0.984
50	0.976	0.976	0.975	0.968	0.934	0.501	0.952	0.972	0.982
60	0.967	0.972	0.971	0.962	0.924	0.472	0.943	0.957	0.979
70	0.967	0.967	0.966	0.956	0.914	0.449	0.935	0.962	0.975
80	0.963	0.963	0.962	0.951	0.905	0.429	0.927	0.958	0.972
90	0.958	0.959	0.958	0.945	0.896	0.411	0.919	0.953	0.969
100	0.954	0.955	0.954	0.940	0.888	0.396	0.911	0.948	0.966
120	0.947	0.947	0.946	0.930	0.873	0.370	0.897	0.939	0.960
140	0.939	0.940	0.938	0.921	0.859	0.349	0.883	0.931	0.954
160	0.932	0.932	0.931	0.912	0.847	.....	0.870	0.922	0.948
180	0.925	0.925	0.924	0.904	0.835	.....	0.857	0.915	0.942
200	0.918	0.919	0.917	0.896	0.825	.....	0.846	0.907	0.937
220	0.912	0.912	0.911	0.889	0.815	.....	0.834	0.900	0.931
240	0.906	0.906	0.904	0.881	0.805	.....	0.824	0.893	0.926
260	0.900	0.900	0.898	0.874	0.797	.....	0.813	0.886	0.921
280	0.894	0.894	0.893	0.868	0.788	.....	0.803	0.879	0.916
300	0.889	0.888	0.887	0.861	0.781	.....	0.794	0.873	0.911
320	0.883	0.883	0.881	0.855	0.773	.....	0.785	0.866	0.906
340	0.878	0.877	0.876	0.849	0.766	.....	0.776	0.866	0.902
360	0.873	0.872	0.871	0.843	0.760	.....	0.767	0.855	0.897
380	0.868	0.867	0.866	0.838	0.753	.....	0.759	0.849	0.893
400	0.864	0.862	0.861	0.832	0.747	.....	0.751	0.845	0.889
420	0.859	0.857	0.857	0.827	0.741	.....	0.744	0.838	0.884
440	0.854	0.853	0.852	0.822	0.736	.....	0.736	0.833	0.880
460	0.850	0.848	0.848	0.817	0.730	.....	0.729	0.823	0.876
480	0.846	0.844	0.843	0.812	0.725	.....	0.722	0.823	0.872
500	0.842	0.839	0.839	0.808	0.720	.....	0.715	0.818	0.868
550	0.832	0.829	0.829	0.797	0.708	.....	0.699	0.806	0.859
600	0.822	0.819	0.820	0.786	0.698	.....	0.684	0.795	0.850
650	0.813	0.810	0.811	0.777	0.688	.....	0.670	0.785	0.841
700	0.805	0.801	0.802	0.768	0.679	.....	0.657	0.775	0.833
750	0.797	0.792	0.794	0.759	0.670	.....	0.644	0.766	0.825
800	0.789	0.784	0.786	0.751	0.662	.....	0.632	0.757	0.818
850	0.782	0.777	0.779	0.743	0.654	.....	0.621	0.748	0.811
900	0.775	0.769	0.772	0.736	0.647	.....	0.611	0.740	0.804
950	0.769	0.762	0.765	0.729	0.640	.....	0.600	0.732	0.797
1,000	0.762	0.755	0.758	0.722	0.634	.....	0.591	0.725	0.790
1,200	0.739	0.730	0.735	0.697	0.611	.....	0.556	.....	0.766
1,400	.....	.....	.....	0.677	0.592	.....	0.527	.....	0.745
1,600	.....	.....	.....	0.658	0.576	.....	.....	.....	0.726
1,800	.....	.....	.....	0.642	0.561	.....	.....	.....	0.709
2,000	.....	.....	.....	0.627	0.548	.....	.....	.....	0.693
2,500	.....	.....	.....	0.596	0.521	.....	.....	.....	0.659
3,000	.....	.....	.....	0.571	.....	.....	.....	.....	0.631
3,500	.....	.....	.....	0.550	.....	.....	.....	.....	0.606
4,000	.....	.....	.....	0.532					
4,500	.....	.....	.....	0.516					

TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C (*Continued*)

P, kilobars	Pd	Ag	Cd	In	Sn	Ta	Pt	Au
10	.....	.....	.....	0.977	0.979	0.995		
15	0.993	0.987	0.973	0.966	0.969	0.993	0.995	0.992
20	0.990	0.982	0.965	0.957	0.960	0.990	0.993	0.990
25	0.988	0.978	0.957	0.947	0.951	0.988	0.991	0.987
30	0.985	0.974	0.950	0.938	0.943	0.985	0.990	0.985
35	0.983	0.970	0.943	0.930	0.935	0.983	0.988	0.982
40	0.981	0.966	0.936	0.922	0.928	0.981	0.986	0.980
45	0.978	0.963	0.930	0.915	0.920	0.978	0.985	0.977
50	0.976	0.959	0.924	0.907	0.914	0.976	0.983	0.975
60	0.972	0.952	0.912	0.894	0.901	0.972	0.980	0.970
70	0.968	0.945	0.901	0.882	0.889	0.967	0.977	0.966
80	0.963	0.939	0.891	0.870	0.878	0.963	0.974	0.962
90	0.959	0.932	0.882	0.859	0.868	0.959	0.971	0.957
100	0.955	0.926	0.873	0.840	0.858	0.955	0.968	0.953
120	0.948	0.915	0.857	0.831	0.841	0.947	0.962	0.945
140	0.941	0.905	0.843	0.814	0.825	0.939	0.956	0.938
160	0.934	0.895	0.829	0.800	0.811	0.932	0.951	0.930
180	0.927	0.886	0.817	0.786	0.798	0.924	0.946	0.923
200	0.921	0.877	0.806	0.774	0.786	0.917	0.941	0.917
220	0.914	0.869	0.796	0.762	0.775	0.911	0.936	0.910
240	0.908	0.861	0.786	0.752	0.764	0.904	0.931	0.904
260	0.903	0.854	0.777	0.742	0.755	0.898	0.927	0.898
280	0.897	0.847	0.768	0.732	0.746	0.892	0.922	0.893
300	0.892	0.840	0.760	0.724	0.737	0.886	0.918	0.887
320	0.887	0.834	0.753	0.715	0.729	0.880	0.913	0.882
340	0.882	0.828	0.746	0.708	0.722	0.875	0.909	0.877
360	0.877	0.822	0.739	0.700	0.715	0.869	0.905	0.871
380	0.872	0.816	0.732	0.693	0.708	0.864	0.901	0.867
400	0.867	0.811	0.726	0.687	0.701	0.859	0.898	0.862
420	0.863	0.806	0.720	0.680	0.695	0.854	0.894	0.857
440	0.859	0.800	0.715	0.674	0.689	0.849	0.890	0.853
460	0.854	0.796	0.709	0.668	0.684	0.844	0.886	0.846
480	0.850	0.791	0.704	0.663	0.678	0.839	0.883	0.844
500	0.846	0.786	0.699	0.657	0.673	0.835	0.880	0.840
550	0.837	0.775	0.687	0.645	0.661	0.823	0.871	0.830
600	0.828	0.765	0.676	0.633	0.649	0.813	0.863	0.821
650	0.819	0.756	0.666	0.623	.....	0.803	0.856	0.812
700	0.811	0.747	0.657	0.613	.....	0.794	0.849	0.804
750	0.803	0.739	0.648	0.604	.....	0.785	0.842	0.796
800	0.796	0.731	0.640	0.595	.....	0.776	0.835	0.789
850	0.789	0.724	0.633	0.587	.....	0.768	0.829	0.781
900	0.782	0.717	0.626	0.580	.....	0.760	0.823	0.775
950	0.776	0.710	0.619	.....	.....	0.752	0.817	0.768
1,000	0.770	0.704	0.613	.....	.....	0.745	0.811	0.762
1,200	0.747	0.681	.....	.....	.....	0.718	0.791	0.739
1,400	0.728	0.662	.....	.....	.....	0.694	0.773	0.719
1,600	0.711	0.645	.....	.....	.....	0.674	0.756	0.702
1,800	.....	0.630	.....	.....	.....	0.655	0.742	0.686
2,000	.....	0.617	.....	.....	.....	.....	0.728	

TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C (*Continued*)

P, kilobars	Tl	Pb	Th	LiF	LiCl	LiBr	LiI	NaF
5	.....	.....	.....	.....	.....	.....	0.985	
10	0.974	0.979	0.982	.....	0.972	0.960	0.971	0.980
15	0.963	0.969	0.973	0.978	0.959	0.942	0.958	0.970
20	0.952	0.960	0.965	0.971	0.947	0.926	0.945	0.061
25	0.942	0.952	0.957	0.964	0.935	0.912	0.933	0.953
30	0.933	0.943	0.950	0.958	0.925	0.898	0.921	0.944
35	0.924	0.936	0.942	0.952	0.914	0.886	0.910	0.936
40	0.915	0.928	0.935	0.946	0.905	0.874	0.899	0.929
45	0.908	0.921	0.929	0.940	0.896	0.863	0.888	0.921
50	0.900	0.914	0.922	0.934	0.887	0.853	0.878	0.914
60	0.886	0.901	0.910	0.924	0.870	0.834	0.859	0.900
70	0.873	0.890	0.898	0.914	0.855	0.817	0.842	0.888
80	0.861	0.878	0.887	0.904	0.841	0.801	0.825	0.876
90	0.850	0.868	0.877	0.895	0.828	0.787	0.809	0.865
100	0.840	0.858	0.867	0.887	0.816	0.773	0.795	0.854
120	0.822	0.841	0.848	0.871	0.794	0.750	0.767	0.834
140	0.805	0.825	0.832	0.857	0.774	0.729	0.743	0.816
160	0.790	0.810	0.816	0.843	0.756	0.711	0.720	
180	0.777	0.797	0.802	0.831	0.740	0.694	0.699	
200	0.765	0.785	0.789	0.820	0.725	0.679	0.680	
220	0.753	0.773	0.777	0.809	0.712	0.666	0.662	
240	0.743	0.763	0.765	0.799	.....	0.653	0.646	
260	0.733	0.753	0.754	0.789	.....	.....	0.631	
280	0.724	0.744	0.744	0.780	.....	.....	0.616	
300	0.715	0.735	0.734	0.772				
320	0.707	0.727	0.725	0.764				
340	0.700	0.719	0.716	0.756				
360	.....	0.712	0.708	0.749				
380	.....	0.705	0.700	0.742				
400	.....	0.698	0.693	0.735				
420	.....	0.692	0.685	0.729				
440	.....	0.686	0.678	0.722				
460	.....	0.680	0.672	0.716				
480	.....	0.674	0.665	0.711				
500	.....	0.669	0.659	0.705				
550	.....	0.656	0.644	0.692				
600	.....	0.645	0.631	0.680				
650	.....	0.634	0.619	0.669				
700	.....	0.624	0.607	0.659				
750	.....	0.615	0.596	0.649				
800	.....	.....	0.586	0.640				
850	.....	.....	0.577					
900	.....	.....	0.568					
950	.....	.....	0.560					
1,000	.....	.....	0.552					

TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C (*Continued*)

P, kilobars	NaCl	NaBr	NaI	KF	KI	RbF	RbCl	RbBr
5	.....	.....	0.976	.....	0.954	.....	.....	0.946
10	0.963	0.958	0.955	0.936	0.916	0.944	0.886	0.903
15	0.946	0.939	0.936	0.910	0.886	0.921	0.849	0.870
20	0.932	0.923	0.918	0.888	0.859	0.901	0.820	0.842
25	0.918	0.907	0.902	0.869	0.837	0.883	0.796	0.818
30	0.905	0.893	0.887	0.852	0.816	0.867	0.775	0.797
35	0.894	0.880	0.873	0.837	0.798	0.852	0.757	0.779
40	0.883	0.868	0.860	0.823	0.782	0.838	0.741	0.762
45	0.873	0.856	0.848	0.811	0.767	0.826	0.727	0.748
50	0.863	0.846	0.836	0.800	0.753	0.814	0.713	0.734
60	0.845	0.826	0.815	0.779	0.729	0.793	0.690	0.710
70	0.829	0.808	0.796	0.761	0.707	0.774	0.671	0.689
80	0.815	0.792	0.778	0.746	0.689	0.757	0.654	0.671
90	0.802	0.777	0.762	0.731	0.672	0.741	0.639	0.655
100	0.789	0.763	0.748	0.719	0.657	0.728	0.625	0.640
120	0.767	0.738	0.721	0.696	0.630	0.703	0.602	0.615
140	0.748	0.717	0.698	0.677	0.608	0.681	.....	0.594
160	0.731	0.698	0.678	0.660	0.588	0.663	.....	0.575
180	0.715	0.680	0.659	0.646	0.571	0.646		
200	0.701	0.665	0.643	0.633	.....	0.631		
220	.....	0.651	0.627	0.621	.....	0.618		
240	.....	0.638	0.613	0.610	.....	0.605		

TABLE 4d-12. RELATIVE VOLUMES OF SOLIDS AT 25°C (*Continued*)

P, kilobars	RbI	CsCl	CsBr	CSI	H_2O	MgO	Al_2O_3	Brass
5	0.954	.....	0.979	0.966				
10	0.917	0.952	0.959	0.937	.....	.....	0.996	
15	0.886	0.932	0.941	0.913	.....	0.990	0.994	
20	0.860	0.914	0.925	0.892	0.737	0.987	0.992	0.984
25	0.838	0.898	0.910	0.873	0.707	0.984	0.990	0.980
30	0.817	0.884	0.896	0.855	0.684	0.981	0.988	0.976
35	0.799	0.870	0.883	0.840	0.664	0.978	0.987	0.973
40	0.783	0.858	0.871	0.826	0.647	0.975	0.985	0.969
45	0.768	0.846	0.859	0.813	0.632	0.973	0.983	0.965
50	0.754	0.836	0.848	0.801	0.618	0.970	0.981	0.962
60	0.730	0.816	0.828	0.779	0.595	0.964	0.977	0.955
70	0.709	0.799	0.810	0.760	.....	0.959	0.974	0.949
80	0.690	0.783	0.794	0.743	.....	0.954	0.970	0.942
90	0.673	0.768	0.778	0.727	.....	0.949	0.967	0.936
100	0.658	0.755	0.764	0.713	.....	0.944	0.964	0.931
120	0.631	0.732	0.739	.....	.....	0.935	0.957	0.919
140	0.609	0.712	0.717	.....	.....	0.927	0.951	0.909
160	0.589	0.694	0.697	.....	.....	0.919	0.945	0.899
180	0.572	0.678	0.680	.....	.....	0.911	0.939	0.890
200	.....	0.664	0.663	.....	.....	0.904	0.933	0.881
220	.....	0.651	0.649	.....	.....	0.897	0.927	0.873
240	.....	.....	0.635	.....	.....	0.890	0.922	0.865
260	.....	.....	0.623	.....	.....	0.884	0.916	0.857
280	.....	.....	0.611	.....	.....	0.878	0.911	0.850
300	.....	.....	0.600	.....	.....	0.872	0.906	0.843
320	.....	.....	0.590	.....	.....	0.867	0.901	0.836
340	.....	.....	0.581	.....	.....	0.861	0.896	0.830
360	.....	.....	0.572	.....	.....	0.856	0.892	0.823
380	.....	.....	0.563	.....	....	0.851	0.887	0.817
400	.....	.....	0.555	.....	.....	0.846	0.883	0.812
420	.....	.....	0.547	.....	.....	0.841	0.878	0.806
440	.....	.....	0.540	.....	.....	0.837	0.874	0.800
460	.....	.....	0.533	.....	.....	0.832	0.870	0.795
480	.....	.....	0.526	.....	.....	0.828	0.866	0.790
500	.....	.....	0.520	.....	.....	0.824	0.862	0.785
550	.....	.....	0.505	.....	.....	0.814	0.852	0.774
600	.....	.....	.....	.....	.....	0.805	0.843	0.763
650	.....	.....	.....	.....	.....	0.796	0.834	0.752
700	.....	.....	.....	.....	.....	0.788	0.825	0.743
750	.....	.....	.....	.....	.....	0.780	0.817	0.734
800	.....	.....	.....	.....	.....	0.772	0.809	0.725
850	.....	.....	.....	.....	.....	0.765	0.802	0.717
900	.....	.....	.....	.....	.....	0.759	0.795	
950	.....	.....	.....	.....	.....	.....	0.788	
1,000	.....	.....	.....	.....	.....	.....	0.781	
1,200	.....	.....	.....	.....	.....	.....	0.757	