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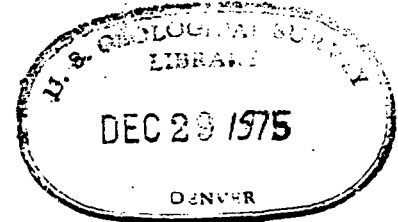
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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

THE VOLUMETRIC PROPERTIES OF AQUEOUS SODIUM CHLORIDE SOLUTIONS
FROM 0° TO 500°C AT PRESSURES UP TO 2000 BARS BASED ON A
REGRESSION OF THE AVAILABLE LITERATURE DATA

by

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Open-file report
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This report is preliminary
and has not been edited or
reviewed for conformity with
Geological Survey standards

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Pressure (P) - volume (V) - temperature (T) data for brines are required to establish optimum operating temperatures, pressures, and flow rates for the production of geothermal brine fields; to minimize scaling and corrosion; and to intelligently design turbines for production of electricity. Chemical modeling of geothermal brine systems requires thermodynamic data derived from volumetric properties of brines, e.g. partial molal volumes. As of the present time, the majority of the available experimental P-V-T data is for aqueous sodium chloride solutions (Potter, 1975).

Prior to this, the only reliable compilation of volumetric data for aqueous, vapor-saturated sodium chloride solutions was that of Haas (1970). There are no compilations available for solutions at pressures greater than the saturation vapor pressure and for temperatures greater than 325°C (Potter, 1975). The purpose of the following tables is to supply a compilation of an internally consistent set of density values for aqueous sodium chloride solutions from 0° to 500°C at pressures up to 2000 bars based on currently available experimental data as summarized by Potter, Shaw and Haas (1975).

The density data presented in Tables 1-27 were obtained from a computer regression of the P-V-T data from the 120 references cited by Potter et al. (1975). The computer regression of the data was accomplished by using a least squares method in which the individual data points were weighted with respect to the relative uncertainty. The uncertainties used in the majority of cases were those assigned by the experimentalist; however, in those cases where uncertainties were not stated, an estimate

was supplied on the basis of the experimental method employed in the study. Data sets which were discordant with the majority of the available data were rejected and not used in the regression.

The data summarized in Tables 1 and 2 are for vapor-saturated solutions from 0° to 500°C. These were obtained by regressing the experimental densities at constant temperature as a function of composition and then regressing the resulting smoothed densities at constant composition as a function of temperature. Tables 3 through 27 contain density data for a constant composition as a function of pressure and temperature. The tabulated densities were obtained by first regressing the volumetric data at constant temperature and pressure. These results were then regressed at constant pressure and composition as a function of temperature.

Table 1. Densities of vapor saturated NaCl solutions, g/cm³

Temp °C	Molality															
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5*	8.0*
0	1.02190	1.04244	1.06206	1.08086	1.09891	1.11625	1.13292	1.14895	1.16437	1.17920	1.19347	1.20719	--	--	--	--
25	1.01710	1.03621	1.05458	1.07227	1.08932	1.10576	1.12162	1.13691	1.15167	1.16591	1.17964	1.19288	--	--	--	--
50	1.0074	1.0259	1.0437	1.0609	1.0775	1.0936	1.1092	1.1242	1.1389	1.1530	1.1667	1.1801	--	--	--	--
75	0.9941	1.0126	1.0304	1.0477	1.0645	1.0807	1.0963	1.1115	1.1263	1.1405	1.1543	1.1677	--	--	--	--
100	0.978	0.997	1.014	1.031	1.046	1.062	1.078	1.093	1.107	1.122	1.136	1.151	1.165	--	--	--
125	0.961	0.980	0.998	1.013	1.028	1.044	1.060	1.075	1.089	1.104	1.118	1.133	1.147	--	--	--
150	0.941	0.960	0.979	0.993	1.008	1.024	1.040	1.055	1.070	1.084	1.099	1.114	1.128	1.143	--	--
175	0.916	0.937	0.957	0.971	0.985	1.003	1.018	1.034	1.049	1.064	1.079	1.094	1.108	1.123	1.14	--
200	0.888	0.910	0.932	0.947	0.961	0.979	0.996	1.011	1.027	1.042	1.057	1.072	1.088	1.103	1.12	1.14
225	0.856	0.880	0.903	0.920	0.934	0.955	0.971	0.987	1.004	1.019	1.035	1.050	1.066	1.081	1.10	1.12
250	0.820	0.846	0.872	0.890	0.905	0.928	0.945	0.962	0.980	0.996	1.012	1.027	1.043	1.058	1.08	1.10
275	0.780	0.810	0.838	0.859	0.874	0.899	0.918	0.936	0.954	0.971	0.987	1.003	1.019	1.034	1.05	1.08
300	0.736	0.769	0.801	0.824	0.842	0.869	0.889	0.908	0.927	0.945	0.962	0.978	0.994	1.009	1.03	1.05
325	0.689	0.726	0.760	0.788	0.807	0.837	0.859	0.880	0.899	0.917	0.935	0.952	0.968	0.984	1.00	1.02
350	0.637	0.679	0.717	0.749	0.770	0.804	0.827	0.849	0.870	0.889	0.907	0.925	0.941	0.957	0.97	0.99
375	0.56	0.629	0.671	0.708	0.730	0.768	0.794	0.818	0.839	0.860	0.878	0.896	0.913	0.929	0.94	0.95
400	--	0.56	0.621	0.665	0.689	0.731	0.760	0.785	0.808	0.829	0.849	0.867	0.884	0.900	0.90	0.91
425	--	--	0.569	0.619	0.646	0.693	0.724	0.751	0.775	0.797	0.818	0.837	0.854	0.869	0.87	0.87
450*	--	--	--	0.57	0.60	0.65	0.67	0.72	0.74	0.76	0.79	0.81	0.82	0.84	0.83	0.82
475*	--	--	--	--	--	0.61	0.65	0.68	0.71	0.73	0.75	0.77	0.79	0.81	0.79	0.77
500*	--	--	--	--	--	--	0.61	0.64	0.67	0.70	0.72	0.74	0.76	0.77	0.75	0.72

Extrapolated values

Uncertainties: 5-place figures $\pm 10^{-5}$
50° data $\pm 10^{-4}$
75° data $\pm 5 \times 10^{-4}$
3-place figures $\pm .005$
2-place figures $\pm .05$

Table 2. Densities of vapor saturated NaCl solutions, g/cm³.

Temp °C	wt. %													
	1	3	5	7	9	11	13	15	17	19	21	23	25	30*
0	1.00755	1.02283	1.03814	1.05354	1.06908	1.08476	1.10060	1.11660	1.13276	1.14906	1.16551	1.18210	1.19880	--
25	1.00411	1.01823	1.03247	1.04688	1.06146	1.07624	1.09122	1.10639	1.12176	1.13732	1.15307	1.16900	1.18509	--
50	0.9948	1.0085	1.0222	1.0362	1.0503	1.0647	1.0793	1.0942	1.1093	1.1247	1.1403	1.1561	1.1722	--
75	0.9816	0.9952	1.0090	1.0229	1.0372	1.0516	1.0663	1.0813	1.0965	1.1119	1.1277	1.1436	1.1598	--
100	0.963	0.979	0.993	1.007	1.021	1.035	1.049	1.063	1.078	1.093	1.109	1.125	1.142	--
125	0.947	0.962	0.976	0.990	1.003	1.017	1.031	1.045	1.060	1.075	1.091	1.107	1.124	--
150	0.926	0.942	0.956	0.970	0.984	0.997	1.011	1.025	1.040	1.055	1.071	1.088	1.105	--
175	0.901	0.917	0.932	0.947	0.961	0.975	0.989	1.003	1.018	1.034	1.050	1.067	1.085	1.14
200	0.871	0.889	0.905	0.921	0.936	0.950	0.965	0.980	0.995	1.011	1.028	1.046	1.064	1.12
225	0.836	0.857	0.875	0.892	0.908	0.923	0.939	0.955	0.971	0.988	1.005	1.023	1.041	1.10
250	0.797	0.822	0.842	0.860	0.878	0.894	0.912	0.928	0.945	0.963	0.981	0.999	1.018	1.07
275	0.753	0.782	0.805	0.825	0.845	0.863	0.882	0.900	0.918	0.937	0.955	0.974	0.994	1.05
300	0.705	0.739	0.765	0.787	0.809	0.830	0.850	0.870	0.890	0.909	0.928	0.948	0.968	1.02
325	0.652	0.692	0.721	0.745	0.771	0.794	0.817	0.838	0.859	0.880	0.901	0.921	0.942	1.00
350	0.594	0.641	0.675	0.701	0.730	0.756	0.781	0.805	0.828	0.850	0.872	0.893	0.914	0.97
375	0.532	0.586	0.624	0.654	0.686	0.716	0.744	0.770	0.795	0.819	0.841	0.864	0.886	0.93
400	--	--	0.571	0.603	0.640	0.674	0.704	0.733	0.760	0.786	0.810	0.833	0.856	0.90
425	--	--	--	0.550	0.591	0.630	0.663	0.694	0.724	0.752	0.778	0.802	0.825	0.87
450*	--	--	--	--	0.54	0.58	0.62	0.65	0.69	0.72	0.74	0.77	0.79	0.83
475*	--	--	--	--	--	--	--	0.61	0.65	0.68	0.71	0.74	0.76	0.79
500*	--	--	--	--	--	--	--	--	0.61	0.64	0.67	0.70	0.73	0.75

* Extrapolated values

Uncertainties: 5-place figures $\pm 10^{-5}$
50° data $\pm 10^{-4}$
75° data $\pm 5 \times 10^{-4}$
3-place figures ± 0.005
2-place figures ± 0.05

Table 3. Densities of 0.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.018	1.022	1.027	1.031	1.035	1.039	1.043	1.048	1.051	1.055	1.064	1.072	1.080	1.088
50	1.012	1.015	1.020	1.026	1.030	1.034	1.039	1.042	1.046	1.050	1.058	1.067	1.075	1.083
75	1.002	1.005	1.009	1.017	1.021	1.026	1.032	1.034	1.038	1.042	1.051	1.059	1.069	1.077
100	0.989	0.991	0.996	1.005	1.010	1.015	1.021	1.024	1.028	1.032	1.041	1.050	1.060	1.069
125	0.971	0.975	0.980	0.990	0.995	1.000	1.008	1.011	1.015	1.020	1.029	1.039	1.050	1.059
150	0.950	0.955	0.960	0.971	0.977	0.983	0.992	0.995	1.000	1.005	1.015	1.026	1.038	1.048
175	0.925	0.931	0.938	0.950	0.956	0.963	0.972	0.976	0.982	0.988	0.999	1.011	1.024	1.035
200	0.897	0.905	0.913	0.925	0.933	0.940	0.950	0.955	0.961	0.968	0.981	0.994	1.009	1.020
225	0.865	0.875	0.884	0.897	0.906	0.914	0.924	0.931	0.938	0.946	0.961	0.975	0.992	1.004
250	0.829	0.842	0.853	0.866	0.876	0.885	0.896	0.904	0.913	0.921	0.939	0.955	0.972	0.986
275	0.789	0.806	0.818	0.831	0.843	0.854	0.864	0.875	0.885	0.894	0.915	0.932	0.951	0.967
300	0.746	0.767	0.780	0.793	0.806	0.819	0.830	0.843	0.854	0.865	0.888	0.908	0.929	0.946
325	--	0.724	0.740	0.752	0.767	0.781	0.792	0.808	0.821	0.833	0.860	0.882	0.904	0.923
350	--	0.68*	0.70*	0.71*	0.725	0.741	0.752	0.771	0.785	0.798	0.829	0.854	0.878	0.899
375	--	0.63*	0.65*	0.66*	0.68*	0.70*	0.71*	0.731	0.747	0.762	0.797	0.824	0.850	0.873
400	--	--	--	--	0.63*	0.65*	0.66*	0.69*	0.71*	0.722	0.762	0.792	0.820	0.846
425	--	--	--	--	--	--	--	0.64*	0.66*	0.68*	0.725	0.758	0.788	0.816
450	--	--	--	--	--	--	--	--	--	0.64*	0.69*	0.723	0.755	0.786
475	--	--	--	--	--	--	--	--	--	--	0.64*	0.685	0.719	0.753
500	--	--	--	--	--	--	--	--	--	--	--	0.65*	0.68*	0.719

*Extrapolated values

Uncertainties: 3-place figures ± 0.005
 2-place figures ± 0.05

Table 4. Densities of 1 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.038	1.042	1.046	1.052	1.055	1.059	1.064	1.067	1.071	1.075	1.083	1.092	1.100	1.107
50	1.031	1.035	1.038	1.045	1.050	1.054	1.057	1.060	1.065	1.068	1.077	1.086	1.094	1.102
75	1.020	1.024	1.028	1.036	1.042	1.046	1.048	1.051	1.057	1.060	1.069	1.078	1.087	1.095
100	1.006	1.010	1.015	1.024	1.030	1.035	1.037	1.039	1.046	1.049	1.060	1.069	1.078	1.087
125	0.989	0.993	0.999	1.009	1.016	1.021	1.023	1.026	1.033	1.036	1.048	1.057	1.068	1.077
150	0.968	0.974	0.980	0.991	0.999	1.005	1.006	1.010	1.018	1.022	1.034	1.044	1.056	1.066
175	0.945	0.951	0.958	0.970	0.979	0.985	0.987	0.993	1.000	1.005	1.019	1.030	1.043	1.053
200	0.918	0.926	0.934	0.946	0.956	0.963	0.966	0.973	0.980	0.986	1.001	1.013	1.027	1.039
225	0.888	0.898	0.907	0.919	0.930	0.938	0.942	0.951	0.958	0.964	0.982	0.995	1.011	1.023
250	0.856	0.866	0.877	0.889	0.900	0.910	0.916	0.927	0.934	0.941	0.960	0.976	0.992	1.006
275	0.819	0.832	0.845	0.856	0.868	0.880	0.882	0.901	0.908	0.916	0.937	0.954	0.972	0.987
300	0.780	0.795	0.809	0.821	0.833	0.846	0.856	0.873	0.879	0.888	0.912	0.931	0.951	0.967
325	--	0.755	0.771	0.782	0.795	0.810	0.822	0.843	0.848	0.859	0.885	0.906	0.928	0.946
350	--	0.71*	0.730	0.741	0.754	0.771	0.785	0.810	0.815	0.827	0.856	0.879	0.903	0.923
375	--	0.67*	0.69*	0.70*	0.710	0.729	0.747	0.776	0.779	0.793	0.826	0.851	0.877	0.898
400	--	--	0.64*	0.65*	0.663	0.685	0.705	0.740	0.741	0.758	0.793	0.821	0.849	0.873
425	--	--	--	--	0.613	0.638	0.662	0.701	0.701	0.720	0.758	0.789	0.819	0.845
450	--	--	--	--	0.56*	0.59*	0.615	0.660	0.659	0.680	0.722	0.756	0.788	0.816
475	--	--	--	--	0.50*	0.53*	0.57*	0.62*	0.614	0.637	0.68*	0.721	0.755	0.786
500	--	--	--	--	0.44*	0.48*	0.52*	0.57*	0.57*	0.593	0.64*	0.684	0.72*	0.754

*Extrapolated values

Uncertainties: 3-place figures ±.005,
2-place figures ±.05

Table 5. Densities of 1.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.058	1.062	1.065	1.071	1.074	1.078	1.082	1.085	1.089	1.093	1.101	1.109	1.117	1.124
50	1.049	1.053	1.057	1.064	1.068	1.072	1.076	1.079	1.083	1.086	1.094	1.103	1.110	1.118
75	1.038	1.042	1.046	1.054	1.059	1.063	1.067	1.071	1.074	1.078	1.086	1.095	1.102	1.110
100	1.024	1.028	1.032	1.042	1.047	1.052	1.056	1.060	1.064	1.067	1.076	1.085	1.093	1.101
125	1.007	1.011	1.017	1.027	1.033	1.038	1.043	1.047	1.051	1.055	1.064	1.074	1.082	1.091
150	0.987	0.992	0.998	1.010	1.016	1.022	1.027	1.032	1.036	1.040	1.050	1.062	1.070	1.080
175	0.964	0.971	0.977	0.989	0.996	1.003	1.009	1.014	1.019	1.024	1.035	1.047	1.057	1.067
200	0.938	0.946	0.954	0.967	0.974	0.982	0.988	0.995	1.000	1.006	1.018	1.032	1.042	1.053
225	0.910	0.919	0.928	0.941	0.950	0.958	0.966	0.973	0.979	0.986	1.000	1.015	1.026	1.038
250	0.878	0.890	0.899	0.913	0.922	0.932	0.941	0.949	0.956	0.963	0.979	0.996	1.009	1.022
275	0.844	0.857	0.868	0.882	0.893	0.903	0.913	0.922	0.931	0.939	0.957	0.976	0.990	1.004
300	0.807	0.822	0.835	0.848	0.860	0.872	0.883	0.894	0.903	0.913	0.934	0.954	0.970	0.986
325	0.77	0.785	0.799	0.812	0.826	0.838	0.851	0.863	0.874	0.885	0.909	0.931	0.949	0.966
350	--	0.745	0.760	0.773	0.788	0.802	0.817	0.830	0.842	0.845	0.882	0.906	0.926	0.944
375	--	0.70*	0.72*	0.731	0.748	0.764	0.780	0.794	0.809	0.822	0.853	0.880	0.902	0.922
400	--	0.66*	0.68*	0.69*	0.71*	0.72*	0.741	0.757	0.773	0.788	0.823	0.852	0.877	0.898
425	--	--	--	0.64*	0.66*	0.68*	0.70*	0.72*	0.735	0.752	0.791	0.822	0.850	0.874
450	--	--	--	--	--	--	0.66*	0.68*	0.70*	0.73*	0.758	0.791	0.822	0.847
475	--	--	--	--	--	--	--	--	0.65*	0.67*	0.72*	0.759	0.793	0.820
500	--	--	--	--	--	--	--	--	--	--	0.68*	0.725	0.762	0.792

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 6. Densities of 2 molar NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.075	1.079	1.081	1.088	1.091	1.095	1.098	1.102	1.106	1.109	1.118	1.125	1.133	1.140
50	1.065	1.071	1.072	1.081	1.086	1.089	1.902	1.096	1.099	1.103	1.111	1.119	1.126	1.134
75	1.053	1.059	1.061	1.071	1.078	1.081	1.085	1.088	1.091	1.094	1.102	1.111	1.119	1.126
100	1.038	1.045	1.048	1.059	1.067	1.071	1.075	1.077	1.080	1.084	1.092	1.101	1.109	1.117
125	1.020	1.028	1.032	1.044	1.054	1.058	1.063	1.065	1.068	1.071	1.081	1.091	1.099	1.107
150	1.000	1.007	1.014	1.027	1.038	1.042	1.048	1.050	1.053	1.057	1.068	1.078	1.088	1.096
175	0.976	0.984	0.994	1.007	1.019	1.024	1.032	1.034	1.037	1.042	1.053	1.065	1.075	1.084
200	0.950	0.958	0.972	0.985	0.998	1.004	1.013	1.015	1.019	1.024	1.036	1.050	1.061	1.071
225	0.921	0.929	0.947	0.961	0.974	0.981	0.992	0.994	0.999	1.004	1.019	1.033	1.045	1.056
250	0.889	0.897	0.920	0.934	0.947	0.955	0.968	0.970	0.976	0.983	0.999	1.015	1.028	1.040
275	0.854	0.862	0.891	0.905	0.917	0.927	0.943	0.945	0.952	0.960	0.978	0.996	1.010	1.023
300	0.82*	0.83*	0.859	0.873	0.885	0.897	0.915	0.917	0.926	0.935	0.955	0.975	0.991	1.005
325	--	--	0.825	0.839	0.850	0.863	0.885	0.888	0.898	0.908	0.931	0.953	0.971	0.986
350	--	--	0.790	0.802	0.812	0.828	0.853	0.856	0.868	0.879	0.905	0.929	0.949	0.966
375	--	--	0.71*	0.763	0.772	0.790	0.818	0.822	0.836	0.849	0.878	0.904	0.926	0.944
400	--	--	--	0.72*	0.728	0.749	0.782	0.786	0.802	0.816	0.849	0.877	0.901	0.922
425	--	--	--	0.68*	0.683	0.706	0.743	0.747	0.766	0.782	0.819	0.849	0.876	0.898
450	--	--	--	--	0.634	0.660	0.701	0.707	0.728	0.746	0.787	0.820	0.849	0.873
475	--	--	--	--	0.58*	0.61*	0.658	0.664	0.688	0.71*	0.753	0.789	0.821	0.847
500	--	--	--	--	0.53*	0.56*	0.61*	0.62*	0.646	0.67*	0.72*	0.757	0.791	0.820

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 7. Densities of 2.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.092	1.096	1.099	1.104	1.108	1.111	1.114	1.118	1.122	1.125	1.133	1.141	1.149	1.156
50	1.084	1.087	1.090	1.097	1.101	1.104	1.109	1.112	1.115	1.118	1.126	1.134	1.142	1.149
75	1.072	1.075	1.078	1.087	1.091	1.095	1.101	1.103	1.107	1.110	1.118	1.126	1.133	1.141
100	1.057	1.061	1.064	1.075	1.079	1.084	1.091	1.093	1.096	1.100	1.108	1.117	1.124	1.132
125	1.040	1.044	1.048	1.060	1.066	1.071	1.078	1.080	1.084	1.088	1.096	1.106	1.114	1.122
150	1.019	1.024	1.031	1.043	1.049	1.055	1.064	1.066	1.070	1.074	1.083	1.094	1.102	1.111
175	0.995	1.001	1.011	1.024	1.031	1.037	1.048	1.049	1.054	1.058	1.069	1.080	1.089	1.099
200	0.968	0.976	0.989	1.003	1.010	1.017	1.029	1.031	1.036	1.041	1.053	1.066	1.075	1.086
225	0.938	0.948	0.965	0.979	0.988	0.995	1.008	1.010	1.016	1.022	1.035	1.049	1.060	1.072
250	0.906	0.918	0.939	0.953	0.963	0.971	0.985	0.988	0.994	1.001	1.016	1.032	1.044	1.057
275	0.87	0.884	0.911	0.925	0.935	0.945	0.960	0.963	0.971	0.979	0.996	1.013	1.026	1.040
300	0.84	0.848	0.881	0.894	0.906	0.916	0.933	0.937	0.946	0.954	0.974	0.993	1.008	1.023
325	--	0.81	0.849	0.862	0.874	0.886	0.903	0.908	0.918	0.928	0.951	0.971	0.988	1.004
350	--	0.77	0.814	0.826	0.840	0.853	0.872	0.878	0.889	0.900	0.926	0.948	0.967	0.984
375	--	--	0.78	0.789	0.804	0.818	0.838	0.846	0.858	0.871	0.900	0.924	0.945	0.963
400	--	--	0.74*	0.75*	0.765	0.781	0.802	0.811	0.826	0.840	0.872	0.898	0.922	0.942
425	--	--	--	0.71*	0.73*	0.74*	0.764	0.775	0.791	0.807	0.843	0.871	0.897	0.919
450	--	--	--	--	0.68*	0.70*	0.72*	0.74*	0.75*	0.772	0.812	0.843	0.872	0.894
475	--	--	--	--	--	--	0.68*	0.70*	0.72*	0.74*	0.780	0.813	0.845	0.868
500	--	--	--	--	--	--	--	--	--	0.70*	0.75*	0.782	0.817	0.843

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 8. Densities of 3 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.108	1.112	1.115	1.120	1.123	1.126	1.130	1.133	1.136	1.140	1.148	1.156	1.163	1.170
50	1.098	1.102	1.105	1.112	1.118	1.121	1.124	1.128	1.131	1.134	1.142	1.149	1.157	1.164
75	1.086	1.091	1.093	1.102	1.110	1.113	1.116	1.122	1.124	1.127	1.133	1.141	1.149	1.157
100	1.071	1.076	1.079	1.090	1.099	1.103	1.106	1.113	1.115	1.117	1.123	1.132	1.140	1.148
125	1.054	1.059	1.064	1.076	1.087	1.090	1.094	1.102	1.104	1.106	1.112	1.122	1.130	1.139
150	1.034	1.040	1.046	1.059	1.071	1.075	1.079	1.088	1.090	1.093	1.099	1.110	1.119	1.128
175	1.012	1.018	1.027	1.040	1.054	1.058	1.063	1.072	1.075	1.078	1.085	1.097	1.106	1.116
200	0.987	0.994	1.006	1.019	1.033	1.039	1.044	1.054	1.057	1.061	1.069	1.082	1.092	1.104
225	0.960	0.967	0.982	0.996	1.011	1.017	1.023	1.034	1.038	1.042	1.052	1.066	1.078	1.090
250	0.930	0.938	0.957	0.971	0.985	0.993	1.000	1.011	1.016	1.021	1.033	1.049	1.062	1.075
275	0.898	0.906	0.931	0.944	0.958	0.967	0.975	0.986	0.992	0.998	1.013	1.031	1.045	1.059
300	0.864	0.872	0.902	0.914	0.927	0.938	0.948	0.959	0.969	0.974	0.991	1.011	1.026	1.041
325	--	0.837	0.871	0.882	0.895	0.907	0.919	0.930	0.940	0.948	0.968	0.990	1.007	1.023
350	--	--	0.839	0.848	0.860	0.874	0.887	0.898	0.909	0.921	0.943	0.967	0.986	1.004
375	--	--	0.804	0.812	0.822	0.838	0.853	0.864	0.875	0.892	0.917	0.943	0.964	0.983
400	--	--	0.768	0.773	0.782	0.800	0.817	0.828	0.839	0.861	0.889	0.918	0.941	0.961
425	--	--	0.73*	0.74*	0.74*	0.760	0.779	0.789	0.800	0.829	0.860	0.892	0.917	0.939
450	--	--	0.69*	0.70*	0.70*	0.718	0.739	0.749	0.759	0.795	0.825	0.864	0.892	0.915
475	--	--	--	--	--	0.673	0.697	0.705	0.716	0.76*	0.797	0.825	0.865	0.890
500	--	--	--	--	--	0.63*	0.65*	0.66*	0.670	0.72*	0.764	0.804	0.838	0.864

*Extrapolated values

Uncertainties: 3-place figures ±0.005
 2-place figures ±.05

Table 9. Densities of 3.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.126	1.028	1.130	1.134	1.139	1.142	1.045	1.149	1.152	1.155	1.165	1.171	1.178	1.185
50	1.113	1.117	1.120	1.127	1.133	1.136	1.139	1.143	1.146	1.149	1.157	1.164	1.172	1.178
75	1.100	1.106	1.108	1.117	1.125	1.128	1.131	1.137	1.139	1.142	1.148	1.156	1.163	1.171
100	1.083	1.091	1.094	1.105	1.114	1.118	1.121	1.128	1.130	1.132	1.138	1.147	1.154	1.162
125	1.066	1.074	1.079	1.091	1.102	1.105	1.108	1.117	1.119	1.121	1.127	1.137	1.144	1.153
150	1.047	1.055	1.061	1.074	1.086	1.090	1.094	1.103	1.105	1.108	1.114	1.125	1.133	1.142
175	1.026	1.034	1.043	1.055	1.068	1.073	1.078	1.087	1.090	1.093	1.100	1.112	1.121	1.131
200	1.002	1.011	1.022	1.035	1.049	1.054	1.059	1.069	1.072	1.076	1.084	1.097	1.107	1.119
225	0.977	0.984	0.998	1.012	1.027	1.033	1.039	1.050	1.054	1.058	1.068	1.081	1.093	1.105
250	0.950	0.956	0.974	0.988	1.002	1.010	1.017	1.028	1.032	1.037	1.049	1.065	1.078	1.090
275	0.921	0.926	0.949	0.962	0.975	0.984	0.992	1.003	1.009	1.015	1.030	1.047	1.061	1.075
300	0.886	0.893	0.921	0.933	0.946	0.956	0.966	0.977	0.986	0.991	1.008	1.028	1.042	1.057
325	0.85*	0.860	0.892	0.903	0.915	0.927	0.938	0.949	0.958	0.966	0.986	1.007	1.024	1.040
350	--	0.82*	0.861	0.870	0.882	0.895	0.907	0.918	0.928	0.940	0.961	0.985	1.004	1.021
375	--	0.78*	0.821	0.834	0.844	0.860	0.874	0.885	0.896	0.912	0.936	0.962	1.982	1.001
400	--	--	0.79*	0.796	0.805	0.823	0.840	0.851	0.862	0.882	0.909	0.937	0.960	0.979
425	--	--	--	0.76*	0.77*	0.791	0.811	0.821	0.832	0.852	0.881	0.912	0.937	0.958
450	--	--	--	--	--	0.739	0.759	0.770	0.780	0.815	0.845	0.885	0.912	0.935
475	--	--	--	--	--	0.708	0.734	0.746	0.757	0.787	0.817	0.857	0.887	0.911
500	--	--	--	--	--	0.67*	0.69*	0.72*	0.74*	0.75*	0.789	0.829	0.863	0.888

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 10. Densities of 4 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.140	1.142	1.145	1.150	1.153	1.157	1.159	1.163	1.166	1.169	1.177	1.184	1.192	1.198
50	1.128	1.131	1.135	1.141	1.145	1.149	1.153	1.156	1.160	1.163	1.170	1.178	1.185	1.193
75	1.115	1.119	1.123	1.131	1.136	1.140	1.145	1.148	1.151	1.154	1.162	1.171	1.178	1.187
100	1.099	1.105	1.109	1.119	1.124	1.129	1.135	1.137	1.141	1.144	1.153	1.162	1.169	1.180
125	1.083	1.089	1.094	1.105	1.110	1.116	1.123	1.125	1.129	1.133	1.142	1.152	1.159	1.171
150	1.064	1.071	1.077	1.089	1.095	1.101	1.109	1.111	1.115	1.120	1.130	1.140	1.148	1.161
175	1.044	1.052	1.058	1.071	1.078	1.084	1.093	1.095	1.100	1.105	1.116	1.127	1.136	1.150
200	1.022	1.031	1.037	1.051	1.058	1.066	1.075	1.077	1.083	1.089	1.101	1.113	1.123	1.137
225	0.999	1.008	1.015	1.029	1.037	1.045	1.055	1.058	1.065	1.071	1.084	1.098	1.109	1.124
250	0.974	0.984	0.992	1.005	1.014	1.023	1.033	1.037	1.044	1.051	1.066	1.081	1.093	1.109
275	0.947	0.958	0.966	0.980	0.989	0.998	1.009	1.014	1.022	1.030	1.047	1.063	1.077	1.093
300	0.919	0.930	0.939	0.952	0.962	0.972	0.983	0.989	0.999	1.007	1.026	1.044	1.059	1.075
325	0.889	0.901	0.910	0.923	0.933	0.944	0.955	0.962	0.973	0.982	1.004	1.023	1.040	1.057
350	--	0.870	0.880	0.892	0.902	0.914	0.925	0.934	0.946	0.956	0.981	1.001	1.021	1.037
375	--	0.837	0.848	0.858	0.870	0.882	0.893	0.903	0.917	0.929	0.956	0.978	1.000	1.016
400	--	0.803	0.814	0.823	0.835	0.848	0.859	0.871	0.887	0.899	0.929	0.953	0.978	0.995
425	--	0.77*	0.78*	0.786	0.798	0.812	0.823	0.838	0.855	0.869	0.902	0.928	0.954	0.975
450	--	0.73*	0.74*	0.75*	0.76*	0.77*	0.785	0.802	0.821	0.836	0.872	0.900	0.930	0.952
475	--	--	--	0.71*	0.72*	0.73*	0.745	0.765	0.785	0.802	0.842	0.872	0.905	0.930
500	--	--	--	--	--	--	0.703	0.725	0.748	0.766	0.810	0.842	0.878	0.909

*Extrapolated values

Uncertainties: 3-place figures ±0.005
 2-place figures ±0.05

Table 11. Densities of 4.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.155	1.158	1.161	1.165	1.168	1.171	1.174	1.177	1.181	1.184	1.191	1.198	1.205	1.212
50	1.142	1.146	1.149	1.155	1.159	1.163	1.167	1.170	1.173	1.177	1.184	1.192	1.199	1.206
75	1.128	1.133	1.136	1.145	1.149	1.153	1.157	1.161	1.165	1.168	1.176	1.184	1.191	1.199
100	1.113	1.118	1.122	1.132	1.137	1.142	1.146	1.151	1.154	1.158	1.166	1.175	1.183	1.191
125	1.096	1.102	1.107	1.118	1.123	1.129	1.133	1.138	1.142	1.146	1.155	1.165	1.173	1.182
150	1.078	1.084	1.090	1.102	1.108	1.114	1.119	1.125	1.129	1.133	1.143	1.154	1.162	1.172
175	1.058	1.065	1.071	1.084	1.091	1.097	1.103	1.109	1.114	1.118	1.129	1.141	1.150	1.161
200	1.037	1.045	1.051	1.064	1.072	1.079	1.085	1.092	1.097	1.102	1.114	1.127	1.137	1.148
225	1.014	1.023	1.030	1.043	1.051	1.059	1.066	1.073	1.079	1.084	1.098	1.112	1.123	1.135
250	0.990	1.000	1.007	1.020	1.029	1.037	1.045	1.052	1.059	1.065	1.080	1.095	1.108	1.121
275	0.965	0.975	0.983	0.996	1.005	1.013	1.022	1.030	1.037	1.045	1.062	1.078	1.092	1.106
300	0.938	0.949	0.957	0.970	0.979	0.988	0.997	1.007	1.014	1.022	1.041	1.059	1.074	1.090
325	0.904	0.922	0.930	0.942	0.951	0.961	0.971	0.981	0.989	0.999	1.020	1.038	1.056	1.072
350	--	0.893	0.902	0.912	0.922	0.933	0.943	0.954	0.963	0.973	0.997	1.017	1.036	1.054
375	--	0.863	0.872	0.880	0.891	0.902	0.914	0.925	0.936	0.946	0.972	0.994	1.015	1.034
400	--	0.831	0.841	0.847	0.858	0.870	0.883	0.895	0.906	0.918	0.947	0.970	0.993	1.014
425	--	0.80*	0.81*	0.81*	0.82*	0.836	0.850	0.863	0.875	0.888	0.920	0.945	0.970	0.993
450	--	0.76*	0.77*	0.78*	0.79*	0.80*	0.82*	0.83*	0.843	0.857	0.892	0.919	0.946	0.970
475	--	--	--	--	--	0.76*	0.78*	0.79*	0.81*	0.82*	0.862	0.891	0.921	0.947
500	--	--	--	--	--	--	--	--	0.77*	0.79*	0.831	0.862	0.895	0.922

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 12. Densities of 5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.168	1.172	1.175	1.179	1.182	1.185	1.188	1.191	1.194	1.198	1.205	1.212	1.219	1.225
50	1.153	1.160	1.163	1.170	1.173	1.177	1.180	1.184	1.187	1.190	1.198	1.205	1.212	1.219
75	1.137	1.147	1.151	1.158	1.163	1.167	1.171	1.175	1.178	1.181	1.189	1.197	1.204	1.212
100	1.119	1.132	1.136	1.146	1.151	1.156	1.160	1.164	1.167	1.171	1.180	1.188	1.195	1.203
125	1.101	1.116	1.121	1.132	1.137	1.142	1.147	1.152	1.155	1.159	1.169	1.178	1.185	1.194
150	1.083	1.099	1.104	1.116	1.122	1.128	1.133	1.138	1.142	1.146	1.157	1.166	1.175	1.184
175	1.063	1.080	1.086	1.098	1.105	1.111	1.117	1.123	1.127	1.132	1.143	1.154	1.163	1.173
200	1.042	1.060	1.066	1.079	1.086	1.093	1.099	1.106	1.110	1.116	1.128	1.140	1.150	1.161
225	1.021	1.038	1.045	1.058	1.066	1.073	1.080	1.087	1.092	1.098	1.112	1.125	1.136	1.148
250	0.998	1.016	1.023	1.036	1.044	1.052	1.059	1.067	1.073	1.079	1.095	1.109	1.121	1.134
275	0.975	0.991	0.999	1.011	1.020	1.029	1.037	1.045	1.052	1.059	1.076	1.091	1.105	1.119
300	0.950	0.966	0.974	0.986	0.995	1.004	1.013	1.022	1.029	1.037	1.056	1.073	1.088	1.103
325	0.922	0.939	0.947	0.958	0.968	0.978	0.987	0.997	1.005	1.014	1.035	1.053	1.070	1.086
350	--	0.910	0.919	0.929	0.939	0.950	0.960	0.970	0.979	0.989	1.012	1.032	1.051	1.068
375	--	0.881	0.890	0.899	0.909	0.920	0.931	0.942	0.952	0.963	0.989	1.010	1.031	1.049
400	--	0.850	0.860	0.867	0.877	0.889	0.901	0.912	0.924	0.936	0.964	0.987	1.010	1.030
425	--	0.82*	0.83*	0.83*	0.844	0.856	0.869	0.880	0.894	0.907	0.937	0.963	0.988	1.009
450	--	0.78*	0.80*	0.80*	0.81*	0.82*	0.84*	0.847	0.862	0.876	0.909	0.937	0.965	0.987
475	--	--	--	--	0.77*	0.79*	0.80*	0.812	0.829	0.845	0.880	0.910	0.940	0.965
500	--	--	--	--	--	--	--	0.78*	0.80*	0.811	0.850	0.883	0.915	0.941

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 13. Densities of 5.5 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.183	1.186	1.189	1.193	1.196	1.199	1.202	1.205	1.209	1.211	1.218	1.225	1.232	1.238
50	1.171	1.174	1.177	1.183	1.187	1.191	1.194	1.197	1.201	1.204	1.211	1.128	1.225	1.232
75	1.157	1.161	1.164	1.172	1.176	1.180	1.184	1.188	1.192	1.195	1.202	1.210	1.217	1.224
100	1.142	1.146	1.150	1.159	1.164	1.169	1.173	1.177	1.181	1.184	1.193	1.200	1.208	1.215
125	1.125	1.130	1.135	1.145	1.150	1.156	1.160	1.165	1.169	1.173	1.182	1.190	1.198	1.206
150	1.107	1.113	1.118	1.129	1.135	1.141	1.146	1.151	1.156	1.160	1.169	1.178	1.187	1.196
175	1.088	1.094	1.100	1.112	1.118	1.124	1.130	1.135	1.141	1.145	1.156	1.166	1.175	1.185
200	1.068	1.074	1.080	1.093	1.100	1.107	1.112	1.119	1.124	1.129	1.141	1.152	1.162	1.172
225	1.046	1.053	1.059	1.072	1.080	1.087	1.094	1.100	1.106	1.112	1.125	1.137	1.148	1.160
250	1.024	1.030	1.037	1.050	1.058	1.066	1.073	1.080	1.087	1.093	1.108	1.121	1.133	1.146
275	0.999	1.007	1.014	1.027	1.035	1.043	1.051	1.059	1.066	1.073	1.090	1.104	1.118	1.131
300	0.974	0.982	0.989	1.001	1.010	1.019	1.028	1.036	1.044	1.052	1.070	1.086	1.101	1.116
325	0.947	0.955	0.963	0.975	0.984	0.993	1.002	1.012	1.021	1.029	1.049	1.067	1.083	1.099
350	0.919	0.928	0.936	0.946	0.956	0.966	0.976	0.986	0.995	1.005	1.027	1.046	1.065	1.082
375	0.89*	0.899	0.908	0.916	0.926	0.937	0.948	0.959	0.969	0.979	1.004	1.025	1.045	1.064
400	0.85*	0.868	0.878	0.885	0.895	0.907	0.918	0.930	0.941	0.952	0.979	1.002	1.025	1.044
425	--	0.84*	0.846	0.852	0.863	0.875	0.887	0.899	0.912	0.924	0.954	0.979	1.003	1.024
450	--	0.80*	0.81*	0.82*	0.83*	0.84*	0.854	0.868	0.881	0.894	0.927	0.954	0.981	1.004
475	--	--	0.78*	0.78*	0.79*	0.81*	0.82*	0.83*	0.85*	0.863	0.898	0.928	0.958	0.982
500	--	--	--	--	--	--	0.78*	0.80*	0.82*	0.83*	0.869	0.902	0.934	0.959

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 14. Densities of 6 molal NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.198	1.201	1.203	1.207	1.210	1.213	1.216	1.219	1.222	1.225	1.232	1.239	1.245	1.251
50	1.184	1.188	1.191	1.196	1.200	1.203	1.207	1.211	1.214	1.217	1.224	1.231	1.238	1.244
75	1.170	1.174	1.178	1.184	1.189	1.192	1.196	1.201	1.204	1.207	1.215	1.222	1.229	1.236
100	1.154	1.159	1.163	1.171	1.176	1.180	1.184	1.190	1.193	1.197	1.205	1.213	1.220	1.228
125	1.138	1.142	1.147	1.156	1.161	1.166	1.171	1.177	1.181	1.185	1.193	1.202	1.210	1.218
150	1.120	1.125	1.130	1.140	1.146	1.151	1.157	1.163	1.167	1.171	1.181	1.191	1.199	1.208
175	1.101	1.107	1.112	1.123	1.129	1.135	1.141	1.148	1.152	1.157	1.167	1.178	1.187	1.197
200	1.081	1.087	1.093	1.104	1.111	1.117	1.123	1.131	1.136	1.141	1.153	1.164	1.174	1.185
225	1.060	1.067	1.073	1.084	1.091	1.098	1.105	1.113	1.118	1.124	1.137	1.149	1.161	1.172
250	1.038	1.045	1.052	1.063	1.071	1.078	1.085	1.094	1.099	1.106	1.120	1.134	1.146	1.158
275	1.015	1.022	1.029	1.040	1.048	1.056	1.064	1.073	1.079	1.086	1.102	1.117	1.130	1.143
300	0.991	0.998	1.006	1.016	1.025	1.033	1.041	1.050	1.057	1.065	1.083	1.099	1.114	1.128
325	0.965	0.973	0.981	0.991	1.000	1.009	1.018	1.027	1.035	1.043	1.063	1.080	1.097	1.112
350	0.939	0.947	0.955	0.964	0.974	0.983	0.992	1.002	1.010	1.020	1.041	1.061	1.078	1.095
375	0.91*	0.919	0.928	0.938	0.946	0.956	0.966	0.975	0.985	0.995	1.019	1.040	1.059	1.077
400	0.88*	0.891	0.900	0.907	0.917	0.928	0.938	0.947	0.958	0.969	0.995	1.018	1.039	1.058
425	--	0.86*	0.87*	0.88*	0.89*	0.898	0.909	0.918	0.930	0.942	0.971	0.995	1.018	1.039
450	--	0.83*	0.84*	0.85*	0.86*	0.87*	0.88*	0.888	0.900	0.913	0.945	0.971	0.996	1.018
475	--	--	--	--	--	0.84*	0.85*	0.856	0.869	0.883	0.918	0.946	0.974	0.997
500	--	--	--	--	--	--	--	0.822	0.837	0.852	0.890	0.920	0.950	0.975

* Extrapolated values

Uncertainties: 3-place figures ± 0.005
2-place figures ± 0.05

Table 15. Densities of 1 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.003	1.010	1.015	1.019	1.023	1.027	1.032	1.036	1.040	1.044	1.052	1.061	1.069	1.077
50	1.000	1.003	1.008	1.014	1.017	1.021	1.027	1.029	1.034	1.038	1.046	1.055	1.063	1.071
75	0.991	0.993	0.997	1.004	1.007	1.013	1.018	1.020	1.025	1.029	1.039	1.047	1.058	1.065
100	0.978	0.979	0.984	0.992	0.996	1.001	1.008	1.010	1.015	1.019	1.029	1.038	1.049	1.058
125	0.960	0.963	0.968	0.977	0.980	0.986	0.993	0.996	1.001	1.007	1.017	1.027	1.039	1.047
150	0.939	0.943	0.947	0.957	0.962	0.968	0.978	0.980	0.985	0.991	1.003	1.014	1.026	1.037
175	0.914	0.919	0.924	0.936	0.940	0.947	0.957	0.961	0.967	0.974	0.986	0.998	1.012	1.023
200	0.886	0.893	0.899	0.910	0.916	0.923	0.934	0.939	0.945	0.953	0.968	0.980	0.997	1.008
225	0.853	0.862	0.869	0.881	0.888	0.897	0.908	0.914	0.921	0.930	0.947	0.961	0.979	0.991
250	0.817	0.829	0.837	0.849	0.858	0.867	0.879	0.886	0.896	0.905	0.924	0.940	0.958	0.972
275	0.776	0.793	0.800	0.813	0.824	0.835	0.845	0.856	0.867	0.877	0.900	0.916	0.936	0.953
300	--	0.754	0.761	0.773	0.786	0.799	0.810	0.823	0.834	0.847	0.872	0.891	0.914	0.931
325	--	0.71*	0.719	0.731	0.746	0.760	0.770	0.788	0.801	0.814	0.843	0.864	0.887	0.907
350	--	--	0.68*	0.69*	0.703	0.719	0.729	0.750	0.764	0.777	0.811	0.835	0.860	0.882
375	--	--	--	--	0.66*	0.67*	0.68*	0.709	0.726	0.740	0.778	0.804	0.831	0.855
400	--	--	--	--	--	--	--	0.66*	0.68*	0.698	0.741	0.771	0.800	0.827
425	--	--	--	--	--	--	--	--	--	0.65*	0.699	0.735	0.766	0.796
450	--	--	--	--	--	--	--	--	--	--	0.65*	0.699	0.732	0.764
475	--	--	--	--	--	--	--	--	--	--	--	0.659	0.694	0.730
500	--	--	--	--	--	--	--	--	--	--	--	--	0.67*	0.695

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 16. Densities of 3 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.018	1.024	1.028	1.033	1.037	1.041	1.045	1.050	1.053	1.057	1.065	1.074	1.082	1.090
50	1.014	1.017	1.021	1.028	1.031	1.035	1.040	1.043	1.047	1.051	1.059	1.068	1.076	1.084
75	1.003	1.006	1.010	1.018	1.022	1.027	1.033	1.035	1.039	1.043	1.052	1.060	1.070	1.078
100	0.990	0.992	0.997	1.006	1.011	1.016	1.022	1.025	1.029	1.033	1.042	1.051	1.061	1.070
125	0.973	0.976	0.981	0.991	0.996	1.001	1.009	1.012	1.016	1.021	1.030	1.040	1.051	1.060
150	0.952	0.956	0.961	0.972	0.978	0.984	0.993	0.996	1.001	1.006	1.016	1.027	1.039	1.049
175	0.927	0.932	0.939	0.951	0.957	0.964	0.973	0.977	0.983	0.989	1.000	1.012	1.025	1.036
200	0.899	0.906	0.914	0.926	0.934	0.941	0.951	0.956	0.962	0.969	0.982	0.995	1.010	1.021
225	0.867	0.876	0.885	0.898	0.907	0.915	0.925	0.932	0.939	0.947	0.962	0.976	0.993	1.005
250	0.832	0.843	0.854	0.867	0.877	0.886	0.897	0.905	0.914	0.922	0.940	0.956	0.973	0.987
275	0.793	0.807	0.819	0.832	0.844	0.855	0.865	0.876	0.886	0.895	0.916	0.933	0.952	0.968
300	0.747	0.768	0.781	0.794	0.807	0.820	0.831	0.844	0.855	0.866	0.889	0.909	0.930	0.947
325	--	0.725	0.741	0.753	0.768	0.782	0.793	0.809	0.822	0.834	0.861	0.883	0.905	0.924
350	--	--	0.70*	0.71*	0.726	0.742	0.753	0.772	0.786	0.799	0.830	0.855	0.879	0.900
375	--	--	--	--	0.68*	0.70*	0.71*	0.732	0.748	0.763	0.798	0.825	0.851	0.874
400	--	--	--	--	--	--	--	0.69*	0.70*	0.724	0.763	0.793	0.821	0.847
425	--	--	--	--	--	--	--	--	--	0.68*	0.723	0.759	0.789	0.817
450	--	--	--	--	--	--	--	--	--	--	0.68*	0.725	0.757	0.787
475	--	--	--	--	--	--	--	--	--	--	--	0.687	0.721	0.755
500	--	--	--	--	--	--	--	--	--	--	--	0.66*	0.69*	0.722

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 17. Densities of 5 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.033	1.038	1.042	1.046	1.051	1.055	1.059	1.063	1.067	1.070	1.079	1.087	1.095	1.103
50	1.027	1.031	1.034	1.041	1.046	1.049	1.054	1.057	1.061	1.064	1.073	1.081	1.089	1.097
75	1.016	1.020	1.023	1.032	1.037	1.042	1.047	1.050	1.053	1.057	1.065	1.073	1.083	1.091
100	1.003	1.006	1.010	1.020	1.026	1.031	1.036	1.040	1.044	1.047	1.055	1.064	1.074	1.082
125	0.985	0.989	0.995	1.005	1.012	1.017	1.024	1.028	1.031	1.035	1.043	1.053	1.064	1.073
150	0.964	0.970	0.975	0.986	0.994	1.000	1.008	1.012	1.017	1.021	1.030	1.041	1.052	1.062
175	0.940	0.946	0.953	0.966	0.974	0.980	0.988	0.994	0.999	1.004	1.014	1.026	1.038	1.049
200	0.913	0.920	0.929	0.941	0.952	0.958	0.967	0.973	0.978	0.985	0.996	1.010	1.023	1.035
225	0.882	0.890	0.901	0.914	0.926	0.933	0.942	0.951	0.957	0.963	0.977	0.991	1.007	1.019
250	0.848	0.857	0.871	0.885	0.896	0.905	0.915	0.924	0.932	0.939	0.955	0.971	0.987	1.002
275	0.809	0.821	0.838	0.851	0.864	0.875	0.884	0.896	0.905	0.913	0.932	0.950	0.967	0.983
300	0.765	0.783	0.802	0.815	0.828	0.841	0.852	0.865	0.876	0.885	0.906	0.926	0.946	0.963
325	--	0.741	0.764	0.776	0.790	0.804	0.816	0.831	0.843	0.854	0.879	0.902	0.922	0.941
350	--	0.70*	0.72*	0.734	0.749	0.765	0.777	0.794	0.808	0.821	0.849	0.875	0.897	0.918
375	--	0.66*	0.68*	0.69*	0.700	0.709	0.725	0.755	0.770	0.786	0.819	0.846	0.871	0.893
400	--	--	--	--	0.678	0.694	0.709	0.720	0.731	0.748	0.785	0.815	0.842	0.867
425	--	--	--	--	0.64*	0.65*	0.666	0.676	0.687	0.716	0.747	0.783	0.812	0.839
450	--	--	--	--	--	--	0.625	0.635	0.645	0.681	0.711	0.750	0.781	0.810
475	--	--	--	--	--	--	--	--	--	0.64*	0.676	0.714	0.747	0.779
500	--	--	--	--	--	--	--	--	--	--	0.63*	0.677	0.718	0.748

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 18. Densities of 7 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.049	1.052	1.055	1.060	1.065	1.069	1.073	1.077	1.080	1.084	1.093	1.101	1.109	1.116
50	1.041	1.045	1.048	1.055	1.060	1.064	1.068	1.071	1.075	1.078	1.086	1.094	1.102	1.110
75	1.030	1.034	1.037	1.046	1.052	1.056	1.061	1.064	1.067	1.071	1.078	1.085	1.096	1.104
100	1.015	1.020	1.024	1.034	1.041	1.046	1.050	1.055	1.058	1.061	1.068	1.077	1.087	1.095
125	0.998	1.003	1.008	1.019	1.028	1.032	1.038	1.043	1.046	1.050	1.057	1.067	1.077	1.086
150	0.977	0.983	0.988	1.001	1.011	1.016	1.022	1.028	1.032	1.036	1.043	1.054	1.065	1.075
175	0.954	0.960	0.968	0.980	0.991	0.997	1.004	1.011	1.015	1.019	1.028	1.040	1.051	1.062
200	0.927	0.934	0.944	0.957	0.969	0.975	0.983	0.990	0.995	1.001	1.011	1.024	1.037	1.048
225	0.897	0.904	0.917	0.931	0.944	0.951	0.959	0.968	0.974	0.980	0.992	1.006	1.021	1.033
250	0.864	0.872	0.888	0.902	0.915	0.924	0.933	0.942	0.949	0.956	0.971	0.987	1.003	1.016
275	0.827	0.837	0.857	0.870	0.884	0.894	0.903	0.915	0.923	0.930	0.948	0.966	0.983	0.998
300	0.784	0.799	0.823	0.835	0.849	0.861	0.872	0.884	0.895	0.903	0.923	0.944	0.962	0.978
325	--	0.758	0.786	0.798	0.812	0.826	0.837	0.851	0.863	0.873	0.897	0.920	0.940	0.957
350	--	0.72*	0.74*	0.757	0.772	0.788	0.800	0.816	0.829	0.842	0.869	0.894	0.916	0.935
375	--	0.68*	0.70*	0.71*	0.732	0.748	0.764	0.778	0.792	0.808	0.839	0.866	0.890	0.911
400	--	--	--	--	0.69*	0.70*	0.725	0.741	0.757	0.772	0.807	0.837	0.863	0.886
425	--	--	--	--	--	--	0.69*	0.71*	0.715	0.732	0.771	0.806	0.834	0.860
450	--	--	--	--	--	--	--	--	0.67*	0.69*	0.741	0.774	0.804	0.832
475	--	--	--	--	--	--	--	--	--	--	0.71*	0.740	0.772	0.802
500	--	--	--	--	--	--	--	--	--	--	--	0.707	0.744	0.774

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 19. Densities of 9 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.064	1.067	1.070	1.074	1.079	1.083	1.087	1.091	1.094	1.098	1.107	1.114	1.122	1.129
50	1.055	1.059	1.062	1.069	1.075	1.078	1.082	1.085	1.089	1.092	1.100	1.108	1.116	1.123
75	1.043	1.048	1.051	1.060	1.067	1.070	1.074	1.079	1.082	1.085	1.092	1.100	1.109	1.117
100	1.029	1.034	1.037	1.048	1.056	1.060	1.064	1.070	1.073	1.075	1.082	1.091	1.100	1.108
125	1.011	1.017	1.022	1.034	1.043	1.047	1.052	1.059	1.061	1.064	1.071	1.081	1.090	1.099
150	0.991	0.997	1.003	1.016	1.026	1.031	1.037	1.044	1.047	1.050	1.057	1.068	1.078	1.088
175	0.967	0.974	0.983	0.995	1.008	1.013	1.019	1.027	1.031	1.034	1.042	1.055	1.065	1.075
200	0.941	0.949	0.960	0.973	0.985	0.992	0.998	1.007	1.011	1.016	1.025	1.039	1.050	1.062
225	0.912	0.919	0.933	0.947	0.961	0.968	0.975	0.985	0.991	0.996	1.007	1.021	1.035	1.047
250	0.880	0.888	0.906	0.920	0.933	0.942	0.950	0.960	0.967	0.972	0.986	1.003	1.018	1.031
275	0.845	0.853	0.876	0.889	0.903	0.913	0.922	0.933	0.941	0.948	0.965	0.983	0.999	1.014
300	0.803	0.816	0.843	0.855	0.869	0.881	0.892	0.904	0.915	0.921	0.940	0.961	0.978	0.994
325	--	0.777	0.808	0.819	0.834	0.847	0.859	0.872	0.883	0.893	0.915	0.938	0.957	0.974
350	--	0.73*	0.773	0.785	0.795	0.810	0.823	0.837	0.850	0.862	0.888	0.912	0.934	0.953
375	--	0.69*	0.73*	0.737	0.754	0.770	0.786	0.800	0.813	0.830	0.859	0.886	0.909	0.930
400	--	--	--	0.69*	0.71*	0.73*	0.748	0.764	0.780	0.795	0.828	0.858	0.883	0.905
425	--	--	--	--	--	--	0.70*	0.72*	0.738	0.755	0.794	0.829	0.856	0.880
450	--	--	--	--	--	--	--	--	0.69*	0.71*	0.765	0.798	0.827	0.853
475	--	--	--	--	--	--	--	--	--	--	0.734	0.765	0.796	0.825
500	--	--	--	--	--	--	--	--	--	--	0.70*	0.733	0.770	0.798

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 20. Densities of 11 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.080	1.082	1.085	1.089	1.094	1.098	1.101	1.105	1.108	1.112	1.121	1.128	1.136	1.143
50	1.069	1.073	1.076	1.084	1.089	1.092	1.096	1.100	1.103	1.106	1.114	1.122	1.130	1.137
75	1.057	1.063	1.065	1.074	1.081	1.085	1.088	1.094	1.096	1.099	1.106	1.114	1.122	1.130
100	1.042	1.048	1.051	1.062	1.071	1.075	1.078	1.085	1.087	1.089	1.096	1.105	1.113	1.121
125	1.025	1.031	1.036	1.048	1.058	1.062	1.066	1.073	1.076	1.078	1.084	1.095	1.103	1.112
150	1.004	1.012	1.017	1.030	1.042	1.046	1.051	1.059	1.061	1.065	1.071	1.082	1.092	1.101
175	0.982	0.989	0.997	1.011	1.024	1.028	1.034	1.042	1.046	1.049	1.057	1.069	1.079	1.089
200	0.956	0.964	0.975	0.988	1.002	1.008	1.014	1.024	1.027	1.031	1.040	1.053	1.064	1.076
225	0.928	0.935	0.950	0.964	0.978	0.985	0.991	1.002	1.007	1.012	1.022	1.036	1.050	1.062
250	0.897	0.904	0.923	0.937	0.951	0.959	0.967	0.978	0.984	0.989	1.002	1.019	1.033	1.046
275	0.863	0.870	0.895	0.908	0.922	0.932	0.940	0.951	0.958	0.965	0.981	0.999	1.015	1.029
300	0.823	0.834	0.863	0.875	0.889	0.901	0.911	0.923	0.933	0.939	0.957	0.978	0.994	1.010
325	--	0.796	0.829	0.841	0.855	0.867	0.879	0.892	0.903	0.911	0.933	0.956	0.974	0.990
350	--	0.76*	0.795	0.807	0.817	0.832	0.845	0.858	0.870	0.882	0.906	0.931	0.951	0.970
375	--	--	0.75*	0.763	0.772	0.790	0.818	0.822	0.834	0.851	0.879	0.905	0.928	0.948
400	--	--	--	0.72*	0.730	0.751	0.784	0.788	0.804	0.818	0.849	0.879	0.903	0.924
425	--	--	--	--	0.69*	0.702	0.741	0.745	0.764	0.780	0.817	0.851	0.877	0.900
450	--	--	--	--	--	0.67*	0.703	0.709	0.730	0.748	0.789	0.821	0.850	0.875
475	--	--	--	--	--	--	0.66*	0.67*	0.69*	0.71*	0.761	0.789	0.820	0.847
500	--	--	--	--	--	--	--	--	--	--	0.73*	0.760	0.794	0.822

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 21. Densities of 13 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.095	1.097	1.100	1.103	1.109	1.112	1.116	1.119	1.123	1.126	1.135	1.142	1.150	1.157
50	1.083	1.088	1.090	1.098	1.104	1.107	1.110	1.114	1.117	1.120	1.128	1.135	1.144	1.151
75	1.071	1.077	1.079	1.088	1.096	1.099	1.102	1.108	1.110	1.113	1.119	1.129	1.136	1.144
100	1.055	1.062	1.065	1.076	1.085	1.089	1.092	1.099	1.101	1.103	1.109	1.119	1.127	1.135
125	1.038	1.045	1.050	1.062	1.073	1.076	1.080	1.088	1.090	1.092	1.098	1.108	1.117	1.126
150	1.018	1.026	1.032	1.045	1.057	1.061	1.065	1.074	1.076	1.079	1.085	1.096	1.106	1.115
175	0.996	1.003	1.013	1.026	1.040	1.044	1.049	1.058	1.061	1.064	1.071	1.083	1.093	1.103
200	0.971	0.979	0.991	1.004	1.018	1.024	1.030	1.039	1.042	1.047	1.055	1.068	1.078	1.090
225	0.944	0.951	0.966	0.980	0.995	1.002	1.008	1.019	1.023	1.027	1.037	1.052	1.064	1.076
250	0.914	0.921	0.940	0.954	0.968	0.976	0.984	0.995	1.000	1.006	1.018	1.034	1.048	1.061
275	0.882	0.888	0.913	0.926	0.940	0.950	0.958	0.969	0.975	0.982	0.997	1.016	1.030	1.044
300	0.843	0.853	0.883	0.895	0.908	0.920	0.930	0.941	0.952	0.957	0.974	0.995	1.011	1.026
325	--	0.816	0.850	0.862	0.875	0.888	0.900	0.911	0.922	0.930	0.951	0.973	0.990	1.007
350	--	0.77*	0.818	0.827	0.839	0.853	0.866	0.878	0.890	0.902	0.925	0.949	0.969	0.987
375	--	--	0.782	0.791	0.801	0.817	0.832	0.843	0.855	0.872	0.898	0.925	0.946	0.966
400	--	--	0.770	0.777	0.786	0.794	0.811	0.822	0.833	0.840	0.869	0.899	0.922	0.943
425	--	--	0.71*	0.72*	0.73*	0.738	0.757	0.767	0.778	0.808	0.839	0.872	0.897	0.920
450	--	--	--	--	--	0.704	0.724	0.735	0.745	0.774	0.803	0.843	0.871	0.895
475	--	--	--	--	--	0.67*	0.69*	0.701	0.713	0.746	0.773	0.813	0.843	0.869
500	--	--	--	--	--	--	--	0.67*	0.68*	0.70*	0.743	0.775	0.820	0.845

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 22. Densities of 15 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.111	1.112	1.115	1.119	1.124	1.127	1.130	1.134	1.137	1.141	1.150	1.156	1.164	1.171
50	1.098	1.103	1.105	1.113	1.119	1.122	1.125	1.129	1.132	1.135	1.143	1.150	1.158	1.165
75	1.085	1.092	1.094	1.103	1.111	1.114	1.117	1.123	1.125	1.128	1.134	1.142	1.150	1.158
100	1.069	1.077	1.080	1.091	1.100	1.104	1.107	1.114	1.116	1.118	1.124	1.133	1.141	1.149
125	1.052	1.060	1.065	1.077	1.088	1.091	1.095	1.103	1.105	1.107	1.113	1.123	1.131	1.140
150	1.033	1.041	1.047	1.060	1.072	1.076	1.080	1.089	1.091	1.094	1.100	1.111	1.120	1.129
175	1.011	1.019	1.028	1.041	1.055	1.059	1.064	1.073	1.076	1.079	1.086	1.098	1.107	1.117
200	0.987	0.995	1.007	1.020	1.034	1.040	1.045	1.055	1.059	1.062	1.070	1.083	1.093	1.105
225	0.961	0.967	0.982	0.996	1.012	1.018	1.024	1.035	1.039	1.043	1.053	1.067	1.079	1.091
250	0.932	0.938	0.957	0.971	0.985	0.993	1.001	1.012	1.017	1.022	1.034	1.050	1.063	1.076
275	0.901	0.907	0.931	0.944	0.958	0.967	0.975	0.986	0.992	0.998	1.014	1.032	1.046	1.060
300	0.865	0.873	0.902	0.914	0.927	0.938	0.948	0.959	0.969	0.974	0.991	1.012	1.027	1.042
325	--	0.838	0.871	0.882	0.895	0.907	0.919	0.930	0.940	0.948	0.968	0.990	1.008	1.024
350	--	0.79*	0.839	0.848	0.860	0.874	0.887	0.898	0.909	0.921	0.943	0.967	0.986	1.005
375	--	--	0.804	0.812	0.822	0.838	0.853	0.864	0.875	0.892	0.917	0.943	0.964	0.983
400	--	--	0.768	0.773	0.782	0.800	0.817	0.828	0.839	0.861	0.889	0.918	0.941	0.961
425	--	--	0.73*	0.74*	0.75*	0.760	0.779	0.789	0.800	0.829	0.860	0.892	0.917	0.939
450	--	--	--	--	--	0.718	0.739	0.749	0.759	0.794	0.824	0.865	0.892	0.915
475	--	--	--	--	--	0.67*	0.69*	0.705	0.716	0.762	0.795	0.835	0.865	0.890
500	--	--	--	--	--	--	--	0.66*	0.68*	0.72*	0.768	0.808	0.842	0.867

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 23. Densities of 17 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.126	1.128	1.131	1.134	1.139	1.142	1.145	1.149	1.152	1.155	1.165	1.171	1.178	1.185
50	1.113	1.118	1.120	1.128	1.133	1.136	1.139	1.143	1.146	1.149	1.157	1.164	1.172	1.179
75	1.100	1.105	1.108	1.117	1.125	1.128	1.131	1.137	1.139	1.142	1.148	1.155	1.164	1.171
100	1.084	1.091	1.094	1.105	1.114	1.118	1.121	1.128	1.130	1.132	1.138	1.147	1.155	1.163
125	1.067	1.074	1.079	1.091	1.102	1.105	1.109	1.117	1.119	1.121	1.127	1.137	1.145	1.153
150	1.047	1.055	1.061	1.074	1.086	1.090	1.094	1.103	1.105	1.108	1.114	1.125	1.134	1.143
175	1.026	1.034	1.043	1.056	1.069	1.073	1.078	1.087	1.090	1.093	1.100	1.112	1.121	1.131
200	1.002	1.011	1.022	1.035	1.049	1.055	1.059	1.069	1.073	1.076	1.085	1.097	1.107	1.119
225	0.977	0.985	0.999	1.013	1.027	1.033	1.039	1.050	1.054	1.058	1.068	1.082	1.093	1.105
250	0.950	0.956	0.975	0.988	1.002	1.010	1.017	1.028	1.032	1.037	1.049	1.065	1.078	1.091
275	0.921	0.926	0.949	0.962	0.976	0.984	0.992	1.003	1.009	1.015	1.030	1.048	1.061	1.075
300	0.886	0.894	0.922	0.933	0.946	0.956	0.966	0.977	0.986	0.991	1.008	1.028	1.043	1.057
325	0.85*	0.860	0.892	0.903	0.915	0.927	0.938	0.949	0.958	0.966	0.986	1.008	1.024	1.040
350	--	0.82*	0.861	0.870	0.882	0.895	0.908	0.918	0.928	0.940	0.961	0.985	1.004	1.022
375	--	0.78*	0.821	0.834	0.844	0.860	0.874	0.885	0.896	0.912	0.936	0.962	0.982	1.001
400	--	--	0.79*	0.796	0.805	0.823	0.840	0.851	0.862	0.882	0.909	0.937	0.960	0.979
425	--	--	--	0.76*	0.77*	0.791	0.811	0.821	0.832	0.852	0.882	0.912	0.937	0.958
450	--	--	--	--	--	0.739	0.759	0.770	0.780	0.815	0.845	0.885	0.913	0.935
475	--	--	--	--	--	0.708	0.734	0.746	0.757	0.787	0.817	0.857	0.887	0.911
500	--	--	--	--	--	0.67*	0.69*	0.72*	0.74*	0.75*	0.789	0.829	0.863	0.888

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 24. Densities of 19 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.141	1.144	1.146	1.150	1.154	1.158	1.161	1.164	1.167	1.170	1.180	1.185	1.193	1.199
50	1.128	1.133	1.135	1.142	1.148	1.151	1.154	1.158	1.161	1.164	1.172	1.179	1.186	1.193
75	1.114	1.121	1.123	1.132	1.139	1.142	1.145	1.151	1.153	1.156	1.163	1.170	1.178	1.186
100	1.098	1.106	1.109	1.120	1.128	1.132	1.135	1.142	1.144	1.146	1.153	1.161	1.169	1.177
125	1.081	1.089	1.094	1.105	1.115	1.119	1.123	1.131	1.133	1.135	1.141	1.151	1.159	1.168
150	1.062	1.071	1.076	1.089	1.100	1.104	1.108	1.117	1.119	1.122	1.129	1.139	1.148	1.157
175	1.041	1.050	1.058	1.071	1.083	1.088	1.092	1.101	1.104	1.108	1.115	1.127	1.135	1.145
200	1.019	1.027	1.038	1.051	1.063	1.069	1.074	1.084	1.087	1.091	1.100	1.112	1.122	1.133
225	0.995	1.002	1.015	1.029	1.042	1.048	1.054	1.065	1.069	1.073	1.083	1.097	1.108	1.120
250	0.969	0.975	0.992	1.005	1.018	1.026	1.033	1.043	1.048	1.053	1.065	1.081	1.093	1.105
275	0.941	0.946	0.967	0.980	0.992	1.001	1.009	1.020	1.025	1.031	1.046	1.063	1.077	1.090
300	0.908	0.915	0.941	0.952	0.964	0.974	0.984	0.994	1.003	1.009	1.025	1.044	1.059	1.073
325	0.87*	0.884	0.912	0.923	0.935	0.946	0.957	0.967	0.976	0.984	1.004	1.024	1.041	1.056
350	--	0.870	0.880	0.892	0.903	0.915	0.927	0.937	0.947	0.959	0.979	1.003	1.021	1.038
375	--	0.837	0.848	0.858	0.870	0.882	0.893	0.906	0.916	0.931	0.955	0.980	1.000	1.018
400	--	0.803	0.814	0.823	0.835	0.848	0.859	0.871	0.887	0.899	0.929	0.956	0.978	0.997
425	--	0.77*	0.78*	0.786	0.796	0.812	0.823	0.838	0.855	0.869	0.902	0.932	0.956	0.977
450	--	--	--	0.75*	0.76*	0.77*	0.785	0.803	0.821	0.836	0.872	0.904	0.932	0.954
475	--	--	--	--	--	--	0.745	0.765	0.786	0.802	0.842	0.876	0.908	0.931
500	--	--	--	--	--	--	0.70*	0.725	0.748	0.766	0.810	0.842	0.880	0.909

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

Table 25. Densities of 21 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.157	1.160	1.162	1.166	1.170	1.173	1.176	1.179	1.182	1.185	1.195	1.200	1.207	1.214
50	1.143	1.148	1.151	1.158	1.163	1.166	1.169	1.173	1.176	1.179	1.187	1.193	1.201	1.207
75	1.129	1.136	1.139	1.147	1.154	1.157	1.160	1.166	1.168	1.171	1.177	1.185	1.192	1.200
100	1.113	1.121	1.124	1.134	1.142	1.146	1.149	1.156	1.158	1.161	1.167	1.176	1.183	1.191
125	1.096	1.104	1.109	1.120	1.129	1.133	1.137	1.144	1.147	1.149	1.156	1.166	1.173	1.182
150	1.077	1.086	1.092	1.104	1.114	1.118	1.122	1.130	1.133	1.136	1.144	1.154	1.162	1.171
175	1.057	1.066	1.073	1.086	1.097	1.102	1.107	1.115	1.118	1.122	1.130	1.141	1.150	1.160
200	1.035	1.044	1.054	1.066	1.078	1.083	1.088	1.098	1.102	1.106	1.115	1.127	1.136	1.148
225	1.012	1.020	1.032	1.045	1.057	1.063	1.069	1.079	1.083	1.088	1.099	1.112	1.123	1.135
250	0.988	0.994	1.009	1.022	1.034	1.041	1.048	1.058	1.063	1.069	1.081	1.096	1.108	1.121
275	0.962	0.967	0.985	0.997	1.009	1.018	1.025	1.036	1.041	1.047	1.062	1.079	1.092	1.105
300	0.931	0.938	0.960	0.971	0.982	0.991	1.001	1.019	1.025	1.042	1.060	1.070	1.079	1.089
325	0.901	0.908	0.932	0.943	0.954	0.964	0.975	0.985	0.993	1.002	1.021	1.041	1.057	1.072
350	--	0.893	0.902	0.912	0.923	0.935	0.947	0.956	0.966	0.977	0.997	1.020	1.037	1.055
375	--	0.864	0.873	0.880	0.892	0.904	0.914	0.926	0.936	0.950	0.974	0.997	1.017	1.036
400	--	0.832	0.843	0.849	0.858	0.872	0.885	0.899	0.910	0.922	0.948	0.974	0.996	1.015
425	--	0.80*	0.81*	0.82*	0.83*	0.837	0.852	0.863	0.872	0.890	0.922	0.951	0.974	0.995
450	--	--	--	--	--	0.80*	0.82*	0.83*	0.849	0.863	0.898	0.925	0.951	0.973
475	--	--	--	--	--	--	--	--	0.819	0.835	0.868	0.899	0.927	0.951
500	--	--	--	--	--	--	--	--	0.78*	0.80*	0.837	0.868	0.903	0.928

*Extrapolated values

Uncertainties: 3-place figures ± 0.005
 2-place figures ± 0.05

Table 26. Densities of 23 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.172	1.176	1.179	1.182	1.186	1.189	1.192	1.195	1.198	1.201	1.211	1.215	1.222	1.228
50	1.159	1.164	1.167	1.173	1.178	1.181	1.184	1.188	1.191	1.194	1.202	1.208	1.216	1.222
75	1.145	1.151	1.154	1.162	1.168	1.171	1.174	1.180	1.182	1.185	1.192	1.200	1.207	1.214
100	1.128	1.136	1.140	1.149	1.156	1.160	1.163	1.170	1.172	1.175	1.182	1.191	1.198	1.206
125	1.111	1.119	1.124	1.134	1.142	1.146	1.151	1.158	1.161	1.164	1.171	1.180	1.188	1.196
150	1.093	1.102	1.107	1.118	1.127	1.131	1.136	1.144	1.147	1.150	1.159	1.169	1.177	1.186
175	1.073	1.082	1.089	1.101	1.110	1.115	1.121	1.129	1.132	1.136	1.145	1.156	1.165	1.175
200	1.052	1.061	1.069	1.081	1.091	1.097	1.102	1.112	1.116	1.120	1.130	1.142	1.151	1.163
225	1.030	1.039	1.048	1.061	1.071	1.078	1.084	1.093	1.098	1.103	1.114	1.127	1.138	1.150
250	1.007	1.015	1.027	1.039	1.049	1.056	1.063	1.073	1.078	1.084	1.097	1.111	1.123	1.136
275	0.983	0.989	1.003	1.015	1.025	1.033	1.041	1.051	1.057	1.063	1.078	1.094	1.107	1.120
300	0.955	0.961	0.978	0.989	0.999	1.009	1.017	1.027	1.035	1.041	1.059	1.076	1.090	1.105
325	0.927	0.933	0.952	0.962	0.973	0.982	0.993	1.002	1.011	1.018	1.038	1.057	1.073	1.088
350	0.90*	0.915	0.924	0.934	0.944	0.955	0.965	0.975	0.984	0.994	1.015	1.037	1.054	1.071
375	--	0.886	0.895	0.904	0.914	0.925	0.936	0.946	0.956	0.968	0.992	1.015	1.034	1.052
400	--	0.855	0.865	0.872	0.882	0.894	0.906	0.917	0.928	0.941	0.967	0.992	1.014	1.033
425	--	0.825	0.836	0.843	0.849	0.861	0.874	0.885	0.898	0.912	0.942	0.969	0.992	1.013
450	--	0.78*	0.79*	0.80*	0.813	0.823	0.843	0.855	0.868	0.882	0.915	0.944	0.970	0.991
475	--	--	--	--	0.77*	0.79*	0.80*	0.820	0.837	0.853	0.888	0.918	0.947	0.970
500	--	--	--	--	--	--	--	0.78*	0.80*	0.817	0.856	0.889	0.922	0.947

*Extrapolated values

Uncertainties: 3-place figures ±.005
2-place figures ±.05

Table 27. Densities of 25 wt. % NaCl solutions, g/cm³

Temp °C	Pressure (Bars)													
	100	200	300	400	500	600	700	800	900	1000	1250	1500	1750	2000
25	1.188	1.192	1.195	1.199	1.202	1.205	1.207	1.211	1.213	1.217	1.226	1.231	1.237	1.243
50	1.175	1.179	1.183	1.188	1.193	1.196	1.200	1.204	1.207	1.210	1.217	1.224	1.231	1.237
75	1.160	1.167	1.170	1.177	1.182	1.185	1.189	1.194	1.197	1.200	1.208	1.215	1.222	1.229
100	1.143	1.152	1.155	1.164	1.169	1.173	1.177	1.183	1.186	1.190	1.198	1.206	1.213	1.221
125	1.127	1.135	1.140	1.149	1.155	1.160	1.164	1.171	1.174	1.178	1.186	1.195	1.203	1.211
150	1.109	1.117	1.122	1.133	1.140	1.145	1.150	1.157	1.161	1.164	1.174	1.184	1.192	1.201
175	1.090	1.099	1.104	1.116	1.123	1.129	1.134	1.142	1.146	1.150	1.160	1.171	1.180	1.190
200	1.070	1.078	1.085	1.097	1.105	1.111	1.116	1.125	1.129	1.134	1.146	1.157	1.167	1.178
225	1.049	1.058	1.065	1.075	1.085	1.091	1.098	1.107	1.111	1.117	1.130	1.142	1.154	1.165
250	1.027	1.035	1.044	1.055	1.064	1.071	1.078	1.087	1.092	1.099	1.112	1.127	1.139	1.151
275	1.004	1.011	1.021	1.032	1.041	1.049	1.057	1.066	1.072	1.079	1.094	1.110	1.123	1.136
300	0.979	0.986	0.997	1.007	1.017	1.025	1.033	1.043	1.050	1.057	1.075	1.092	1.106	1.120
325	0.952	0.960	0.971	0.981	0.991	1.001	1.010	1.019	1.027	1.035	1.055	1.073	1.089	1.104
350	0.926	0.937	0.945	0.954	0.964	0.974	0.983	0.993	1.002	1.012	1.033	1.053	1.070	1.087
375	0.90*	0.908	0.917	0.924	0.934	0.945	0.955	0.965	0.975	0.986	1.010	1.032	1.051	1.069
400	0.87*	0.877	0.886	0.893	0.903	0.915	0.925	0.936	0.947	0.960	0.986	1.010	1.031	1.050
425	--	0.84*	0.855	0.861	0.871	0.883	0.894	0.905	0.918	0.932	0.961	0.986	1.010	1.031
450	--	--	0.81*	0.82*	0.83*	0.848	0.861	0.874	0.887	0.902	0.934	0.963	0.988	1.010
475	--	--	--	--	--	0.81*	0.82*	0.836	0.857	0.871	0.905	0.937	0.965	0.988
500	--	--	--	--	--	--	--	0.812	0.827	0.842	0.880	0.910	0.940	0.965

*Extrapolated values

Uncertainties: 3-place figures ±.005
 2-place figures ±.05

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