

The heat capacity of MgCr2O4, FeCr2O4, and Cr2O3 at low temperatures and derived thermodynamic properties

Klemme_p1686_00_Appendix.txt

Cr2O3		MgCr2O4		FeCr2O4	
T [K]	Cp [J/mol/K]	T [K]	Cp [J/mol/K]	T [K]	Cp [J/mol/K]
1.481	5.836E-4	1.462	1.658E-2	2.350	4.700E-2
1.500	5.635E-4	1.483	1.701E-2	2.365	4.711E-2
1.505	5.602E-4	1.507	1.744E-2	2.379	4.781E-2
1.547	5.913E-4	1.530	1.780E-2	2.392	4.820E-2
1.561	6.023E-4	1.553	1.820E-2	2.406	4.912E-2
1.607	5.987E-4	1.580	1.868E-2	2.420	4.942E-2
1.839	7.167E-4	1.614	1.932E-2	2.435	5.043E-2
1.944	7.898E-4	1.640	1.983E-2	2.451	5.052E-2
2.356	1.064E-3	1.669	2.055E-2	2.465	5.146E-2
2.360	1.080E-3	1.701	2.090E-2	2.479	5.236E-2
2.361	1.071E-3	1.736	2.154E-2	2.492	5.293E-2
2.362	1.070E-3	1.769	2.214E-2	2.507	5.312E-2
2.364	1.024E-3	1.808	2.289E-2	2.520	5.392E-2
2.368	1.082E-3	1.845	2.362E-2	2.533	5.467E-2
2.371	1.059E-3	1.891	2.452E-2	2.547	5.520E-2
2.392	1.080E-3	1.934	2.540E-2	2.560	5.582E-2
2.398	1.126E-3	1.979	2.631E-2	2.574	5.658E-2
2.407	1.215E-3	2.023	2.713E-2	2.592	5.741E-2
2.423	1.143E-3	2.074	2.815E-2	2.634	5.649E-2
2.532	1.208E-3	2.121	2.908E-2	2.647	5.744E-2
2.547	1.165E-3	2.172	3.012E-2	2.663	5.802E-2
2.557	1.238E-3	2.223	3.113E-2	2.677	5.880E-2
2.602	1.261E-3	2.284	3.235E-2	2.691	5.963E-2
2.628	1.346E-3	2.342	3.357E-2	2.707	6.010E-2
2.695	1.377E-3	2.399	3.472E-2	2.727	6.079E-2
2.724	1.405E-3	2.458	3.592E-2	2.739	6.162E-2
2.762	1.400E-3	2.522	3.722E-2	2.750	6.182E-2
2.781	1.482E-3	2.589	3.859E-2	2.759	6.216E-2
2.815	1.505E-3	2.662	4.010E-2	2.768	6.238E-2
2.839	1.485E-3	2.735	4.168E-2	2.779	6.249E-2
2.911	1.602E-3	2.812	4.334E-2	2.789	6.276E-2
2.957	1.621E-3	2.882	4.489E-2	2.797	6.317E-2
2.991	1.667E-3	2.952	4.646E-2	2.806	6.336E-2
3.032	1.718E-3	3.025	4.809E-2	2.817	6.364E-2
3.081	1.763E-3	3.111	5.013E-2	2.827	6.391E-2
3.121	1.813E-3	3.202	5.233E-2	2.836	6.416E-2
3.161	1.863E-3	3.295	5.471E-2	2.844	6.474E-2
3.200	1.888E-3	3.394	5.723E-2	2.854	6.483E-2
3.778	2.638E-3	3.489	5.986E-2	2.862	6.504E-2
3.817	2.674E-3	3.566	6.210E-2	2.870	6.547E-2
3.858	2.746E-3	3.645	6.421E-2	2.880	6.565E-2
4.250	3.294E-3	3.720	6.649E-2	2.888	6.571E-2
4.331	3.394E-3	3.806	6.917E-2	2.897	6.624E-2
4.377	3.426E-3	3.894	7.219E-2	2.904	6.631E-2
4.427	3.543E-3	4.010	7.617E-2	2.911	6.657E-2

4.495	3.575E-3	4.083	7.887E-2	2.921	6.687E-2
4.534	3.717E-3	4.170	8.231E-2	2.929	6.703E-2
4.578	3.808E-3	4.202	8.294E-2	2.936	6.718E-2
4.611	3.835E-3	4.236	8.487E-2	2.944	6.784E-2
4.666	3.959E-3	4.242	8.246E-2	2.952	6.788E-2
4.783	4.306E-3	4.250	8.554E-2	2.959	6.807E-2
4.821	4.306E-3	4.300	8.488E-2	2.967	6.831E-2
4.870	4.372E-3	4.307	8.785E-2	2.974	6.838E-2
4.906	4.547E-3	4.330	8.915E-2	2.982	6.920E-2
4.955	4.615E-3	4.387	8.864E-2	2.990	6.944E-2
5.006	4.763E-3	4.392	9.169E-2	2.997	6.970E-2
5.060	4.863E-3	4.428	9.372E-2	3.004	6.971E-2
5.114	4.993E-3	4.476	9.282E-2	3.011	6.994E-2
5.166	5.126E-3	4.480	9.597E-2	3.019	7.021E-2
5.226	5.300E-3	4.568	9.899E-2	3.025	7.034E-2
5.288	5.444E-3	4.659	1.040E-1	3.033	7.070E-2
5.341	5.612E-3	4.752	1.093E-1	3.039	7.070E-2
5.410	5.848E-3	4.848	1.151E-1	3.047	7.097E-2
5.465	5.950E-3	4.945	1.198E-1	3.054	7.121E-2
5.529	6.125E-3	4.949	1.237E-1	3.062	7.148E-2
5.582	6.267E-3	5.045	1.269E-1	3.067	7.152E-2
5.638	6.462E-3	5.049	1.309E-1	3.074	7.162E-2
5.718	6.691E-3	5.145	1.342E-1	3.081	7.189E-2
5.780	6.887E-3	5.152	1.390E-1	3.087	7.206E-2
5.852	7.144E-3	5.246	1.427E-1	3.094	7.219E-2
5.949	7.469E-3	5.259	1.481E-1	3.099	7.233E-2
5.990	7.713E-3	5.355	1.520E-1	3.107	7.262E-2
6.028	7.746E-3	5.368	1.580E-1	3.112	7.280E-2
6.090	7.985E-3	5.462	1.620E-1	3.119	7.293E-2
6.138	8.160E-3	5.480	1.689E-1	3.126	7.308E-2
6.183	8.264E-3	5.567	1.726E-1	3.132	7.334E-2
6.272	8.762E-3	5.597	1.811E-1	3.140	7.358E-2
6.359	8.872E-3	5.676	1.842E-1	3.144	7.367E-2
6.420	9.137E-3	5.715	1.944E-1	3.151	7.394E-2
6.472	9.380E-3	5.785	1.965E-1	3.156	7.402E-2
6.547	9.798E-3	5.838	2.094E-1	3.163	7.427E-2
6.647	1.008E-2	5.903	2.111E-1	3.170	7.441E-2
6.668	1.017E-2	5.964	2.258E-1	3.175	7.465E-2
6.733	1.044E-2	6.025	2.272E-1	3.180	7.469E-2
6.782	1.064E-2	6.144	2.421E-1	3.187	7.493E-2
6.847	1.099E-2	6.277	2.664E-1	3.192	7.502E-2
6.914	1.135E-2	6.412	2.875E-1	3.199	7.524E-2
6.971	1.150E-2	6.545	3.108E-1	3.205	7.535E-2
7.042	1.182E-2	6.678	3.363E-1	3.213	7.512E-2
7.171	1.236E-2	6.813	3.636E-1	3.225	7.738E-2
7.212	1.272E-2	6.951	3.934E-1	3.244	7.831E-2
7.266	1.285E-2	7.092	4.256E-1	3.261	7.938E-2
7.327	1.307E-2	7.235	4.613E-1	3.282	8.021E-2
7.375	1.348E-2	7.381	4.998E-1	3.305	8.131E-2
7.433	1.369E-2	7.530	5.416E-1	3.329	8.262E-2
7.486	1.414E-2	7.683	5.868E-1	3.358	8.387E-2
7.539	1.442E-2	7.837	6.357E-1	3.382	8.466E-2
7.598	1.473E-2	7.995	6.896E-1	3.536	8.840E-2
7.658	1.510E-2	8.156	7.471E-1	3.570	9.115E-2

7.716	1.541E-2	8.320	8.100E-1	3.602	9.337E-2
7.778	1.577E-2	8.488	8.770E-1	3.629	9.521E-2
7.837	1.618E-2	8.658	9.511E-1	3.766	9.867E-2
7.898	1.654E-2	8.833	1.031E+0	3.801	1.016E-1
8.026	1.737E-2	9.010	1.117E+0	3.937	1.058E-1
8.091	1.777E-2	9.191	1.213E+0	3.978	1.093E-1
8.156	1.825E-2	9.376	1.315E+0	4.143	1.148E-1
8.225	1.866E-2	9.564	1.429E+0	4.188	1.187E-1
8.291	1.917E-2	9.757	1.551E+0	4.215	1.097E-1
8.362	1.968E-2	9.953	1.687E+0	4.231	1.220E-1
8.434	2.022E-2	10.150	1.837E+0	4.260	1.128E-1
8.503	2.069E-2	10.349	2.014E+0	4.325	1.167E-1
8.573	2.128E-2	10.547	2.218E+0	4.389	1.210E-1
8.684	2.209E-2	10.745	2.450E+0	4.455	1.252E-1
8.746	2.254E-2	10.943	2.740E+0	4.517	1.304E-1
8.950	2.426E-2	11.092	3.002E+0	4.589	1.333E-1
9.016	2.476E-2	11.194	3.229E+0	4.660	1.375E-1
9.132	2.550E-2	11.296	3.485E+0	4.733	1.421E-1
9.212	2.635E-2	11.396	3.781E+0	4.802	1.469E-1
9.285	2.706E-2	11.496	4.133E+0	4.872	1.516E-1
9.353	2.773E-2	11.595	4.563E+0	4.941	1.565E-1
9.420	2.829E-2	11.693	5.130E+0	5.007	1.617E-1
9.488	2.884E-2	11.791	5.916E+0	5.080	1.667E-1
9.606	2.981E-2	11.888	7.066E+0	5.164	1.733E-1
9.629	3.025E-2	11.983	8.865E+0	5.255	1.806E-1
9.738	3.121E-2	12.041	9.765E+0	5.349	1.885E-1
9.775	3.165E-2	12.062	1.086E+1	5.442	1.963E-1
9.885	3.262E-2	12.083	1.184E+1	5.528	2.046E-1
9.977	3.368E-2	12.103	1.294E+1	5.629	2.138E-1
10.049	3.439E-2	12.123	1.407E+1	5.727	2.231E-1
10.119	3.512E-2	12.143	1.575E+1	5.816	2.323E-1
10.234	3.621E-2	12.163	1.763E+1	5.913	2.425E-1
10.330	3.733E-2	12.182	1.975E+1	6.004	2.521E-1
10.402	3.809E-2	12.201	2.269E+1	6.101	2.633E-1
10.472	3.881E-2	12.221	2.650E+1	6.206	2.788E-1
10.589	4.024E-2	12.241	3.122E+1	6.299	2.890E-1
10.683	4.126E-2	12.262	3.721E+1	6.390	2.982E-1
10.754	4.202E-2	12.282	4.430E+1	6.492	3.106E-1
10.874	4.355E-2	12.303	5.256E+1	6.588	3.240E-1
10.972	4.461E-2	12.323	6.274E+1	6.700	3.383E-1
11.045	4.555E-2	12.343	7.362E+1	6.800	3.534E-1
11.166	4.697E-2	12.363	8.857E+1	6.932	3.718E-1
11.264	4.834E-2	12.383	1.034E+2	7.038	3.884E-1
11.385	4.990E-2	12.405	1.142E+2	7.177	4.092E-1
11.472	5.087E-2	12.426	1.211E+2	7.291	4.275E-1
11.599	5.263E-2	12.447	1.380E+2	7.442	4.529E-1
11.693	5.369E-2	12.468	1.425E+2	7.562	4.746E-1
11.822	5.561E-2	12.490	1.635E+2	7.719	5.027E-1
11.963	5.762E-2	12.512	1.677E+2	7.842	5.271E-1
12.066	5.900E-2	12.534	1.634E+2	8.007	5.590E-1
12.196	6.096E-2	12.555	1.758E+2	8.139	5.867E-1
12.284	6.206E-2	12.576	1.849E+2	8.310	6.226E-1
12.418	6.413E-2	12.599	1.726E+2	8.448	6.537E-1
12.564	6.641E-2	12.619	1.620E+2	8.602	6.887E-1

12.655	6.761E-2	12.641	1.527E+2	8.799	7.351E-1
12.790	6.981E-2	12.663	1.420E+2	8.962	7.759E-1
12.934	7.199E-2	12.685	1.160E+2	9.133	8.193E-1
13.080	7.451E-2	12.705	1.022E+2	9.319	8.686E-1
13.184	7.595E-2	12.726	8.963E+1	9.442	9.010E-1
13.317	7.836E-2	12.746	7.599E+1	9.670	9.644E-1
13.462	8.084E-2	12.767	6.482E+1	9.794	1.002E+0
13.562	8.243E-2	12.786	6.185E+1	9.993	1.060E+0
13.696	8.496E-2	12.806	5.851E+1	10.195	1.122E+0
13.842	8.773E-2	12.827	5.388E+1	10.395	1.186E+0
13.992	9.032E-2	12.849	4.788E+1	10.610	1.258E+0
14.101	9.241E-2	12.870	4.545E+1	10.831	1.332E+0
14.238	9.511E-2	12.890	4.392E+1	11.056	1.411E+0
14.384	9.798E-2	12.913	3.781E+1	11.277	1.489E+0
14.534	1.010E-1	12.938	2.822E+1	11.509	1.576E+0
14.645	1.030E-1	12.960	1.884E+1	11.758	1.671E+0
14.782	1.056E-1	12.974	1.600E+1	12.002	1.765E+0
14.929	1.090E-1	12.989	1.554E+1	12.256	1.870E+0
15.083	1.123E-1	13.059	1.231E+1	12.511	1.974E+0
15.238	1.157E-1	13.166	9.689E+0	12.759	2.084E+0
15.351	1.176E-1	13.252	8.823E+0	13.017	2.196E+0
15.491	1.212E-1	13.339	8.289E+0	13.285	2.317E+0
15.642	1.249E-1	13.434	7.834E+0	13.548	2.439E+0
15.798	1.282E-1	13.532	7.477E+0	13.803	2.562E+0
15.916	1.306E-1	13.629	7.227E+0	14.070	2.692E+0
16.054	1.345E-1	13.728	6.991E+0	14.338	2.827E+0
16.204	1.378E-1	13.826	6.824E+0	14.595	2.964E+0
16.690	1.501E-1	13.925	6.690E+0	14.868	3.108E+0
16.816	1.534E-1	14.075	6.529E+0	15.140	3.252E+0
16.956	1.574E-1	14.276	6.341E+0	15.402	3.400E+0
17.110	1.617E-1	14.476	6.197E+0	15.672	3.555E+0
17.270	1.662E-1	14.674	6.132E+0	15.946	3.712E+0
17.411	1.706E-1	14.874	6.039E+0	16.217	3.876E+0
17.566	1.743E-1	15.075	5.972E+0	16.487	4.039E+0
17.728	1.796E-1	15.273	5.922E+0	16.760	4.207E+0
17.892	1.838E-1	15.472	5.876E+0	17.035	4.381E+0
18.044	1.886E-1	15.674	5.851E+0	17.312	4.568E+0
18.204	1.939E-1	15.876	5.792E+0	17.588	4.747E+0
18.339	1.972E-1	16.077	5.761E+0	17.863	4.934E+0
18.483	2.021E-1	16.285	5.745E+0	18.139	5.125E+0
18.645	2.087E-1	16.486	5.693E+0	18.410	5.318E+0
18.825	2.132E-1	16.679	5.698E+0	18.688	5.517E+0
18.986	2.191E-1	16.880	5.669E+0	18.744	5.463E+0
19.125	2.231E-1	17.079	5.662E+0	18.972	5.728E+0
19.273	2.284E-1	17.281	5.656E+0	19.253	5.818E+0
19.431	2.343E-1	17.481	5.644E+0	19.254	5.938E+0
19.596	2.400E-1	17.681	5.624E+0	19.535	6.148E+0
19.768	2.466E-1	17.881	5.632E+0	19.788	6.221E+0
19.922	2.515E-1	18.082	5.623E+0	19.811	6.364E+0
20.073	2.573E-1	18.281	5.599E+0	20.089	6.596E+0
20.235	2.640E-1	18.481	5.607E+0	20.317	6.634E+0
21.061	2.961E-1	18.679	5.606E+0	20.381	6.822E+0
21.221	3.032E-1	18.877	5.620E+0	20.670	7.057E+0
21.388	3.104E-1	19.076	5.617E+0	20.882	7.079E+0

21.562	3.185E-1	19.278	5.619E+0	20.949	7.300E+0
21.721	3.243E-1	19.477	5.622E+0	21.230	7.533E+0
21.879	3.324E-1	19.674	5.641E+0	21.453	7.570E+0
22.048	3.402E-1	19.873	5.649E+0	21.512	7.780E+0
22.223	3.483E-1	20.071	5.653E+0	21.793	8.031E+0
22.405	3.569E-1	20.268	5.655E+0	22.041	8.103E+0
22.578	3.640E-1	20.466	5.660E+0	22.076	8.294E+0
22.742	3.726E-1	20.664	5.675E+0	22.371	8.555E+0
22.915	3.818E-1	20.860	5.691E+0	22.656	8.681E+0
23.096	3.901E-1	21.059	5.720E+0	23.288	9.292E+0
23.269	3.981E-1	21.257	5.725E+0	23.933	9.922E+0
23.434	4.076E-1	21.456	5.738E+0	24.602	1.066E+1
23.608	4.167E-1	21.653	5.745E+0	25.285	1.144E+1
23.794	4.264E-1	21.850	5.779E+0	25.991	1.227E+1
23.974	4.350E-1	22.050	5.797E+0	26.718	1.320E+1
24.142	4.449E-1	22.248	5.811E+0	27.463	1.419E+1
24.320	4.555E-1	22.447	5.825E+0	28.230	1.528E+1
25.050	4.974E-1	22.645	5.840E+0	29.018	1.651E+1
25.243	5.088E-1	22.841	5.876E+0	29.828	1.786E+1
25.434	5.210E-1	23.039	5.884E+0	30.654	1.938E+1
25.615	5.313E-1	23.236	5.904E+0	31.505	2.116E+1
25.791	5.415E-1	23.433	5.926E+0	32.372	2.327E+1
25.963	5.544E-1	23.629	5.948E+0	33.253	2.585E+1
26.145	5.660E-1	23.825	5.986E+0	34.150	2.918E+1
26.339	5.785E-1	24.025	5.999E+0	35.060	3.357E+1
26.533	5.909E-1	24.222	6.022E+0	35.975	3.815E+1
26.719	6.030E-1	24.419	6.041E+0	37.014	3.407E+1
26.912	6.168E-1	24.616	6.076E+0	38.396	1.973E+1
27.108	6.293E-1	24.813	6.096E+0	39.745	1.915E+1
27.296	6.407E-1	25.012	6.123E+0	40.773	1.979E+1
27.490	6.575E-1	25.764	6.152E+0	41.769	2.046E+1
27.686	6.701E-1	26.512	6.265E+0	42.756	2.116E+1
27.876	6.856E-1	27.289	6.391E+0	43.746	2.189E+1
28.066	6.984E-1	28.086	6.524E+0	44.733	2.264E+1
28.249	7.158E-1	28.900	6.665E+0	45.719	2.341E+1
28.444	7.289E-1	29.739	6.813E+0	46.705	2.419E+1
28.651	7.457E-1	30.600	6.975E+0	47.701	2.499E+1
28.860	7.617E-1	31.486	7.144E+0	48.698	2.582E+1
29.056	7.770E-1	32.398	7.321E+0	49.696	2.665E+1
29.241	7.936E-1	33.337	7.518E+0	50.695	2.749E+1
29.435	8.100E-1	34.301	7.720E+0	51.695	2.836E+1
30.222	8.794E-1	35.293	7.937E+0	52.693	2.922E+1
30.424	8.982E-1	36.297	8.163E+0	53.692	3.008E+1
30.635	9.162E-1	37.303	8.395E+0	54.692	3.097E+1
30.836	9.349E-1	38.316	8.632E+0	55.690	3.185E+1
31.030	9.540E-1	39.332	8.883E+0	56.690	3.272E+1
31.230	9.744E-1	40.334	9.136E+0	57.689	3.359E+1
31.438	9.943E-1	41.335	9.393E+0	58.691	3.448E+1
31.645	1.016E+0	42.334	9.660E+0	59.693	3.535E+1
31.856	1.034E+0	43.334	9.935E+0	60.691	3.620E+1
32.455	1.095E+0	44.329	1.021E+1	61.691	3.704E+1
32.667	1.117E+0	45.327	1.049E+1	62.695	3.785E+1
33.199	1.165E+0	46.341	1.079E+1	63.699	3.864E+1
33.841	1.238E+0	47.358	1.110E+1	64.705	3.938E+1

34.498	1.317E+0	48.372	1.141E+1	65.710	4.007E+1
35.170	1.399E+0	49.381	1.172E+1	66.715	4.070E+1
35.852	1.486E+0	50.390	1.204E+1	67.727	4.129E+1
36.551	1.580E+0	51.396	1.237E+1	68.729	4.182E+1
37.262	1.679E+0	52.403	1.271E+1	69.741	4.228E+1
37.986	1.784E+0	53.412	1.305E+1	70.750	4.273E+1
38.727	1.897E+0	54.423	1.340E+1	71.753	4.314E+1
39.482	2.015E+0	55.437	1.376E+1	72.757	4.355E+1
40.178	2.131E+0	56.458	1.413E+1	73.756	4.391E+1
40.971	2.264E+0	57.469	1.450E+1	74.766	4.431E+1
41.742	2.400E+0	58.482	1.487E+1	75.769	4.473E+1
42.530	2.544E+0	59.489	1.525E+1	76.774	4.510E+1
43.315	2.694E+0	60.494	1.565E+1	77.776	4.551E+1
44.099	2.848E+0	61.497	1.604E+1	78.787	4.595E+1
44.892	3.008E+0	62.504	1.644E+1	79.802	4.639E+1
45.683	3.174E+0	63.515	1.685E+1	80.819	4.685E+1
46.476	3.344E+0	64.527	1.726E+1	81.830	4.735E+1
47.270	3.523E+0	65.531	1.768E+1	82.840	4.787E+1
48.064	3.705E+0	66.535	1.810E+1	83.848	4.841E+1
48.861	3.892E+0	67.544	1.853E+1	84.857	4.893E+1
49.656	4.086E+0	68.550	1.897E+1	85.865	4.949E+1
50.451	4.284E+0	69.553	1.941E+1	86.871	5.008E+1
51.251	4.487E+0	70.565	1.986E+1	87.879	5.067E+1
52.048	4.698E+0	71.566	2.030E+1	88.885	5.119E+1
52.847	4.911E+0	72.585	2.077E+1	89.895	5.192E+1
53.648	5.132E+0	73.592	2.124E+1	90.899	5.252E+1
54.450	5.358E+0	74.604	2.172E+1	91.902	5.314E+1
55.251	5.586E+0	75.616	2.219E+1	92.911	5.383E+1
56.052	5.824E+0	76.621	2.266E+1	93.916	5.436E+1
56.856	6.065E+0	77.624	2.315E+1	94.919	5.512E+1
57.658	6.308E+0	78.628	2.363E+1	95.916	5.580E+1
58.455	6.557E+0	79.634	2.412E+1	96.917	5.648E+1
59.254	6.811E+0	80.640	2.461E+1	97.916	5.711E+1
60.058	7.072E+0	81.647	2.513E+1	98.921	5.784E+1
60.871	7.344E+0	82.651	2.564E+1	99.924	5.854E+1
61.696	7.619E+0	83.661	2.614E+1	100.927	5.922E+1
62.532	7.905E+0	84.675	2.668E+1	101.928	5.986E+1
63.376	8.196E+0	85.682	2.718E+1	102.931	6.059E+1
64.235	8.500E+0	86.688	2.771E+1	103.931	6.132E+1
65.101	8.813E+0	87.692	2.824E+1	104.930	6.202E+1
65.980	9.130E+0	88.698	2.873E+1	105.930	6.274E+1
66.873	9.463E+0	89.706	2.930E+1	106.929	6.345E+1
67.778	9.803E+0	90.709	2.984E+1	107.929	6.416E+1
68.695	1.015E+1	91.715	3.040E+1	108.934	6.491E+1
69.626	1.052E+1	92.717	3.095E+1	109.938	6.559E+1
70.567	1.088E+1	93.728	3.149E+1	110.941	6.627E+1
71.524	1.127E+1	94.735	3.205E+1	111.942	6.701E+1
72.484	1.166E+1	95.738	3.260E+1	112.942	6.762E+1
73.459	1.206E+1	96.749	3.317E+1	113.942	6.834E+1
74.445	1.247E+1	97.759	3.375E+1	114.944	6.897E+1
75.434	1.289E+1	98.761	3.430E+1	115.944	6.956E+1
76.425	1.331E+1	99.761	3.487E+1	116.945	7.010E+1
77.419	1.374E+1	100.761	3.544E+1	117.945	7.065E+1
78.412	1.417E+1	101.762	3.602E+1	118.944	7.105E+1

79.405	1.460E+1	102.760	3.659E+1	119.945	7.143E+1
80.399	1.504E+1	103.762	3.716E+1	120.944	7.170E+1
81.393	1.550E+1	104.761	3.776E+1	121.949	7.176E+1
82.390	1.595E+1	105.760	3.833E+1	122.950	7.169E+1
83.384	1.641E+1	106.754	3.891E+1	123.950	7.154E+1
84.380	1.687E+1	107.754	3.949E+1	124.957	7.120E+1
85.378	1.734E+1	108.753	4.008E+1	125.958	7.088E+1
86.372	1.782E+1	109.748	4.066E+1	126.962	7.052E+1
87.358	1.828E+1	110.748	4.127E+1	127.966	7.025E+1
88.350	1.873E+1	111.742	4.189E+1	128.969	7.013E+1
89.352	1.924E+1	112.741	4.246E+1	129.973	7.024E+1
90.351	1.973E+1	113.741	4.306E+1	130.967	7.055E+1
91.350	2.023E+1	114.739	4.365E+1	131.965	7.086E+1
92.346	2.071E+1	115.735	4.427E+1	132.960	7.128E+1
93.342	2.120E+1	116.731	4.484E+1	133.956	7.167E+1
94.338	2.171E+1	117.727	4.546E+1	134.949	7.214E+1
95.332	2.220E+1	118.722	4.605E+1	135.942	7.272E+1
96.331	2.271E+1	119.718	4.668E+1	136.943	7.314E+1
97.333	2.323E+1	120.713	4.728E+1	137.935	7.361E+1
98.331	2.375E+1	121.709	4.790E+1	138.933	7.420E+1
99.327	2.425E+1	122.705	4.848E+1	139.927	7.464E+1
100.324	2.476E+1	123.700	4.909E+1	140.922	7.524E+1
101.322	2.527E+1	124.694	4.968E+1	141.916	7.570E+1
102.317	2.580E+1	125.691	5.030E+1	142.911	7.623E+1
103.313	2.633E+1	126.680	5.091E+1	143.901	7.672E+1
104.309	2.686E+1	127.673	5.151E+1	144.895	7.721E+1
105.302	2.736E+1	128.670	5.210E+1	145.887	7.775E+1
106.298	2.790E+1	129.665	5.272E+1	146.875	7.827E+1
107.291	2.843E+1	130.658	5.332E+1	147.857	7.886E+1
108.286	2.897E+1	131.651	5.394E+1	148.847	7.934E+1
109.281	2.949E+1	132.642	5.454E+1	149.835	7.989E+1
110.278	3.003E+1	133.634	5.509E+1	150.826	8.030E+1
111.272	3.056E+1	134.627	5.574E+1	151.815	8.084E+1
112.263	3.108E+1	135.616	5.634E+1	152.806	8.144E+1
113.257	3.165E+1	136.611	5.698E+1	153.803	8.187E+1
114.251	3.216E+1	137.601	5.756E+1	154.791	8.244E+1
115.244	3.271E+1	138.591	5.816E+1	155.781	8.294E+1
116.238	3.326E+1	139.580	5.880E+1	156.775	8.337E+1
117.233	3.381E+1	140.570	5.935E+1	157.767	8.396E+1
118.226	3.436E+1	141.558	5.994E+1	158.756	8.449E+1
119.218	3.492E+1	142.549	6.053E+1	159.749	8.499E+1
120.212	3.546E+1	143.537	6.117E+1	160.743	8.545E+1
121.205	3.599E+1	144.525	6.174E+1	161.733	8.593E+1
122.198	3.651E+1	145.516	6.236E+1	162.724	8.645E+1
123.189	3.708E+1	146.502	6.295E+1	163.709	8.694E+1
124.183	3.762E+1	147.492	6.354E+1	164.700	8.742E+1
125.177	3.818E+1	148.483	6.416E+1	165.689	8.798E+1
126.169	3.873E+1	149.469	6.475E+1	166.677	8.851E+1
127.163	3.927E+1	150.462	6.534E+1	167.655	8.910E+1
128.153	3.981E+1	151.447	6.596E+1	168.647	8.950E+1
129.145	4.036E+1	152.436	6.647E+1	169.636	8.999E+1
130.136	4.094E+1	153.425	6.705E+1	170.618	9.049E+1
131.129	4.149E+1	154.410	6.765E+1	171.602	9.100E+1
132.122	4.201E+1	155.401	6.825E+1	172.590	9.148E+1

133.114	4.259E+1	156.386	6.885E+1	173.579	9.195E+1
134.105	4.315E+1	157.373	6.942E+1	174.571	9.238E+1
135.096	4.370E+1	158.360	6.996E+1	175.556	9.294E+1
136.083	4.423E+1	159.346	7.056E+1	176.548	9.341E+1
137.063	4.481E+1	160.333	7.116E+1	177.542	9.391E+1
138.050	4.532E+1	161.317	7.167E+1	178.533	9.449E+1
139.032	4.589E+1	162.303	7.226E+1	179.527	9.485E+1
140.017	4.639E+1	163.285	7.286E+1	180.517	9.531E+1
141.002	4.694E+1	164.270	7.342E+1	181.508	9.574E+1
141.987	4.747E+1	165.253	7.398E+1	182.498	9.619E+1
142.973	4.803E+1	166.235	7.452E+1	183.484	9.685E+1
143.956	4.857E+1	167.218	7.508E+1	184.474	9.716E+1
144.938	4.912E+1	168.203	7.566E+1	185.463	9.771E+1
145.924	4.969E+1	169.184	7.623E+1	186.451	9.811E+1
146.910	5.021E+1	170.166	7.670E+1	187.438	9.852E+1
147.894	5.076E+1	171.148	7.733E+1	188.427	9.900E+1
148.883	5.129E+1	172.128	7.785E+1	189.412	9.943E+1
149.868	5.183E+1	173.114	7.831E+1	190.403	9.998E+1
150.765	5.230E+1	174.093	7.890E+1	191.385	1.003E+2
151.762	5.283E+1	175.075	7.948E+1	192.362	1.008E+2
152.748	5.337E+1	176.053	7.998E+1	193.343	1.012E+2
153.735	5.394E+1	177.036	8.055E+1	194.329	1.018E+2
154.721	5.445E+1	178.016	8.108E+1	195.318	1.022E+2
155.709	5.499E+1	178.995	8.163E+1	196.402	1.026E+2
156.694	5.554E+1	179.976	8.218E+1	197.380	1.031E+2
157.680	5.604E+1	180.953	8.267E+1	198.353	1.037E+2
158.665	5.659E+1	181.932	8.320E+1	199.329	1.040E+2
159.652	5.713E+1	182.912	8.370E+1	200.304	1.046E+2
160.638	5.760E+1	183.889	8.422E+1	201.279	1.050E+2
161.623	5.821E+1	184.869	8.469E+1	202.252	1.053E+2
162.610	5.871E+1	185.845	8.529E+1	203.228	1.056E+2
163.595	5.921E+1	186.822	8.580E+1	204.214	1.062E+2
164.579	5.977E+1	187.800	8.625E+1	205.192	1.066E+2
165.564	6.028E+1	188.776	8.680E+1	206.171	1.071E+2
166.551	6.081E+1	189.754	8.729E+1	207.160	1.074E+2
167.538	6.131E+1	190.733	8.782E+1	208.143	1.079E+2
168.526	6.186E+1	191.212	8.780E+1	209.121	1.083E+2
169.517	6.237E+1	192.181	8.821E+1	210.096	1.087E+2
170.504	6.291E+1	193.165	8.876E+1	210.751	1.091E+2
171.491	6.338E+1	194.134	8.924E+1	211.071	1.091E+2
172.477	6.396E+1	195.104	8.978E+1	212.286	1.095E+2
173.463	6.446E+1	196.073	9.025E+1	213.811	1.103E+2
174.450	6.491E+1	197.052	9.068E+1	214.757	1.107E+2
175.437	6.549E+1	198.026	9.119E+1	215.752	1.108E+2
176.422	6.601E+1	199.004	9.154E+1	216.738	1.114E+2
177.407	6.648E+1	199.980	9.217E+1	217.725	1.118E+2
178.394	6.702E+1	200.956	9.271E+1	218.709	1.120E+2
179.383	6.753E+1	201.930	9.314E+1	219.691	1.124E+2
180.373	6.805E+1	202.906	9.358E+1	220.677	1.131E+2
181.362	6.850E+1	203.884	9.411E+1	221.664	1.133E+2
182.355	6.897E+1	204.860	9.452E+1	222.649	1.135E+2
183.345	6.955E+1	205.835	9.508E+1	223.637	1.141E+2
184.332	7.006E+1	206.811	9.554E+1	224.622	1.144E+2
185.321	7.050E+1	207.796	9.592E+1	225.609	1.148E+2

186.313	7.104E+1	208.778	9.642E+1	226.598	1.153E+2
187.356	7.129E+1	209.765	9.681E+1	227.581	1.156E+2
188.396	7.199E+1	210.751	9.727E+1	228.566	1.161E+2
189.375	7.263E+1	211.735	9.773E+1	229.548	1.166E+2
190.346	7.312E+1	212.720	9.814E+1	230.531	1.166E+2
191.320	7.359E+1	213.705	9.865E+1	231.516	1.173E+2
192.305	7.400E+1	214.687	9.895E+1	232.497	1.176E+2
193.286	7.452E+1	215.672	9.955E+1	233.482	1.180E+2
194.273	7.502E+1	216.653	1.000E+2	234.462	1.185E+2
195.255	7.557E+1	217.638	1.005E+2	235.441	1.186E+2
196.240	7.599E+1	218.621	1.009E+2	236.424	1.192E+2
197.222	7.659E+1	219.602	1.014E+2	237.408	1.195E+2
198.203	7.698E+1	220.583	1.018E+2	238.389	1.197E+2
199.187	7.753E+1	221.564	1.023E+2	239.370	1.202E+2
200.167	7.797E+1	222.545	1.026E+2	240.353	1.203E+2
201.143	7.847E+1	223.528	1.030E+2	241.334	1.210E+2
202.123	7.892E+1	224.514	1.036E+2	242.315	1.214E+2
203.100	7.942E+1	225.494	1.040E+2	243.294	1.214E+2
204.082	7.992E+1	226.484	1.045E+2	244.274	1.216E+2
205.065	8.034E+1	227.470	1.048E+2	245.252	1.224E+2
206.046	8.089E+1	228.461	1.051E+2	246.230	1.226E+2
207.027	8.126E+1	229.443	1.056E+2	247.212	1.230E+2
208.007	8.182E+1	230.424	1.061E+2	248.193	1.232E+2
208.987	8.229E+1	231.401	1.066E+2	249.171	1.237E+2
209.963	8.276E+1	232.380	1.068E+2	250.149	1.235E+2
210.943	8.326E+1	233.359	1.073E+2	251.130	1.242E+2
211.921	8.370E+1	234.336	1.076E+2	252.112	1.247E+2
212.902	8.427E+1	235.318	1.080E+2	253.094	1.250E+2
213.881	8.478E+1	236.296	1.085E+2	254.076	1.249E+2
214.854	8.518E+1	237.275	1.090E+2	255.055	1.255E+2
215.829	8.566E+1	238.255	1.092E+2	256.034	1.259E+2
216.803	8.601E+1	239.237	1.098E+2	257.014	1.263E+2
217.777	8.646E+1	240.214	1.101E+2	257.996	1.264E+2
218.748	8.700E+1	241.196	1.106E+2	258.972	1.269E+2
219.721	8.743E+1	242.172	1.108E+2	259.953	1.273E+2
220.692	8.785E+1	243.150	1.111E+2	260.931	1.276E+2
221.666	8.811E+1	244.124	1.115E+2	261.910	1.276E+2
222.637	8.881E+1	245.101	1.120E+2	262.893	1.282E+2
223.608	8.912E+1	246.076	1.124E+2	263.877	1.282E+2
224.583	8.953E+1	247.051	1.127E+2	264.856	1.285E+2
225.559	9.000E+1	248.029	1.131E+2	265.835	1.288E+2
226.533	9.049E+1	249.000	1.135E+2	266.810	1.295E+2
227.508	9.089E+1	249.976	1.138E+2	267.788	1.295E+2
228.484	9.118E+1	250.954	1.143E+2	268.766	1.300E+2
229.458	9.149E+1	251.931	1.145E+2	269.743	1.303E+2
230.431	9.204E+1	252.911	1.149E+2	270.721	1.306E+2
231.404	9.243E+1	253.884	1.153E+2	271.697	1.312E+2
232.380	9.289E+1	254.861	1.156E+2	272.683	1.313E+2
233.354	9.325E+1	255.836	1.160E+2	273.662	1.314E+2
234.327	9.369E+1	256.813	1.164E+2	274.641	1.316E+2
235.298	9.399E+1	257.791	1.168E+2	275.621	1.319E+2
236.279	9.442E+1	258.765	1.170E+2	276.599	1.327E+2
237.258	9.482E+1	259.740	1.174E+2	277.617	1.330E+2
238.237	9.516E+1	260.716	1.178E+2	278.595	1.325E+2

239.214	9.552E+1	261.686	1.182E+2	279.576	1.328E+2
240.195	9.596E+1	262.662	1.185E+2	280.556	1.336E+2
241.172	9.615E+1	263.629	1.188E+2	281.536	1.337E+2
242.148	9.666E+1	264.604	1.191E+2	282.515	1.340E+2
243.126	9.692E+1	265.577	1.196E+2	283.494	1.340E+2
244.100	9.753E+1	266.549	1.199E+2	284.480	1.346E+2
245.072	9.791E+1	267.521	1.201E+2	285.460	1.348E+2
246.045	9.840E+1	268.492	1.205E+2	286.439	1.344E+2
247.022	9.869E+1	269.465	1.208E+2	287.420	1.351E+2
247.996	9.914E+1	270.434	1.211E+2	288.400	1.354E+2
248.967	9.962E+1	271.409	1.214E+2	289.382	1.352E+2
249.944	9.994E+1	272.384	1.217E+2	290.361	1.358E+2
250.921	1.004E+2	273.355	1.220E+2	291.342	1.362E+2
251.898	1.008E+2	274.323	1.223E+2	292.322	1.366E+2
252.876	1.013E+2	275.294	1.226E+2	293.304	1.371E+2
253.853	1.015E+2	276.265	1.231E+2	294.286	1.372E+2
254.831	1.021E+2	277.239	1.232E+2	295.267	1.378E+2
255.811	1.026E+2	278.210	1.235E+2	296.246	1.380E+2
256.787	1.029E+2	279.182	1.239E+2	297.233	1.382E+2
257.768	1.035E+2	280.155	1.241E+2	298.214	1.385E+2
258.745	1.038E+2	281.124	1.244E+2	299.196	1.385E+2
259.723	1.043E+2	282.096	1.248E+2	300.177	1.389E+2
260.700	1.047E+2	283.067	1.250E+2	300.287	1.390E+2
261.678	1.050E+2	284.037	1.252E+2	301.162	1.388E+2
262.657	1.054E+2	285.008	1.257E+2	301.267	1.395E+2
263.633	1.061E+2	285.977	1.258E+2	302.148	1.392E+2
264.616	1.065E+2	286.948	1.261E+2	302.218	1.398E+2
265.594	1.069E+2	287.918	1.263E+2	303.130	1.396E+2
266.571	1.075E+2	288.889	1.266E+2	303.171	1.397E+2
267.547	1.080E+2	289.859	1.269E+2	304.115	1.395E+2
268.522	1.082E+2	290.830	1.270E+2	304.134	1.401E+2
269.501	1.087E+2	291.805	1.272E+2	305.100	1.399E+2
270.478	1.094E+2	292.774	1.276E+2	305.101	1.404E+2
271.452	1.097E+2	293.746	1.279E+2	306.070	1.403E+2
272.430	1.102E+2	294.716	1.282E+2	306.104	1.407E+2
273.406	1.109E+2	295.689	1.284E+2	307.045	1.409E+2
274.379	1.112E+2	296.663	1.288E+2	308.027	1.407E+2
275.354	1.118E+2	297.636	1.289E+2	309.009	1.412E+2
276.328	1.122E+2	298.605	1.291E+2	309.992	1.411E+2
277.303	1.126E+2	299.578	1.292E+2	310.975	1.417E+2
278.278	1.132E+2	300.551	1.295E+2	311.957	1.420E+2
279.250	1.137E+2	301.529	1.297E+2	312.937	1.429E+2
280.224	1.141E+2	302.524	1.298E+2	313.917	1.435E+2
281.195	1.148E+2	303.504	1.302E+2	314.902	1.434E+2
282.169	1.151E+2	304.608	1.302E+2	315.885	1.440E+2
283.133	1.160E+2	305.466	1.306E+2	316.871	1.439E+2
284.106	1.164E+2	306.434	1.307E+2	317.856	1.440E+2
285.075	1.171E+2	307.403	1.308E+2	318.837	1.445E+2
286.045	1.172E+2	308.369	1.312E+2	319.818	1.452E+2
287.016	1.179E+2	309.340	1.314E+2	320.799	1.460E+2
287.988	1.184E+2	310.310	1.316E+2	321.781	1.467E+2
288.957	1.191E+2	311.283	1.319E+2	322.766	1.470E+2
289.926	1.198E+2	312.252	1.321E+2	323.749	1.473E+2
290.894	1.206E+2	313.221	1.323E+2	324.732	1.480E+2

291.866	1.211E+2	314.196	1.326E+2	325.711	1.491E+2
292.837	1.218E+2	315.166	1.327E+2	326.692	1.498E+2
293.808	1.227E+2	316.142	1.330E+2	327.673	1.506E+2
294.778	1.236E+2	317.114	1.334E+2	328.653	1.514E+2
295.747	1.241E+2	318.085	1.334E+2	329.635	1.527E+2
296.719	1.250E+2	319.059	1.336E+2	330.618	1.527E+2
297.688	1.261E+2	320.031	1.338E+2	331.602	1.536E+2
298.655	1.268E+2	321.000	1.340E+2	332.588	1.540E+2
299.624	1.278E+2	321.973	1.343E+2	333.567	1.554E+2
300.590	1.286E+2	322.949	1.344E+2	334.554	1.558E+2
301.159	1.295E+2	323.920	1.346E+2	335.545	1.568E+2
301.558	1.299E+2	324.896	1.349E+2	336.527	1.573E+2
302.409	1.312E+2	325.870	1.351E+2	337.505	1.575E+2
302.523	1.313E+2	326.852	1.354E+2		
302.724	1.312E+2	327.828	1.356E+2		
303.349	1.320E+2	328.803	1.357E+2		
303.489	1.328E+2	329.780	1.361E+2		
303.665	1.325E+2	330.753	1.363E+2		
304.313	1.339E+2	331.728	1.367E+2		
304.450	1.349E+2	332.706	1.367E+2		
304.957	1.354E+2	333.679	1.369E+2		
305.280	1.367E+2	334.654	1.372E+2		
305.413	1.371E+2	335.621	1.373E+2		
305.601	1.366E+2	336.598	1.376E+2		
305.926	1.358E+2	337.572	1.378E+2		
306.253	1.338E+2	338.542	1.380E+2		
306.392	1.318E+2	339.517	1.382E+2		
306.563	1.302E+2				
306.860	1.271E+2				
307.159	1.242E+2				
307.412	1.233E+2				
307.456	1.234E+2				
307.746	1.218E+2				
308.042	1.206E+2				
308.333	1.203E+2				
308.423	1.203E+2				
308.623	1.200E+2				
308.917	1.197E+2				
309.210	1.190E+2				
309.407	1.190E+2				
310.087	1.183E+2				
310.390	1.177E+2				
310.395	1.175E+2				
311.372	1.168E+2				
312.349	1.158E+2				
313.324	1.154E+2				
314.302	1.147E+2				
315.272	1.146E+2				
316.247	1.141E+2				
317.225	1.136E+2				
318.195	1.136E+2				
319.168	1.132E+2				
320.143	1.131E+2				
321.117	1.127E+2				

322.095	1.124E+2
323.063	1.124E+2
324.035	1.121E+2
325.011	1.120E+2
325.987	1.119E+2
326.960	1.120E+2
327.936	1.117E+2
328.912	1.120E+2
329.889	1.119E+2
330.860	1.118E+2
331.834	1.120E+2
332.816	1.115E+2
333.790	1.117E+2
334.764	1.117E+2
335.742	1.112E+2
336.714	1.114E+2
337.690	1.112E+2
338.664	1.115E+2
339.638	1.117E+2