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Authors
Rogers, P.S.Z.
Pitzer, K.S.

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Lawrence Berkeley Laboratory
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P.S.Z. Rogers and Kenneth S. Pitzer

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Volumetric Properties of Aqueous Sodium Chloride Solutions

P. S. Z. Rogers and Kenneth S. Pitzer

Department of Chemistry and Lawrence Berkeley Laboratory
University of California, Berkeley, California 94720

Literature data for the volumetric properties of sodium chloride solutions to concentrations of 5.5 molal have been compiled and critically evaluated. A semi-empirical equation of the same type found to be effective in describing the thermal properties of NaCl solutions has been used to reproduce the volumetric data from 0°C to 300°C and 1 bar to 1000 bar. Tables of values are given for the specific volume, expansivity, and compressibility. Equations also are given for calculating the pressure dependence of the free energy, enthalpy, and heat capacity. These equations can be combined with a treatment of thermal properties to form a complete equation of state for sodium chloride solutions.

Key Words: Apparent molal volume; aqueous sodium chloride solutions; compressibility; density; equation of state; expansivity; Pitzer's equations; PVT; volume; volumetric properties.

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Contents

List of Symbols

A_ϕ, A_V, A_X, A_k, A_H, A_J	Debye-Huckel slopes for the osmotic coefficient, volume, expansivity, compressibility, enthalpy, and heat capacity
B_{MX}	Parameter in Pitzer's equations
B^V_{MX}	Pressure derivative of B_{MX}
C^ϕ_{MX}, C_{MX}	Parameters in Pitzer's equations
C^V_{MX}	Pressure derivative of C_{MX}
C_p	Total heat capacity of the solution at constant pressure
$\bar{C}^\circ_{p_1}$, $\bar{C}^\circ_{p_2}$	Partial molal heat capacity of solvent and solute at infinite dilution at constant pressure
$^\phi C_p$	Apparent molal heat capacity at constant pressure
D	Dielectric constant of pure water
d_w	Density of pure water
G	Total Gibbs energy of the solution
G^{EX}	Excess Gibbs energy of the solution
$\bar{G}^\circ_1$, $\bar{G}^\circ_2$	Partial molal Gibbs energy of solvent and solute in their standard states
$\bar{G}^{EX}_1$, $\bar{G}^{EX}_2$	Partial molal excess Gibbs energy of solvent and solute
h(I)	Function defined by eq (13)
H	Total enthalpy of the solution

H°	Total enthalpy of the solution in its standard state
$\bar{H}_2^{\circ}$	Partial molal enthalpy of the solute at infinite dilution
$\Delta\bar{H}_S$, $\Delta\bar{H}_D$	Molar heat of solution and dilution
$\bar{H}(s)$	Molar enthalpy of solid sodium chloride
I	Ionic strength
k	Boltzmann's constant
L	Relative molal enthalpy
ϕ_L	Apparent molal enthalpy
M_w	Molecular weight of water
M_2	Molecular weight of the solute
m	Molality
N_0	Avagadro's number
n_1, n_2	Moles of solvent, solute
P	Pressure, bar
R	Gas constant
S^{EX}	Excess entropy of the solution
T	Temperature, Kelvins
U_1-U_{28}	Adjustable constants
V	Total volume of the solution
$\bar{V}_1^{\circ}$, $\bar{V}_2^{\circ}$	Partial molal volume of the solvent and solute at infinite dilution
ϕ_V	Apparent molal volume
$\bar{V}(s)$	Molar volume of solid sodium chloride
v	Specific volume of the solution
v_w	Specific volume of pure water
z_i	Charge of ion i

Greek Symbols

$\beta_{MX}^{(0)}$, $\beta_{MX}^{(1)}$	Parameters in Pitzer's equations
$\gamma_{\pm}$	Mean activity coefficient
ν	Number of ions
ϕ	Osmotic coefficient

1. Introduction

Sodium chloride is the major electrolyte in most natural waters and geothermal fluids. Therefore, an accurate description of the properties of aqueous sodium chloride solutions is the first step in developing a model to represent these systems at high temperatures and pressures. While the volumetric properties of NaCl solutions are of interest in their own right for many research, industrial, and engineering design applications, they are also important because they give the pressure dependence of the free energy, enthalpy, and heat capacity. Equations which are effective in describing the thermal properties of sodium chloride solutions have been used to reproduce the volumetric data. This choice makes it possible to combine the fitting equations for thermal and volumetric properties to form a complete equation of state for sodium chloride solutions.

The parametric fit of NaCl solution volumetric properties presented here differs from other descriptions found in the literature [1-3][1] in three important aspects. First, known values of the Debye-Hückel slopes for the apparent molal volume have been included in the fitting equations. Previous descriptions have commonly ignored the theoretical constraint of a Debye-Hückel term. Secondly, every attempt has been made to reproduce the data to its experimental accuracy and to assure that the derived values for expansivity and compressibility are reasonable and vary smoothly with temperature, pressure, and molality. Third, the recent volumetric data of Franck and Hilbert [4] at high temperatures provide a much more accurate data base in that region. Although of lesser importance, new measurements from this laboratory [5] improve the accuracy at high concentration in the range from 75°C to 200°C.

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

2. Review of Pitzer's Equations

The excess Gibbs free energy, G^{EX}, of a system is the difference between the Gibbs energy of the real system and that of an ideal system under the same conditions. In a solution containing n_1 moles of solvent and n_2 moles of solute,

$$G^{EX} = n_1\bar{G}_1^{EX} + n_2\bar{G}_2^{EX} \tag{1}$$

where $\bar{G}_i^{EX}$ is the partial molal excess Gibbs energy of component i. For a completely dissociated electrolyte dissolved in n_1 moles of water, the osmotic and activity coefficients are given by

$$\phi-1 = -\frac{1000}{\nu m M_w RT}\left(\frac{\partial G^{EX}}{\partial n_1}\right)_{T,P,n_2} \tag{2}$$

and

$$\ln\gamma_{\pm} = \frac{1}{\nu RT}\left(\frac{\partial G^{EX}}{\partial n_2}\right)_{T,P,n_1} \tag{3}$$

where m is the molality of the solute, ν is the total number of ions formed from the dissociation of the salt, M_w is the molecular weight of water, R is the gas constant, and T is the temperature in Kelvins.

The parametric equation used by Pitzer [6] for the excess Gibbs energy of a binary electrolyte solution containing 1 kg of solvent is

$$\frac{1000G^{EX}}{n_1 M_w RT} = -A_\phi\left(\frac{4I}{b}\right)\ln(1+bI^{1/2}) + m^2\, 2\nu_M\nu_X\{\beta^{(0)} + \frac{2\beta^{(1)}}{\alpha^2 I}[1-(1+\alpha I^{1/2})\, e^{-\alpha I^{1/2}}]\} + m^3(\nu_M\nu_X)^{3/2}\, C^\phi_{MX}. \tag{4}$$

The corresponding equations for the osmotic and activity coefficients are

$$\phi-1 = -|z_M z_X|\ A_\phi \frac{I^{1/2}}{1+bI^{1/2}} + m\,\frac{2\nu_M\nu_X}{\nu}\left(\beta_{MX}^{(0)} + \beta_{MX}^{(1)}\ e^{-\alpha I^{1/2}}\right) + m^2\,\frac{2(\nu_M\nu_X)^{3/2}}{\nu}\,C_{MX}^{\phi} \quad (5)$$

$$\ln\gamma_\pm = -|z_M z_X|\ A_\phi\left(\frac{I^{1/2}}{1+bI^{1/2}} + \frac{2}{b}\ln(1+bI^{1/2})\right) +$$

$$m\,\frac{2\nu_M\nu_X}{\nu}\left(2\beta_{MX}^{(0)} + \frac{2\beta_{MX}^{(1)}}{\alpha^2 I}\ [1-(1+\alpha I^{1/2} - \frac{\alpha^2 I}{2})\ e^{-\alpha I^{1/2}}]\right) + \frac{3m^2}{2}\left(\frac{2(\nu_M\nu_X)^{3/2}}{\nu}\,C_{MX}^{\phi}\right). \quad (6)$$

where the electrolyte MX contains ν_M and ν_X ions of charge z_M and z_X, and $\nu = \nu_M + \nu_X$. I is the ionic strength,

$$I = 1/2 \sum_i m_i z_i^2,$$

and A_ϕ is the Debye-Hückel slope for the osmotic coefficient for which values are given by Bradley and Pitzer [7],

$$A_\phi = \frac{1}{3}\left(\frac{2\pi N_0 d_w}{1000}\right)^{1/2}\left(\frac{e^2}{DkT}\right)^{3/2},$$

where d_w is the density and D the dielectric constant of pure water.

The leading terms in eqs (5) and (6) are Debye-Hückel terms describing long range electrostatic interactions. The parameters b and α have fixed values of 1.2 and 2.0 respectively for all 1-1 electrolytes. They are assumed to be temperature and pressure independent. The adjustable parameters $\beta_{MX}^{(0)}$, $\beta_{MX}^{(1)}$, and C_{MX}^{ϕ} account for short-range interactions between ions and for indirect forces arising from the solvent. C_{MX}^{ϕ} depends on triple ion interactions and is important only at high concentrations.

Equations (5), (6), and their temperature derivatives have been used successfully [8] to describe the activity and thermal properties of aqueous sodium chloride solutions over a wide range of temperature. Use of the appropriate pressure derivatives of these equations to describe volumetric properties will make it easy to combine the volumetric results with those for the activity and thermal properties to form an equation of state for sodium chloride solutions.

The total volume of the solution, V, is given by the pressure derivative of the total Gibbs energy of the solution,

$$V = \left(\frac{\partial G}{\partial P}\right)_T . \tag{7}$$

The definition of the excess Gibbs energy is

$$G = n_1\bar{G}_1^\circ + n_2\bar{G}_2^\circ + G^{EX} \tag{8}$$

so that the pressure derivative becomes

$$V = n_1\bar{V}_1^\circ + n_2\bar{V}_2^\circ + \left(\frac{\partial G^{EX}}{\partial P}\right)_T . \tag{9}$$

The apparent molal volume is defined as

$$\phi_V = \frac{V - n_1\bar{V}_1^\circ}{n_2} , \tag{10}$$

so that from eq (9),

$$\phi_V = \bar{V}_2^\circ + \frac{1}{n_2}\left(\frac{\partial G^{EX}}{\partial P}\right)_T . \tag{11}$$

Here $\bar{V}_2^\circ$ is the partial molal volume of the solute at infinite dilution. Substitution of eq (4) into eq (11) yields the parametric form of the equation for the apparent molal volume,

$$\phi_V = \bar{V}_2^\circ + \nu|z_M z_X|\ A_v h(I) + 2\nu_M\nu_X\ RT[mB_{MX}^V + m^2(\nu_M z_M)\ C_{MX}^V] \tag{12}$$

with the shorthand equations

$$h(I) = \ln(1+bI^{1/2})/2b \tag{13}$$

$$B_{MX}(I) = \beta_{MX}^{(0)} + 2\beta_{MX}^{(1)}[1-(1+\alpha I^{1/2})\ e^{-\alpha I^{1/2}}]/\alpha^2 I \tag{14}$$

$$C_{MX} = C_{MX}^\phi/2|z_M z_X|^{1/2} \tag{15}$$

and

$$B_{MX}^V(I) = (\partial B_{MX}(I)/\partial P)_{T,I} \tag{16}$$

$$C_{MX}^V = (\partial C_{MX}/\partial P)_T. \tag{17}$$

Also,

$$A_v = -4RT(\partial A_\phi/\partial P)_T. \tag{18}$$

3. Review and Evaluation of Literature Data

The literature sources of volume and density data used in the fit of NaCl solution volumetric properties are listed in table 1, along with estimates of the precision of the data. These data sets have been chosen from a literature search of the references listed in Potter's bibliography [9] and other sources, on the basis of their precision and their coverage of a wide range of temperature, pressure, or molality. Estimates for the precision of the data were taken as stated by the original investigator or as one in the last decimal place of the reported data.

Data reported as a difference in the density or volume of solution versus that of water (references [10]-[14], [17], and [18]) were used in that form. The high pressure data of Chem, Emmet, and Millero [16] were reported as a difference in density between the solution at the experimental pressure and at one atmosphere, so that actual values of the density at high pressures were calculated using a fit of the one-atmosphere literature data as a baseline. The data of Gibson and Loeffler [15] were obtained experimentally as expansivities at one atmosphere and compressibilities at constant temperature. Since the data at 25°C and one atmosphere used as the reference for their measurements agreed to within their experimental error with more recent data, their data were used without correction. The literature data at high temperatures (references [4], [5], and [20]-[24]) also were used without correction.

Table 1. Literature data for NaCl volumetric properties

Reference	Temperature Range (°C)	Pressure Range (bar)	Molality Range (molal)	Estimated Precision (ppm)	Standard deviation of fit (ppm) I	II
10	0- 55	1.01	.01-1.0	1	25	32
11	50	1.01	.005-1.0	2	18	19
12	5	1.01	.05-3.5	1	53	79
13	25	1.01	.03-3.7	1	10	36
14	1.5-45	1.01	.03-3.0	3	50	54
15	25-85	1-1000	1. -5.7	10	35	60
16	0-50	1-1000	.1-2.0	30	88	90
17	15-45	1.01	.06-5.9	1	20	50
18	0-35	1.01	.01-1.5	1	20	30
19	0-20	1.01	4. -6.0	100	105	127
20	75-200	20.	.1-1.0	50		179
5	75-200	20.	.05-4.0	200		170
4	100-300	100-1000	.02-5.7	1000		477
21	200-300	saturation	.2-5.7	1000		(6675)[a]
22,23	100-175	saturation	.1-3.6	100		(775)[a]
24	100-350	98-981	.35-5.4	1000		(18,000)[a]
	overall standard deviation of fit				60 ppm	300 ppm

[a] Data from references [21]-[24] were deweighted in the final fit of the volumetric properties. They have been omitted from the calculation of the standard deviation of fit.

In the high temperature region the major data set is that of Hilbert [4]. This set was chosen over that of Zarembo and Federov [24] since it was judged to be more precise, and it is in considerably better agreement with the low temperature data in the region of overlap. This is illustrated in figure 1, where the low temperature data of Gibson and Loeffler [15] and the high temperature data of Hilbert and of Zarembo and Federov are compared. One should also note from table 1 that there is a large difference between the precision of the data below and above 85°C.

Accurate volumetric properties for pure water are also necessary, since they will enter directly into the fitting equation (sec. 4.1). The recent steam tables of Haar, Gallagher, and Kell [25] have been used because they emphasize reproduction of the volumetric properties of liquid water to within experimental accuracy. It is important that these same values for the volumetric properties of water be used in reproducing the volumetric properties of sodium chloride solutions.

Clarke and Glew [26] have recently presented a correlation of the dielectric constant of water and of Debye-Hückel parameters to 150°C at saturation pressure. Since we wish to use a single equation for the dielectric constant, valid at high pressures and to 300°C, we have retained the Bradley and Pitzer formulation [7]. Debye-Hückel slopes have been calculated using this equation and the volumetric properties of pure water given by Haar, et al. [25].

4. Calculations

4.1. Derivation of the Volumetric Fitting Equation

Equation (12) gives the dependence of the apparent molal volume of the solution on $\bar{V}_2^{\circ}$ and the pressure derivatives of $\beta_{MX}^{(0)}$, $\beta_{MX}^{(1)}$, and C_{MX}^{ϕ}. This form of the equation can be used directly to determine $\bar{V}_2^{\circ}$, B_{MX}^{V}, and C_{MX}^{V} from a least squares fit of experimental data. However, preliminary analysis of the volumetric data over the wide range of temperature considered in this study indicated that this was not the best form of the equation to use at high temperatures. $\bar{V}_2^{\circ}$ displays a complex behavior with considerable curvature at lower temperatures followed by a rapid decrease as T increases; it drops to almost -100 cm^3 mol^{-1} at 300°C, compared to a value of +18 cm^3 mol^{-1} at 25°C. $\bar{V}_2^{\circ}$ is a measure of the effect of the solute on solvent properties, so that the rapid change in $\bar{V}_2^{\circ}$ can be related to changes in the properties of pure water and to increased interaction between solute and solvent. One physical explanation for the large negative values of $\bar{V}_2^{\circ}$ is that addition of salt to pure water at high temperatures results in a "condensation" of water molecules around the solute ions. In effect, as the temperature increases, the ion-dipole interactions between solute ions and water become progressively stronger than the dipole-dipole and hydrogen bonding interactions between water molecules, causing the water molecules to collapse around the solute ions. This explanation is further supported by examination of values for the heat of solution, which become large and negative at high temperatures. Essentially these are a measure of the heat liberated when water in a rather open structure condenses around the added solute ions.

We can use this physical picture to suggest a method of rewriting eq (12). The purpose here is to avoid trying to fit the temperature dependence of $\bar{V}_2^\circ$ with a parametric equation, since this equation would necessarily be very complicated.

We begin by assuming that each mole of salt in an electrolyte solution is associated with a certain number, Y, of water molecules. If n_1 is the number of moles of water in the solution, and n_2 is the number of moles of salt, then the number of moles of water associated with solute ions is n_2Y and the number of unassociated water molecules is (n_1-n_2Y). From the definition of the apparent molal volume, the total volume of the solution is

$$V = n_1\bar{V}_1^\circ + n_2{}^\phi V. \quad (19)$$

Rewriting this equation to explicitly consider the two different classes of water molecules, one obtains

$$V = (n_1-n_2Y)\,\bar{V}_1^\circ + n_2({}^\phi V + Y\bar{V}_1^\circ).$$

The conversion to molality and a basis of 1 kg of water yields

$$V = (1000/M_w - mY)\,\bar{V}_1^\circ + m({}^\phi V + Y\bar{V}_1^\circ), \quad (20)$$

where M_w is the molecular weight of water. We also prefer to consider the apparent molal volume at the particular concentration m_1, where $m_1 = 1000/YM_w$, since this property will vary less drastically with temperature than the infinite dilution property. Thus eq (20) is rewritten as

$$\frac{V}{m} = [{}^\phi V(m_1) + Y\bar{V}_1^\circ] + (\frac{1000}{mM_w} - Y)\,\bar{V}_1^\circ + {}^\phi V(m) - {}^\phi V(m_1), \quad (21)$$

where the term $[{}^{\phi}V(m_1) + Y\bar{V}_1^{\circ}] = V(m_1)/m_1$ is the desired quantity which varies slowly with temperature, and the next term depends only on the properties of pure water.

Substitution of the parametric equations for ${}^{\phi}V$ yields

$$v = \left(\frac{m}{1000+mM_2}\right)\left\{\frac{V(m_1)}{m_1} + \left(\frac{1000}{m} - M_w Y\right) v_w + \right.$$

$$\nu|z_M z_X|\ A_v[h(I)-h(I_1)] + 2\nu_M\nu_X RT[m\ B^v_{MX}(I) - m_1\ B^v_{MX}(I_1) + \tag{22}$$

$$\left.(\nu_M z_M)(m^2-m_1^2)\ C^v_{MX}]\right\}$$

where v is the specific volume of the solution, v_w is the specific volume of pure water, M_2 is the molecular weight of the solute, I_1 is the ionic strength of the solution at m_1, and $V(m_1)$ is the total volume of the solution containing 1 kg of water at concentration m_1. The total volume of the solution varies monotonically with temperature, increasing more slowly with temperature the higher the concentration. The value of Y = 10 was chosen to yield a concentration, m_1 = 5.550825 m, conveniently at the upper concentration limit of the existing data. For aqueous sodium chloride solutions, values of the other constants in eq (22) are,

$\nu_M = \nu_X = 1$ $\qquad$ M_2 = 58.4428 gm

$z_M = z_X = 1$ $\qquad$ M_w = 18.01534 gm

$\nu = 2$ $\qquad$ R = 83.1440 cm^3 bar mol^{-1}

4.2. Temperature and Pressure Dependence of the Fitting Parameters

The fitting equation (22) gives the concentration dependence of the volumetric data at a single temperature and pressure. In preliminary isothermal, isobaric calculations, it was found that the pressure dependence of $\beta_{MX}^{(1)}$ could not be determined from the volumetric data. Therefore

$$\left(\frac{\partial \beta_{MX}^{(1)}}{\partial P}\right)_T = 0 \quad \text{and} \quad B_{MX}^{v} = \left(\frac{\partial \beta^{(0)}}{\partial P}\right)_T$$

throughout this study. This situation is not surprising, since $\beta_{MX}^{(1)}$ is important only at low molalities, where the quality of the volumetric data is likely to be poorest. Thus $\beta_{MX}^{(1)}$ will have no pressure dependence, whereas $\beta_{MX}^{(0)}$ and C_{MX}^{ϕ} will depend both on temperature and pressure in the final equation of state.

In order to fit all of the volumetric data listed in table 1 simultaneously, equations describing the temperature and pressure dependence of $V(m_1)$, B_{MX}^{v}, and C_{MX}^{v} are needed. The optimum forms for these equations are listed below:

$$V(m_1) = U_1 + U_2T + U_3T^2 + U_4T^3 + (P-P_0)[U_5 + U_6T + U_7T^2] + (P-P_0)^2\ [U_8 + U_9T] \tag{23}$$

$$\begin{aligned} B_{MX}^{v} = U_{10} + \frac{U_{11}}{(T-227)} + U_{12}T + U_{13}T^2 + \frac{U_{14}}{(680-T)} + (P-P_0)[U_{15} + \frac{U_{16}}{(T-227)} + \\ U_{17}T + U_{18}T^2 + \frac{U_{19}}{(680-T)}] + (P-P_0)^2\ [U_{20} + \frac{U_{21}}{(T-227)} + U_{22}T + \frac{U_{23}}{(680-T)}] \end{aligned} \tag{24}$$

$$2C_{MX}^{v} = U_{24} + \frac{U_{25}}{(T-227)} + U_{26}T + U_{27}T^2 + \frac{U_{28}}{(680-T)}\ . \tag{25}$$

The factor of 2 is retained in eq (25) to yield the pressure derivative of the tabulated parameter C^{ϕ}_{MX}; thus

$$(\partial C^{\phi}_{MX}/\partial P)_T = 2C^{V}_{MX}$$

Here T is the temperature in Kelvins and P is the pressure in bar, with P_0 = 1.01325 bar. The factors 1/(T-227) and 1/(680-T) are used for convenience as functions which change rapidly in the region of 0°C and 350°C respectively. Expansivities at temperatures below 25°C, derived from the volumetric fit, are fairly sensitive to the value of the low temperature function. For this reason, the value of 227 K was chosen to coincide approximately with the temperature of a thermodynamic singularity for supercooled water reported by Kanno and Angell [27]. Use of the factor 1/(T-227) yields expansivity values that are consistent with those derived directly from the closely spaced volumetric data of Chen, Chen, and Millero [18] at 1 bar. The choice of the high temperature factor has no theoretical significance.

5. Discussion

5.1. Low Temperature and Overall Fit

As a result of the large difference in precision of the data sets, a single, overall fit of the high and low temperature data cannot do justice to the quality of the low temperature data. Since we were particularly interested in deriving values for the expansivity of NaCl solutions, the inaccuracy of an overall fit in the low temperature region proved troublesome. For this reason, two different sets of the fitting parameters, U, are presented in table 2. The first set reproduces the low temperature volumetric data with a high degree of precision, and can be used to obtain values for the volume, expansivity, and compressibility of NaCl solutions to 85°C. The second set reproduces the high temperature data to within the precision level of Hilbert's data and also describes the low temperature data to within an uncertainty of ±150 ppm. It can be used to obtain volumetric properties over the entire temperature range of 0°C to 300°C when this level of precision will suffice. High temperature values for the expansivity and compressibility can be calculated from this overall fit. Values for the volume, compressibility, and expansivity at 50°C calculated from the overall fit parameters agree, within the uncertainty quoted for that fit, with the values calculated from the low temperature parameters. Thus 50°C is the temperature recommended for changing from one set of parameters to the other when properties over a wide range of temperatures are required.

Table 2. Values of fitting parameters

U	Set I Low Temperature Fit	Set II Overall Fit
1	$1.0837195 \times 10^{+3}$	$1.0249125 \times 10^{+3}$
2	$-2.4749323 \times 10^{-1}$	2.7796679×10^{-1}
3	1.2442861×10^{-3}	$-3.0203919 \times 10^{-4}$
4	0.	1.4977178×10^{-6}
5	$-7.7222249 \times 10^{-2}$	$-7.2002329 \times 10^{-2}$
6	3.2423439×10^{-4}	3.1453130×10^{-4}
7	$-5.7917599 \times 10^{-7}$	$-5.9795994 \times 10^{-7}$
8	3.3254437×10^{-6}	$-6.6596010 \times 10^{-6}$
9	0.	3.0407621×10^{-8}
10	$-2.1451068 \times 10^{-5}$	5.3699517×10^{-5}
11	2.2324909×10^{-3}	2.2020163×10^{-3}
12	$-6.4950599 \times 10^{-8}$	$-2.6538013 \times 10^{-7}$
13	$2.4503020 \times 10^{-10}$	$8.6255554 \times 10^{-10}$
14	0.	$-2.6829310 \times 10^{-2}$
15	1.0033371×10^{-7}	$-1.1173488 \times 10^{-7}$
16	$-1.2784026 \times 10^{-6}$	$-2.6249802 \times 10^{-7}$
17	$-4.6468063 \times 10^{-10}$	$3.4926500 \times 10^{-10}$
18	$5.7054131 \times 10^{-13}$	$-8.3571924 \times 10^{-13}$
19	0.	3.0669940×10^{-5}
20	0.	$1.9767979 \times 10^{-11}$
21	$1.3581172 \times 10^{-10}$	$-1.9144105 \times 10^{-10}$
22	0.	$3.1387857 \times 10^{-14}$
23	0.	$-9.6461948 \times 10^{-9}$
24	$-6.8152430 \times 10^{-6}$	2.2902837×10^{-5}
25	$-2.5382945 \times 10^{-4}$	$-4.3314252 \times 10^{-4}$
26	6.2480692×10^{-8}	$-9.0550901 \times 10^{-8}$
27	$-1.0731284 \times 10^{-10}$	$8.6926600 \times 10^{-11}$
28	0.	5.1904777×10^{-4}

5.2. Estimation of Uncertainties

The regions of validity and the estimated uncertainties for the volumetric properties calculated from both sets of parameters are summarized in table 3. In general, the volume of NaCl solutions can be reproduced up to 5.5 m, the compressibility to 5 m, and the expansivity to 4 m. However, below 25°C the molality range on all properties above 1.01 bar is limited to 2 m because of a lack of high concentration data at high pressures.

Estimates of the uncertainty in the expansivity and compressibility between 25°C and 85°C were made by comparing the values derived from the volumetric fit equations and the values tabulated by Gibson and Loeffler [15]. The agreement in values from these two sources at 25°C is shown in figures 2 and 3. At high temperatures, estimation of the precision of these properties becomes more difficult because of the wide and irregular spacing of Hilbert's measurements. However, assuming that the maximum uncertainty in the volume is ±1000 ppm over a 50 K temperature interval or a 500 bar pressure interval, the uncertainties in derived values of the expansion and compression are both about ±5%.

The compressibilities derived from the volumetric fit differ from those of Rowe and Chou [28] by as much as 10%. The values for the compressibility of pure water used by Rowe and Chou also differ by as much as 3% from those of Haar, et al. [25]; however, this difference can not account for the total discrepancy in the compressibilities of sodium chloride solutions.

Table 3. Estimated uncertainty in volumetric properties

Property	Temperature Range (°C)	Pressure Range (bar)	Concentration Range (molal)	Estimated Confidence Limits: Low Temperature Fit (I)	Estimated Confidence Limits: High Temperature (Fit (II))
Volume	0 - 25	1.01	0 - 5.5	120 ppm	150 ppm
	0 - 25	1 - 1000	0 - 2.0	120 ppm	150 ppm
	25 - 85	1 - 1000	0 - 5.5	70 ppm	150 ppm
	85 - 300	1 - 1000	0 - 5.5	-	700 ppm
Expansivity	0 - 25	1.01	0 - 4.0	1%	(not recommended)
	0 - 25	1 - 1000	0 - 2.0	1%	
	25 - 85	1 - 1000	0 - 4.0	1%	5%
	85 - 300	1 - 1000	0 - 4.0	-	5%
Compressibility	0 - 25	1 - 1000	0 - 2.0	.5%	(not recommended)
	25 - 85	1 - 1000	0 - 5.0	.5%	5%
	85 - 300	1 - 1000	0 - 5.0	-	5%

5.3. Explanation of Tables

The changes with temperature of the parameters $V(m_1)/m_1$, B^v_{MX}, and C^v_{MX} are shown in figures 4-6. Values of the apparent molal volume at infinite dilution also can be obtained from these fitting parameters and the calculated values of the specific volume; they are shown in figure 7. Values of v_w, $\bar{V}^\circ_2$, B^v_{MX}, C^v_{MX}, and the Debye-Hückel slopes are listed at ten degree intervals in the Appendix table A-1. These can be used directly in eq (22) to calculate the apparent molal volumes of sodium chloride solutions. The specific volume of a solution can be obtained through the identity

$$v = \frac{m^{\phi}V+1000v_w}{(1000+mM_2)} . \tag{26}$$

The temperature and pressure derivatives of the parameters, the Debye-Hückel slopes, and the volume of pure water are given in tables A-2 and A-3. The expansivity and compressibility of sodium chloride solutions can be calculated using these values and the following equations:

$$\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} = \frac{1}{v(1000+mM_2)}\left\{1000\left(\frac{\partial v_w}{\partial T}\right)_P + m\left(\frac{\partial \bar{V}^\circ_2}{\partial T}\right)_P + \nu|z_M z_X|A_x\, m\, h(I) + 2\nu_M\nu_X\, RT\left[m^2\left(\frac{\partial B^v_{MX}}{\partial T}\right)_{P,I} + m^3(\nu_M z_M)\left(\frac{\partial C^v_{MX}}{\partial T}\right)_P\right]\right\} \tag{27}$$

$$\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} = \frac{1}{v(1000+mM_2)}\left\{1000\left(\frac{\partial v_w}{\partial P}\right)_T + m\left(\frac{\partial \bar{V}_2^\circ}{\partial P}\right)_T + \nu|z_M z_X|A_k\, m\, h(I) + 2\nu_M\nu_X\, RT\left[m^2\left(\frac{\partial B_{MX}^v}{\partial P}\right)_{T,I} + m^3(\nu_M z_M)\left(\frac{\partial C_{MX}^v}{\partial P}\right)_T\right]\right\} \tag{28}$$

where A_x and A_k are the Debye-Hückel slopes for the expansivity and compressibility of electrolyte solutions. In tables A-1 to A-3, the low temperature fit (Parameter Set I) has been used from 0°C to 50°C. The overall fit (Parameter Set II) has been used above 50°C, accounting the discontinuity in the parameters observed in the tables at 50°C. Even though the parameters are discontinuous at 50°C, calculated values of the specific volume, expansivity, and compressibility at this temperature agree within the uncertainty limits quoted for the overall fit. For convenience, values of the specific volume, expansivity, and compressibility at rounded concentrations are given in tables A-4 to A-6.

6. Pressure Dependence of Thermodynamic Properties

6.1. Derivation of Equations

Knowledge of the volumetric properties of the solution also can be used to calculate the pressure dependence of activity and thermal properties. A review of the equations for the enthalpy and heat capacity, as given by Silvester and Pitzer [8], is presented before the pressure dependent equations are derived.

The relative enthalpy of an electrolyte solution, L, is defined as the difference between the total enthalpy of the solution and the enthalpy of the solution in its standard state,

$$L = H - \overset{\circ}{H}. \tag{29}$$

The relative enthalpy is related to the excess Gibbs energy of the solution by the equation

$$L = G^{EX} - T^2\left(\frac{\partial G^{EX}}{\partial T}\right)_{P,m} = -T^2\left(\frac{\partial G^{EX}/T}{\partial T}\right)_{P,m} \tag{30}$$

Also, the excess entropy of the solution is $S^{EX} = (L - G^{EX})/T$. The apparent molal enthalpy is defined as

$$^{\phi}L = L/n_2. \tag{31}$$

The parametric form of the equation for the apparent molal enthalpy is [8],

$$^{\phi}L = \nu|z_M z_X| A_H\ h(I) - 2\nu_M\nu_X\ RT^2 \left\{ m\left(\frac{\partial B_{MX}}{\partial T}\right)_{P,I} + m^2(\nu_M z_M)\left(\frac{\partial C_{MX}}{\partial T}\right)_P \right\} \tag{32}$$

where A_H is the Debye-Hückel enthalpy slope.

The experimental determination of the enthalpy of an electrolyte solution is made through heat of dilution or heat of solution measurements. The molar heat of dilution, $\Delta\bar{H}_D$, is the heat change per mole measured when a solution at concentration m_1 is diluted to concentration m_2, and it is related to the apparent molal enthalpies at m_2 and m_1 by

$$\Delta\bar{H}_D = {}^{\phi}L(m_2) - {}^{\phi}L(m_1). \tag{33}$$

The molar heat of solution, $\Delta\bar{H}_s$, is the heat change measured when one mole of salt is dissolved in enough water to form a solution of concentration m. It is related to the apparent molal enthalpy by

$$\Delta\bar{H}_s = \Delta\bar{H}_s^{\circ} + {}^{\phi}L, \tag{34}$$

where $\Delta\bar{H}_s^\circ$ is the heat of solution at infinite dilution.

The apparent molal heat capacity is defined as the difference between the heat capacity of the solution and the heat capacity of pure water contained in the solution, per mole of salt,

$$^{\phi}C_p = \frac{C_p - n_1\bar{C}^\circ_{p_1}}{n_2} . \qquad (35)$$

The apparent molal heat capacity is related to the apparent molal enthalpy by

$$^{\phi}C_p = \bar{C}^\circ_{p_2} + \left(\frac{\partial\,^{\phi}L}{\partial T}\right)_{P,m} \qquad (36)$$

where $\bar{C}^\circ_{p_2}$ is the partial molal heat capacity of the solute at infinite dilution. Combining eq (36) and the temperature derivative of eq (32) yields

$$^{\phi}C_p = \bar{C}^\circ_{p_2} + \nu|z_M z_X|\ A_J\ h(I) - 2\nu_M\nu_X\ RT^2\left\{m\left[\left(\frac{\partial^2 B_{MX}}{\partial T^2}\right)_{P,I} + \frac{2}{T}\left(\frac{\partial B_{MX}}{\partial T}\right)_{P,I}\right] + m^2(\nu_M z_M)\left[\left(\frac{\partial^2 C_{MX}}{\partial T^2}\right)_P + \frac{2}{T}\left(\frac{\partial C_{MX}}{\partial T}\right)_P\right]\right\} \qquad (37)$$

where A_J is the Debye-Hückel slope for the heat capacity.

Finally, the pressure dependence of the activity and thermal properties can be found by taking the derivatives of eqs (5), (6), (32), and (37) with respect to pressure. Equations are given below for the change in these properties in going from an initial pressure P_1 to a final pressure P_2.

$$\phi(P_2) - \phi(P_1) = -|z_M z_X|[A_\phi(P_2)-A_\phi(P_1)] \frac{I^{1/2}}{1+bI^{1/2}} +$$

$$\frac{2\nu_M\nu_X}{\nu} \int_{P_1}^{P_2} \left\{ m \left(\frac{\partial\beta^{(0)}_{MX}}{\partial P}\right)_T + m \left(\frac{\partial\beta^{(1)}_{MX}}{\partial P}\right)_T e^{-\alpha I^{1/2}} + m^2(\nu_M\nu_X)^{1/2} \left(\frac{\partial C^{\phi}_{MX}}{\partial P}\right)_T \right\} dP \qquad (38)$$

$$\ln\gamma_{\pm}(P_2) - \ln\gamma_{\pm}(P_1) = -|z_M z_X|[A_\phi(P_2)-A_\phi(P_1)] \left(\frac{I^{1/2}}{1+I^{1/2}} + \frac{2}{b} \ln(1+bI^{1/2})\right) +$$

$$\frac{2\nu_M\nu_X}{\nu} \int_{P_1}^{P_2} \left\{ 2m\left(\frac{\partial\beta^{(0)}_{MX}}{\partial P}\right)_T + \frac{2m}{\alpha^2 I} \left(\frac{\partial\beta^{(1)}_{MX}}{\partial P}\right)_T [1-(1+\alpha I^{1/2} - \frac{\alpha^2 I}{2}) e^{-\alpha I^{1/2}}] + \right. \qquad (39)$$

$$\left. \frac{3}{2} m^2(\nu_M\nu_X)^{1/2} \left(\frac{\partial C^{\phi}_{MX}}{\partial P}\right)_T \right\} dP$$

$$^{\phi}L(P_2) - {}^{\phi}L(P_1) = \nu|z_M z_X|[A_H(P_2)-A_H(P_1)]h(I) -$$

$$2\nu_M\nu_X\ RT^2 \int_{P_1}^{P_2} \left\{ m\left(\frac{\partial B^{v}_{MX}}{\partial T}\right)_{P,I} + m^2(\nu_M z_M)\left(\frac{\partial C^{v}_{MX}}{\partial T}\right)_P \right\} dP \qquad (40)$$

$$^{\phi}C_p(P_2) - {}^{\phi}C_p(P_1) = \nu|z_M z_X|[A_J(P_2)-A_J(P_1)]h(I) + \int_{P_1}^{P_2} T\left(\frac{\partial^2\bar{V}^{\circ}_2}{\partial T^2}\right)_P dP -$$

$$2\nu_M\nu_X\ RT^2 \int_{P_1}^{P_2} \left\{ m \left[\left(\frac{\partial^2 B^{v}_{MX}}{\partial T^2}\right)_{P,I} + \frac{2}{T} \left(\frac{\partial B^{v}_{MX}}{\partial T}\right)_{P,I}\right] + \right. \qquad (41)$$

$$\left. m^2(\nu_M z_M) \left[\left(\frac{\partial^2 C^{v}_{MX}}{\partial T^2}\right)_P + \frac{2}{T} \left(\frac{\partial C^{v}_{MX}}{\partial T}\right)_P\right] \right\} dP$$

To determine the pressure dependence of heat of solution data, the change in $\Delta\bar{H}_s^\circ$ with pressure is also needed. The heat of solution at infinite dilution is related to the partial molal enthalpy of the solute at infinite dilution, $\bar{H}_2^\circ$, and the molal enthalpy of the solid salt, $\bar{H}(s)$, by the equation

$$\Delta\bar{H}_s^\circ = \bar{H}_2^\circ - \bar{H}(s). \qquad (42)$$

The change with pressure is

$$\left(\frac{\partial \Delta\bar{H}_s^\circ}{\partial P}\right)_T = \bar{V}_2^\circ - T\left(\frac{\partial \bar{V}_2^\circ}{\partial T}\right)_P - \left\{\bar{V}(s) + T\left(\frac{\partial \bar{V}(s)}{\partial T}\right)_P\right\}, \qquad (43)$$

where $\bar{V}_2^\circ$ is the partial molal volume of the solute at infinite dilution and $\bar{V}(s)$ is the molal volume of the pure salt in the solid phase. Since the temperature and pressure dependences of the volume of the solid are small, the integral of the term in brackets can be approximated as

$$\int_{P_1}^{P_2} \left\{\bar{V}(s) + T\left(\frac{\bar{V}(s)}{T}\right)_P\right\} dP \approx \bar{V}(s)_{298K}\,(P_2-P_1). \qquad (44)$$

This approximation is accurate to .04J mol^{-1} bar^{-1}, so it is sufficient in comparison to the larger uncertainty in the pressure dependence of $\bar{H}_2^\circ$. The pressure dependence of $\Delta\bar{H}_s^\circ$ now reduces to,

$$\Delta\bar{H}_s^\circ(P_2) - \Delta\bar{H}_s^\circ(P_1) = \int_{P_1}^{P_2} \left\{\bar{V}_2^\circ - T\left(\frac{\partial \bar{V}_2^\circ}{\partial T}\right)_P\right\} dP - \bar{V}(s)(P_2-P_1), \qquad (45)$$

with $\bar{V}(s) = 26.994$ cm^3 mol^{-1} at 25°C [29].

6.2. Estimation of Uncertainties

The error accumulated in a pressure correction is difficult to determine because of the multiple operations needed to obtain the final value. The pressure dependence of an osmotic or activity coefficient is known most accurately, since only terms describing the specific volume of the NaCl solution as a function of pressure are required for the calculation. The estimated error in the pressure correction for these properties is 10%, resulting in a maximum uncertainty of $\pm.009$ in adjusting the value of an osmotic coefficient at 300°C from saturation pressure to 1000 bar. For comparison, the experimental uncertainty in a measured osmotic coefficient at 300°C and saturation pressure is $\pm.005$.

The uncertainty in a pressure correction for enthalpy and heat capacity data will be larger, since these corrections require information on the first and second temperature derivatives of the volume of the NaCl solution. The minimum uncertainty in a pressure correction can be estimated by comparing values obtained from the low temperature fit and the overall fit in the region of overlap. Minimum uncertainties are ± 20 J mol^{-1} for the apparent molal enthalpy and ± 2 J K^{-1} mol^{-1} for the apparent molal heat capacity. At high temperatures, recent enthalpy and heat capacity data reported at elevated pressures can be used to assess the uncertainty in the pressure corrections. Busey [30] lists enthalpy of dilution data at 66 to 105 bar and 400 bar. Comparison of the high pressure data with the low pressure data adjusted to 400 bar shows that the corrected values are in agreement approximately within the scatter of the measured enthalpies. The heat capacity data of Tanner and Lamb [30] at 1 bar and of Likke and Bromley [32] at saturation pressures can be corrected to 177 bar for comparison with the data of Smith-Magowan and Wood [33] at that pressure. Again, the differences are comparable to the observed scatter in the measured heat capacities. An estimated error of 20% for the pressure correction gives an uncertainty in the correction to 200 bar of the same magnitude as the experimental uncertainty in the measured enthalpies and heat capacities. Thus this value has been chosen as the estimated uncertainty in the pressure corrections for these quantities. The percent uncertainty should remain fairly constant for corrections over larger pressure intervals, so that the absolute error in a pressure adjustment from saturation pressure to 1000 bar will be four or five times as large as the uncertainty in a correction from saturation pressure to 200 bar. Table 4 lists the estimated percent uncertainties in the pressure adjustments, along with the range of experimental uncertainties for existing activity, enthalpy, and heat capacity data.

6.3. Explanation of Tables

The pressure dependences of the osmotic and activity coefficients, the heat of solution, and the apparent molal enthalpy and heat capacity are given in the Appendix tables A-7 through A-11. Values are listed as the change in a thermodynamic property due to a pressure change from the saturation pressure of pure water to 200, 400, 600, or 1000 bar. Thus the table values can be added directly to experimental data along the saturation curve to obtain the corresponding high pressure values. Of course other pressure adjustments, for example from 200 bar to 400 bar, can be obtained by taking the difference of two table values. Above 25°C, pressure corrections calculated from the low temperature fit and the overall fit are in good agreement compared to the 10% or 20% estimated uncertainty. Thus for simplicity, all values listed in tables A-7 to A-11 were calculated using only the overall fit (Parameter Set II).

Table 4. Pressure dependence of thermodynamic properties

Property	Pressure Dependence	Uncertainty Estimates: Correction to 200 bar		Uncertainty Estimates: Experimental Data[c]
ϕ	10%	.002	(300°C)	.005
$\ln\gamma_{\pm}$	10%	.002	(50°C)	.002
$\Delta\bar{H}_D$	20%[a]	20 J mol^{-1}	(25°C)	4 J mol^{-1}
		30 J mol^{-1}	(100°C)	20 J mol^{-1}[d]
		250 J mol^{-1}	(200°C)	65 J mol^{-1}[d]
		1,500 J mol^{-1}	(300°C)	1,000 J mol^{-1}[d]
$\Delta\bar{H}_s$	20%[a]	20 J mol^{-1}	(25°C)	16 J mol^{-1}
		60 J mol^{-1}	(100°C)	100 J mol^{-1}
		400 J mol^{-1}	(200°C)	160 J mol^{-1}
ϕ_{C_p}	20%[b]	2 J K^{-1} mol^{-1}	(25°C)	1 J K^{-1} mol^{-1}
		4 J K^{-1} mol^{-1}	(200°C)	4 J K^{-1} mol^{-1}
		50 J K^{-1} mol^{-1}	(300°C)	

[a] Uncertainty is 20% or 20 J mol^{-1}, whichever is greater.

[b] Uncertainty is 20% or 2 J K^{-1} mol^{-1}, whichever is greater.

[c] Values from table III of reference [34], unless otherwise noted.

[d] Values from a least squares fit of data from reference [30].

7. Conclusion

Accurate calculation of the volumetric properties of sodium chloride solutions over a wide range of concentration, temperature, and pressure is possible with the equations presented above. Recent improvements in the data base, including the high temperature data of Hilbert [4] and high concentration data from this laboratory at 20 bar [5], have been used. Special attention has been paid to the behavior of the expansivity and compressibility values derived from the volumetric fit. Because the temperature and pressure dependences of the volumetric fit have been carefully controlled, calculation of the pressure dependence of activity, enthalpy, and heat capacity data is possible. The change in these properties due to a pressure change from saturation pressure to 200 bar generally can be calculated with an uncertainty comparable to the experimental uncertainty in direct measurements of these quantities. This important property of the volumetric fit will allow it to be combined with a temperature dependent tabulation of activity, enthalpy, and heat capacity data to form a complete equation of state for sodium chloride solutions.

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Appendix

The tables included in the Appendix can be divided into three groups. Tables A-1 through A-3 give the fitting parameters, Debye-Hückel slopes, and properties of pure water needed to calculate the apparent molal volume, expansivity, or compressibility of a sodium chloride solution at any concentration. Tables A-4 through A-6 give values of these three properties calculated at rounded concentrations. Tables A-7 through A-11 list the pressure dependence of the activity and osmotic coefficients, heat of solution, apparent molal enthalpy, and apparent molal heat capacity.

Table A-1. Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B^V_{MX}	$2C^V_{MX}$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	1	1.000171	1.504E+00	1.327E+01	2.746E-05	-3.26E-06
10	1	1.000259	1.643E+00	1.506E+01	1.956E-05	-2.25E-06
20	1	1.001771	1.793E+00	1.625E+01	1.431E-05	-1.56E-06
25	1	1.002947	1.875E+00	1.668E+01	1.234E-05	-1.29E-06
30	1	1.004365	1.962E+00	1.702E+01	1.069E-05	-1.07E-06
40	1	1.007851	2.153E+00	1.750E+01	8.152E-06	-7.19E-07
50	1	1.012115	2.372E+00	1.774E+01	6.366E-06	-4.71E-07
50	1	1.012115	2.372E+00	1.782E+01	5.733E-06	-3.32E-07
60	1	1.017087	2.622E+00	1.791E+01	4.415E-06	-2.00E-07
70	1	1.022724	2.909E+00	1.781E+01	3.513E-06	-1.22E-07
80	1	1.028999	3.238E+00	1.754E+01	2.925E-06	-7.97E-08
90	1	1.035897	3.615E+00	1.710E+01	2.577E-06	-6.02E-08
100	1	1.043414	4.050E+00	1.649E+01	2.408E-06	-5.46E-08
110	1	1.051530	4.550E+00	1.571E+01	2.368E-06	-5.59E-08
120	2	1.060271	5.127E+00	1.475E+01	2.412E-06	-5.87E-08
130	3	1.069653	5.795E+00	1.360E+01	2.498E-06	-5.87E-08
140	4	1.079700	6.572E+00	1.226E+01	2.587E-06	-5.23E-08
150	5	1.090444	7.477E+00	1.070E+01	2.637E-06	-3.65E-08
160	6	1.101926	8.536E+00	8.911E+00	2.606E-06	-8.63E-09
170	8	1.114196	9.779E+00	6.863E+00	2.448E-06	3.36E-08
180	10	1.127316	1.125E+01	4.523E+00	2.112E-06	9.24E-08
190	13	1.141359	1.299E+01	1.849E+00	1.542E-06	1.70E-07
200	16	1.156413	1.506E+01	-1.215E+00	6.729E-07	2.69E-07
210	19	1.172584	1.756E+01	-4.742E+00	-5.691E-07	3.91E-07
220	23	1.190001	2.058E+01	-8.826E+00	-2.272E-06	5.38E-07
230	28	1.208817	2.425E+01	-1.360E+01	-4.538E-06	7.15E-07
240	33	1.229223	2.878E+01	-1.923E+01	-7.494E-06	9.24E-07
250	40	1.251452	3.440E+01	-2.596E+01	-1.129E-05	1.17E-06
260	47	1.275795	4.149E+01	-3.414E+01	-1.612E-05	1.45E-06
270	55	1.302623	5.052E+01	-4.426E+01	-2.221E-05	1.79E-06
280	64	1.332417	6.224E+01	-5.704E+01	-2.987E-05	2.18E-06
290	74	1.365815	7.775E+01	-7.360E+01	-3.951E-05	2.63E-06
300	86	1.403691	9.873E+01	-9.568E+01	-5.167E-05	3.17E-06

Table A-1 (con't). Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B_{MX}^V	$2C_{MX}^V$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	200	.990367	1.462E+00	1.452E+01	2.525E-05	-3.26E-06
10	200	.991052	1.587E+00	1.607E+01	1.801E-05	-2.25E-06
20	200	.992910	1.724E+00	1.711E+01	1.317E-05	-1.56E-06
25	200	.994196	1.799E+00	1.749E+01	1.133E-05	-1.29E-06
30	200	.995690	1.879E+00	1.780E+01	9.792E-06	-1.07E-06
40	200	.999244	2.055E+00	1.824E+01	7.404E-06	-7.19E-07
50	200	1.003486	2.255E+00	1.846E+01	5.717E-06	-4.71E-07
50	200	1.003486	2.255E+00	1.852E+01	5.187E-06	-3.32E-07
60	200	1.008358	2.484E+00	1.858E+01	4.005E-06	-2.00E-07
70	200	1.013825	2.745E+00	1.848E+01	3.224E-06	-1.22E-07
80	200	1.019865	3.043E+00	1.822E+01	2.746E-06	-7.97E-08
90	200	1.026463	3.383E+00	1.780E+01	2.502E-06	-6.02E-08
100	200	1.033614	3.772E+00	1.723E+01	2.434E-06	-5.46E-08
110	200	1.041317	4.217E+00	1.650E+01	2.497E-06	-5.59E-08
120	200	1.049580	4.728E+00	1.561E+01	2.651E-06	-5.87E-08
130	200	1.058416	5.315E+00	1.456E+01	2.859E-06	-5.87E-08
140	200	1.067844	5.991E+00	1.333E+01	3.086E-06	-5.23E-08
150	200	1.077890	6.773E+00	1.192E+01	3.296E-06	-3.65E-08
160	200	1.088587	7.679E+00	1.031E+01	3.453E-06	-8.63E-09
170	200	1.099978	8.734E+00	8.473E+00	3.517E-06	3.36E-08
180	200	1.112113	9.967E+00	6.399E+00	3.444E-06	9.24E-08
190	200	1.125054	1.141E+01	4.052E+00	3.185E-06	1.70E-07
200	200	1.138874	1.312E+01	1.396E+00	2.684E-06	2.69E-07
210	200	1.153664	1.515E+01	-1.618E+00	1.872E-06	3.91E-07
220	200	1.169532	1.758E+01	-5.055E+00	6.700E-07	5.38E-07
230	200	1.186608	2.051E+01	-9.001E+00	-1.019E-06	7.15E-07
240	200	1.205052	2.407E+01	-1.357E+01	-3.314E-06	9.24E-07
250	200	1.225063	2.846E+01	-1.892E+01	-6.363E-06	1.17E-06
260	200	1.246892	3.392E+01	-2.529E+01	-1.036E-05	1.45E-06
270	200	1.270855	4.083E+01	-3.300E+01	-1.553E-05	1.79E-06
280	200	1.297370	4.974E+01	-4.257E+01	-2.221E-05	2.18E-06
290	200	1.326994	6.147E+01	-5.477E+01	-3.082E-05	2.63E-06
300	200	1.360501	7.737E+01	-7.091E+01	-4.195E-05	3.17E-06

Table A-1 (con't). Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B_{MX}^v	$2C_{MX}^v$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	400	.981139	1.419E+00	1.566E+01	2.325E-05	-3.26E-06
10	400	.982347	1.532E+00	1.698E+01	1.665E-05	-2.25E-06
20	400	.984517	1.657E+00	1.789E+01	1.217E-05	-1.56E-06
25	400	.985902	1.726E+00	1.822E+01	1.047E-05	-1.29E-06
30	400	.987468	1.799E+00	1.850E+01	9.028E-06	-1.07E-06
40	400	.991092	1.961E+00	1.889E+01	6.779E-06	-7.19E-07
50	400	.995322	2.145E+00	1.910E+01	5.177E-06	-4.71E-07
50	400	.995322	2.145E+00	1.914E+01	4.708E-06	-3.32E-07
60	400	1.000115	2.355E+00	1.919E+01	3.642E-06	-2.00E-07
70	400	1.005441	2.593E+00	1.909E+01	2.953E-06	-1.22E-07
80	400	1.011282	2.864E+00	1.884E+01	2.552E-06	-7.97E-08
90	400	1.017626	3.171E+00	1.845E+01	2.371E-06	-6.02E-08
100	400	1.024466	3.520E+00	1.792E+01	2.359E-06	-5.46E-08
110	400	1.031802	3.918E+00	1.725E+01	2.474E-06	-5.59E-08
120	400	1.039636	4.370E+00	1.644E+01	2.681E-06	-5.87E-08
130	400	1.047976	4.886E+00	1.548E+01	2.947E-06	-5.87E-08
140	400	1.056837	5.476E+00	1.437E+01	3.242E-06	-5.23E-08
150	400	1.066235	6.151E+00	1.310E+01	3.538E-06	-3.65E-08
160	400	1.076195	6.927E+00	1.165E+01	3.803E-06	-8.63E-09
170	400	1.086745	7.819E+00	1.002E+01	4.007E-06	3.36E-08
180	400	1.097921	8.848E+00	8.196E+00	4.115E-06	9.24E-08
190	400	1.109765	1.004E+01	6.150E+00	4.087E-06	1.70E-07
200	400	1.122329	1.143E+01	3.863E+00	3.880E-06	2.69E-07
210	400	1.135670	1.305E+01	1.307E+00	3.441E-06	3.91E-07
220	400	1.149859	1.494E+01	-1.555E+00	2.708E-06	5.38E-07
230	400	1.164978	1.718E+01	-4.765E+00	1.608E-06	7.15E-07
240	400	1.181124	1.984E+01	-8.380E+00	4.760E-08	9.24E-07
250	400	1.198411	2.302E+01	-1.247E+01	-2.086E-06	1.17E-06
260	400	1.216977	2.686E+01	-1.714E+01	-4.937E-06	1.45E-06
270	400	1.236985	3.153E+01	-2.251E+01	-8.692E-06	1.79E-06
280	400	1.258636	3.728E+01	-2.876E+01	-1.359E-05	2.18E-06
290	400	1.282174	4.446E+01	-3.613E+01	-1.997E-05	2.63E-06
300	400	1.307904	5.358E+01	-4.501E+01	-2.826E-05	3.17E-06

Table A-1 (con't). Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B_{MX}^v	$2C_{MX}^v$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	600	.972473	1.379E+00	1.668E+01	2.150E-05	-3.26E-06
10	600	.974133	1.479E+00	1.780E+01	1.548E-05	-2.25E-06
20	600	.976579	1.594E+00	1.858E+01	1.135E-05	-1.56E-06
25	600	.978056	1.657E+00	1.888E+01	9.756E-06	-1.29E-06
30	600	.979687	1.724E+00	1.912E+01	8.406E-06	-1.07E-06
40	600	.983379	1.873E+00	1.947E+01	6.279E-06	-7.19E-07
50	600	.987606	2.043E+00	1.967E+01	4.750E-06	-4.71E-07
50	600	.987606	2.043E+00	1.970E+01	4.300E-06	-3.32E-07
60	600	.992334	2.235E+00	1.974E+01	3.328E-06	-2.00E-07
70	600	.997542	2.453E+00	1.964E+01	2.704E-06	-1.22E-07
80	600	1.003214	2.699E+00	1.941E+01	2.344E-06	-7.97E-08
90	600	1.009341	2.978E+00	1.906E+01	2.186E-06	-6.02E-08
100	600	1.015916	3.293E+00	1.858E+01	2.183E-06	-5.46E-08
110	600	1.022937	3.649E+00	1.798E+01	2.297E-06	-5.59E-08
120	600	1.030405	4.052E+00	1.725E+01	2.496E-06	-5.87E-08
130	600	1.038326	4.509E+00	1.639E+01	2.753E-06	-5.87E-08
140	600	1.046708	5.027E+00	1.540E+01	3.043E-06	-5.23E-08
150	600	1.055564	5.615E+00	1.426E+01	3.341E-06	-3.65E-08
160	600	1.064911	6.284E+00	1.298E+01	3.623E-06	-8.63E-09
170	600	1.074770	7.046E+00	1.155E+01	3.863E-06	3.36E-08
180	600	1.085167	7.917E+00	9.942E+00	4.036E-06	9.24E-08
190	600	1.096132	8.913E+00	8.158E+00	4.110E-06	1.70E-07
200	600	1.107700	1.006E+01	6.180E+00	4.053E-06	2.69E-07
210	600	1.119913	1.137E+01	3.989E+00	3.825E-06	3.91E-07
220	600	1.132819	1.289E+01	1.564E+00	3.379E-06	5.38E-07
230	600	1.146474	1.465E+01	-1.117E+00	2.660E-06	7.15E-07
240	600	1.160941	1.669E+01	-4.085E+00	1.600E-06	9.24E-07
250	600	1.176293	1.908E+01	-7.373E+00	1.148E-07	1.17E-06
260	600	1.192615	2.189E+01	-1.102E+01	-1.904E-06	1.45E-06
270	600	1.210005	2.521E+01	-1.508E+01	-4.592E-06	1.79E-06
280	600	1.228578	2.917E+01	-1.961E+01	-8.131E-06	2.18E-06
290	600	1.248465	3.391E+01	-2.468E+01	-1.276E-05	2.63E-06
300	600	1.269825	3.967E+01	-3.037E+01	-1.881E-05	3.17E-06

Table A-1 (con't). Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B^v_{MX}	$2C^v_{MX}$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	800	.964329	1.341E+00	1.759E+01	1.997E-05	-3.26E-06
10	800	.966373	1.431E+00	1.853E+01	1.450E-05	-2.25E-06
20	800	.969059	1.535E+00	1.920E+01	1.069E-05	-1.56E-06
25	800	.970616	1.593E+00	1.946E+01	9.198E-06	-1.29E-06
30	800	.972306	1.655E+00	1.967E+01	7.926E-06	-1.07E-06
40	800	.976061	1.792E+00	1.999E+01	5.905E-06	-7.19E-07
50	800	.980288	1.948E+00	2.016E+01	4.436E-06	-4.71E-07
50	800	.980288	1.948E+00	2.020E+01	3.964E-06	-3.32E-07
60	800	.984963	2.125E+00	2.024E+01	3.062E-06	-2.00E-07
70	800	.990070	2.324E+00	2.015E+01	2.474E-06	-1.22E-07
80	800	.995597	2.549E+00	1.995E+01	2.121E-06	-7.97E-08
90	800	1.001536	2.803E+00	1.964E+01	1.946E-06	-6.02E-08
100	800	1.007881	3.088E+00	1.922E+01	1.905E-06	-5.46E-08
110	800	1.014629	3.409E+00	1.870E+01	1.965E-06	-5.59E-08
120	800	1.021781	3.770E+00	1.806E+01	2.098E-06	-5.87E-08
130	800	1.029340	4.176E+00	1.731E+01	2.279E-06	-5.87E-08
140	800	1.037312	4.634E+00	1.645E+01	2.488E-06	-5.23E-08
150	800	1.045706	5.150E+00	1.546E+01	2.705E-06	-3.65E-08
160	800	1.054535	5.732E+00	1.435E+01	2.910E-06	-8.63E-09
170	800	1.063813	6.390E+00	1.311E+01	3.084E-06	3.36E-08
180	800	1.073560	7.134E+00	1.173E+01	3.206E-06	9.24E-08
190	800	1.083798	7.976E+00	1.020E+01	3.254E-06	1.70E-07
200	800	1.094554	8.932E+00	8.510E+00	3.203E-06	2.69E-07
210	800	1.105857	1.002E+01	6.647E+00	3.023E-06	3.91E-07
220	800	1.117742	1.125E+01	4.599E+00	2.682E-06	5.38E-07
230	800	1.130248	1.267E+01	2.351E+00	2.139E-06	7.15E-07
240	800	1.143419	1.428E+01	-1.131E-01	1.345E-06	9.24E-07
250	800	1.157306	1.613E+01	-2.812E+00	2.390E-07	1.17E-06
260	800	1.171965	1.827E+01	-5.763E+00	-1.255E-06	1.45E-06
270	800	1.187460	2.073E+01	-8.986E+00	-3.235E-06	1.79E-06
280	800	1.203864	2.359E+01	-1.250E+01	-5.829E-06	2.18E-06
290	800	1.221257	2.692E+01	-1.632E+01	-9.211E-06	2.63E-06
300	800	1.239733	3.082E+01	-2.044E+01	-1.361E-05	3.17E-06

Table A-1 (con't). Parameters for calculation of the apparent molal volume

T	P	v_w	D-H Slope	$\bar{V}_2^\circ$	B_{MX}^v	$2C_{MX}^v$
°C	bar	$\frac{cm^3}{g}$	$\frac{cm^3}{mol}$	$\frac{cm^3}{mol}$	$\frac{g}{mol\ bar}$	$\frac{g^2}{mol^2\ bar}$
0	1000	.956683	1.307E+00	1.840E+01	1.869E-05	-3.26E-06
10	1000	.959040	1.386E+00	1.917E+01	1.372E-05	-2.25E-06
20	1000	.961926	1.480E+00	1.974E+01	1.019E-05	-1.56E-06
25	1000	.963552	1.533E+00	1.997E+01	8.792E-06	-1.29E-06
30	1000	.965293	1.590E+00	2.016E+01	7.590E-06	-1.07E-06
40	1000	.969102	1.716E+00	2.044E+01	5.658E-06	-7.19E-07
50	1000	.973330	1.860E+00	2.061E+01	4.235E-06	-4.71E-07
50	1000	.973330	1.860E+00	2.065E+01	3.698E-06	-3.32E-07
60	1000	.977959	2.022E+00	2.069E+01	2.845E-06	-2.00E-07
70	1000	.982978	2.206E+00	2.063E+01	2.265E-06	-1.22E-07
80	1000	.988378	2.412E+00	2.047E+01	1.884E-06	-7.97E-08
90	1000	.994152	2.643E+00	2.021E+01	1.651E-06	-6.02E-08
100	1000	1.000295	2.902E+00	1.987E+01	1.526E-06	-5.46E-08
110	1000	1.006805	3.192E+00	1.943E+01	1.480E-06	-5.59E-08
120	1000	1.013681	3.517E+00	1.890E+01	1.486E-06	-5.87E-08
130	1000	1.020925	3.881E+00	1.827E+01	1.525E-06	-5.87E-08
140	1000	1.028541	4.288E+00	1.755E+01	1.579E-06	-5.23E-08
150	1000	1.036535	4.743E+00	1.674E+01	1.631E-06	-3.65E-08
160	1000	1.044917	5.254E+00	1.581E+01	1.667E-06	-8.63E-09
170	1000	1.053699	5.827E+00	1.478E+01	1.670E-06	3.36E-08
180	1000	1.062894	6.469E+00	1.364E+01	1.627E-06	9.24E-08
190	1000	1.072519	7.190E+00	1.237E+01	1.519E-06	1.70E-07
200	1000	1.082595	7.999E+00	1.097E+01	1.329E-06	2.69E-07
210	1000	1.093143	8.910E+00	9.435E+00	1.036E-06	3.91E-07
220	1000	1.104190	9.935E+00	7.751E+00	6.171E-07	5.38E-07
230	1000	1.115764	1.109E+01	5.910E+00	4.313E-08	7.15E-07
240	1000	1.127898	1.239E+01	3.899E+00	-7.197E-07	9.24E-07
250	1000	1.140627	1.387E+01	1.709E+00	-1.713E-06	1.17E-06
260	1000	1.153991	1.553E+01	-6.714E-01	-2.991E-06	1.45E-06
270	1000	1.168034	1.743E+01	-3.251E+00	-4.620E-06	1.79E-06
280	1000	1.182806	1.957E+01	-6.037E+00	-6.688E-06	2.18E-06
290	1000	1.198361	2.202E+01	-9.027E+00	-9.315E-06	2.63E-06
300	1000	1.214758	2.482E+01	-1.221E+01	-1.266E-05	3.17E-06

Table A-2. Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}_2^{\circ}}{\partial T}\right)_P$	$\left(\frac{\partial B^V_{MX}}{\partial T}\right)_P$	$\left(\frac{\partial 2C^V_{MX}}{\partial T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g}{mol\ bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	1	-8.022E-05	1.37E-02	2.21E-01	-9.79E-07	1.23E-07
10	1	8.747E-05	1.43E-02	1.44E-01	-6.34E-07	8.22E-08
20	1	2.094E-04	1.59E-02	9.57E-02	-4.31E-07	5.76E-08
25	1	2.602E-04	1.68E-02	7.72E-02	-3.60E-07	4.86E-08
30	1	3.064E-04	1.79E-02	6.13E-02	-3.01E-07	4.12E-08
40	1	3.890E-04	2.05E-02	3.49E-02	-2.12E-07	2.95E-08
50	1	4.627E-04	2.34E-02	1.32E-02	-1.48E-07	2.06E-08
50	1	4.627E-04	2.34E-02	1.85E-02	-1.57E-07	1.66E-08
60	1	5.310E-04	2.68E-02	-5.92E-04	-1.09E-07	1.01E-08
70	1	5.959E-04	3.07E-02	-1.85E-02	-7.31E-08	5.79E-09
80	1	6.588E-04	3.52E-02	-3.57E-02	-4.57E-08	2.92E-09
90	1	7.207E-04	4.04E-02	-5.27E-02	-2.49E-08	1.12E-09
100	1	7.826E-04	4.66E-02	-6.98E-02	-9.69E-09	1.13E-10
110	1	8.452E-04	5.37E-02	-8.72E-02	8.51E-10	-2.85E-10
120	2	9.093E-04	6.22E-02	-1.05E-01	7.09E-09	-2.02E-10
130	3	9.758E-04	7.22E-02	-1.25E-01	9.23E-09	2.69E-10
140	4	1.045E-03	8.40E-02	-1.45E-01	7.29E-09	1.07E-09
150	5	1.119E-03	9.82E-02	-1.68E-01	1.11E-09	2.14E-09
160	6	1.198E-03	1.15E-01	-1.93E-01	-9.56E-09	3.46E-09
170	8	1.283E-03	1.36E-01	-2.20E-01	-2.52E-08	5.02E-09
180	10	1.376E-03	1.61E-01	-2.52E-01	-4.63E-08	6.79E-09
190	13	1.479E-03	1.92E-01	-2.89E-01	-7.38E-08	8.77E-09
200	16	1.593E-03	2.31E-01	-3.33E-01	-1.09E-07	1.10E-08
210	19	1.720E-03	2.79E-01	-3.86E-01	-1.52E-07	1.34E-08
220	23	1.865E-03	3.40E-01	-4.51E-01	-2.05E-07	1.62E-08
230	28	2.030E-03	4.19E-01	-5.32E-01	-2.71E-07	1.92E-08
240	33	2.222E-03	5.22E-01	-6.37E-01	-3.52E-07	2.26E-08
250	40	2.447E-03	6.57E-01	-7.73E-01	-4.51E-07	2.64E-08
260	47	2.714E-03	8.40E-01	-9.57E-01	-5.74E-07	3.08E-08
270	55	3.037E-03	1.09E+00	-1.21E+00	-7.26E-07	3.59E-08
280	64	3.436E-03	1.44E+00	-1.57E+00	-9.17E-07	4.19E-08
290	74	3.939E-03	1.95E+00	-2.09E+00	-1.16E-06	4.92E-08
300	86	4.594E-03	2.72E+00	-2.88E+00	-1.47E-06	5.82E-08

Table A-2 (con't). Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial T}\right)_P$	$\left(\frac{\partial B_{MX}^V}{\partial T}\right)_P$	$\left(\frac{\partial 2C_{MX}^V}{\partial T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g}{mol\ bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	200	-2.807E-06	1.21E-02	1.89E-01	-8.93E-07	1.23E-07
10	200	1.326E-04	1.30E-02	1.26E-01	-5.83E-07	8.22E-08
20	200	2.350E-04	1.45E-02	8.47E-02	-4.00E-07	5.76E-08
25	200	2.785E-04	1.55E-02	6.89E-02	-3.35E-07	4.86E-08
30	200	3.185E-04	1.65E-02	5.52E-02	-2.82E-07	4.12E-08
40	200	3.909E-04	1.88E-02	3.22E-02	-2.00E-07	2.95E-08
50	200	4.564E-04	2.14E-02	1.30E-02	-1.40E-07	2.06E-08
50	200	4.564E-04	2.14E-02	1.57E-02	-1.42E-07	1.66E-08
60	200	5.175E-04	2.44E-02	-1.88E-03	-9.63E-08	1.01E-08
70	200	5.756E-04	2.79E-02	-1.83E-02	-6.16E-08	5.79E-09
80	200	6.320E-04	3.18E-02	-3.40E-02	-3.51E-08	2.92E-09
90	200	6.875E-04	3.63E-02	-4.95E-02	-1.48E-08	1.12E-09
100	200	7.426E-04	4.16E-02	-6.50E-02	5.06E-10	1.13E-10
110	200	7.982E-04	4.76E-02	-8.07E-02	1.15E-08	-2.85E-10
120	200	8.547E-04	5.47E-02	-9.70E-02	1.87E-08	-2.02E-10
130	200	9.128E-04	6.29E-02	-1.14E-01	2.23E-08	2.69E-10
140	200	9.732E-04	7.26E-02	-1.32E-01	2.24E-08	1.07E-09
150	200	1.037E-03	8.40E-02	-1.51E-01	1.90E-08	2.14E-09
160	200	1.104E-03	9.76E-02	-1.72E-01	1.17E-08	3.46E-09
170	200	1.175E-03	1.14E-01	-1.95E-01	3.28E-10	5.02E-09
180	200	1.253E-03	1.33E-01	-2.20E-01	-1.57E-08	6.79E-09
190	200	1.337E-03	1.57E-01	-2.49E-01	-3.70E-08	8.77E-09
200	200	1.429E-03	1.86E-01	-2.83E-01	-6.45E-08	1.10E-08
210	200	1.531E-03	2.21E-01	-3.21E-01	-9.92E-08	1.34E-08
220	200	1.645E-03	2.66E-01	-3.67E-01	-1.43E-07	1.62E-08
230	200	1.773E-03	3.22E-01	-4.23E-01	-1.97E-07	1.92E-08
240	200	1.919E-03	3.94E-01	-4.93E-01	-2.64E-07	2.26E-08
250	200	2.087E-03	4.87E-01	-5.81E-01	-3.49E-07	2.64E-08
260	200	2.284E-03	6.11E-01	-6.97E-01	-4.54E-07	3.08E-08
270	200	2.516E-03	7.80E-01	-8.54E-01	-5.87E-07	3.59E-08
280	200	2.796E-03	1.01E+00	-1.07E+00	-7.56E-07	4.19E-08
290	200	3.141E-03	1.35E+00	-1.39E+00	-9.75E-07	4.92E-08
300	200	3.578E-03	1.86E+00	-1.87E+00	-1.26E-06	5.82E-08

A-2 (con'td). Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}^\circ_2}{\partial T}\right)_P$	$\left(\frac{\partial B^v_{MX}}{\partial T}\right)_P$	$\left(\frac{\partial 2C^v_{MX}}{T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g}{mol\ bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	400	6.392E-05	1.07E-02	1.60E-01	-8.11E-07	1.23E-07
10	400	1.727E-04	1.18E-02	1.09E-01	-5.36E-07	8.22E-08
20	400	2.583E-04	1.33E-02	7.44E-02	-3.72E-07	5.76E-08
25	400	2.955E-04	1.42E-02	6.11E-02	-3.13E-07	4.86E-08
30	400	3.302E-04	1.52E-02	4.94E-02	-2.65E-07	4.12E-08
40	400	3.936E-04	1.73E-02	2.95E-02	-1.89E-07	2.95E-08
50	400	4.517E-04	1.96E-02	1.26E-02	-1.34E-07	2.06E-08
50	400	4.517E-04	1.96E-02	1.32E-02	-1.29E-07	1.66E-08
60	400	5.063E-04	2.23E-02	-2.74E-03	-8.60E-08	1.01E-08
70	400	5.586E-04	2.54E-02	-1.76E-02	-5.32E-08	5.79E-09
80	400	6.094E-04	2.88E-02	-3.19E-02	-2.82E-08	2.92E-09
90	400	6.593E-04	3.27E-02	-4.59E-02	-8.88E-09	1.12E-09
100	400	7.088E-04	3.72E-02	-5.99E-02	5.80E-09	1.13E-10
110	400	7.584E-04	4.24E-02	-7.40E-02	1.66E-08	-2.85E-10
120	400	8.086E-04	4.83E-02	-8.85E-02	2.41E-08	-2.02E-10
130	400	8.598E-04	5.51E-02	-1.03E-01	2.86E-08	2.69E-10
140	400	9.126E-04	6.30E-02	-1.19E-01	3.00E-08	1.07E-09
150	400	9.675E-04	7.23E-02	-1.36E-01	2.86E-08	2.14E-09
160	400	1.025E-03	8.30E-02	-1.53E-01	2.40E-08	3.46E-09
170	400	1.086E-03	9.57E-02	-1.73E-01	1.62E-08	5.02E-09
180	400	1.150E-03	1.11E-01	-1.93E-01	4.69E-09	6.79E-09
190	400	1.219E-03	1.28E-01	-2.16E-01	-1.09E-08	8.77E-09
200	400	1.294E-03	1.50E-01	-2.42E-01	-3.14E-08	1.10E-08
210	400	1.375E-03	1.75E-01	-2.70E-01	-5.75E-08	1.34E-08
220	400	1.464E-03	2.06E-01	-3.03E-01	-9.03E-08	1.62E-08
230	400	1.561E-03	2.43E-01	-3.40E-01	-1.31E-07	1.92E-08
240	400	1.670E-03	2.90E-01	-3.84E-01	-1.83E-07	2.26E-08
250	400	1.790E-03	3.48E-01	-4.36E-01	-2.47E-07	2.64E-08
260	400	1.926E-03	4.22E-01	-4.99E-01	-3.27E-07	3.08E-08
270	400	2.079E-03	5.16E-01	-5.77E-01	-4.28E-07	3.59E-08
280	400	2.255E-03	6.40E-01	-6.76E-01	-5.57E-07	4.19E-08
290	400	2.458E-03	8.05E-01	-8.05E-01	-7.25E-07	4.92E-08
300	400	2.695E-03	1.03E+00	-9.79E-01	-9.44E-07	5.82E-08

Table A-2 (con't). Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial T}\right)_P$	$\left(\frac{\partial B^V_{MX}}{\partial T}\right)_P$	$\left(\frac{\partial 2C^V_{MX}}{\partial T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g}{mol\ bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	600	1.211E-04	9.52E-03	1.34E-01	-7.34E-07	1.23E-07
10	600	2.079E-04	1.07E-02	9.29E-02	-4.92E-07	8.22E-08
20	600	2.793E-04	1.22E-02	6.50E-02	-3.46E-07	5.76E-08
25	600	3.111E-04	1.31E-02	5.39E-02	-2.93E-07	4.86E-08
30	600	3.410E-04	1.39E-02	4.40E-02	-2.49E-07	4.12E-08
40	600	3.966E-04	1.59E-02	2.69E-02	-1.80E-07	2.95E-08
50	600	4.482E-04	1.80E-02	1.19E-02	-1.28E-07	2.06E-08
50	600	4.482E-04	1.80E-02	1.12E-02	-1.18E-07	1.66E-08
60	600	4.971E-04	2.05E-02	-3.02E-03	-7.82E-08	1.01E-08
70	600	5.442E-04	2.32E-02	-1.63E-02	-4.80E-08	5.79E-09
80	600	5.901E-04	2.62E-02	-2.91E-02	-2.50E-08	2.92E-09
90	600	6.352E-04	2.96E-02	-4.16E-02	-7.34E-09	1.12E-09
100	600	6.798E-04	3.35E-02	-5.41E-02	6.12E-09	1.13E-10
110	600	7.244E-04	3.79E-02	-6.66E-02	1.62E-08	-2.85E-10
120	600	7.693E-04	4.29E-02	-7.94E-02	2.33E-08	-2.02E-10
130	600	8.150E-04	4.86E-02	-9.25E-02	2.77E-08	2.69E-10
140	600	8.617E-04	5.51E-02	-1.06E-01	2.98E-08	1.07E-09
150	600	9.098E-04	6.27E-02	-1.21E-01	2.94E-08	2.14E-09
160	600	9.599E-04	7.13E-02	-1.36E-01	2.66E-08	3.46E-09
170	600	1.012E-03	8.14E-02	-1.52E-01	2.11E-08	5.02E-09
180	600	1.068E-03	9.30E-02	-1.69E-01	1.29E-08	6.79E-09
190	600	1.126E-03	1.07E-01	-1.88E-01	1.47E-09	8.77E-09
200	600	1.188E-03	1.22E-01	-2.08E-01	-1.36E-08	1.10E-08
210	600	1.255E-03	1.41E-01	-2.30E-01	-3.29E-08	1.34E-08
220	600	1.327E-03	1.63E-01	-2.55E-01	-5.72E-08	1.62E-08
230	600	1.405E-03	1.89E-01	-2.82E-01	-8.77E-08	1.92E-08
240	600	1.490E-03	2.21E-01	-3.12E-01	-1.26E-07	2.26E-08
250	600	1.582E-03	2.59E-01	-3.46E-01	-1.73E-07	2.64E-08
260	600	1.684E-03	3.05E-01	-3.85E-01	-2.33E-07	3.08E-08
270	600	1.796E-03	3.61E-01	-4.28E-01	-3.08E-07	3.59E-08
280	600	1.921E-03	4.32E-01	-4.78E-01	-4.04E-07	4.19E-08
290	600	2.060E-03	5.21E-01	-5.37E-01	-5.28E-07	4.92E-08
300	600	2.215E-03	6.35E-01	-6.04E-01	-6.90E-07	5.82E-08

Table A-2 (con't). Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}^\circ_2}{\partial T}\right)_P$	$\left(\frac{\partial B^v_{MX}}{\partial T}\right)_P$	$\left(\frac{\partial 2C^v_{MX}}{\partial T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g}{mol \cdot bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	800	1.689E-04	8.34E-03	1.10E-01	-6.63E-07	1.23E-07
10	800	2.381E-04	9.67E-03	7.87E-02	-4.51E-07	8.22E-08
20	800	2.978E-04	1.12E-02	5.65E-02	-3.22E-07	5.76E-08
25	800	3.249E-04	1.20E-02	4.74E-02	-2.75E-07	4.86E-08
30	800	3.508E-04	1.28E-02	3.91E-02	-2.35E-07	4.12E-08
40	800	3.995E-04	1.46E-02	2.44E-02	-1.72E-07	2.95E-08
50	800	4.454E-04	1.66E-02	1.12E-02	-1.24E-07	2.06E-08
50	800	4.454E-04	1.66E-02	9.84E-03	-1.09E-07	1.66E-08
60	800	4.893E-04	1.88E-02	-2.60E-03	-7.29E-08	1.01E-08
70	800	5.319E-04	2.12E-02	-1.43E-02	-4.59E-08	5.79E-09
80	800	5.734E-04	2.39E-02	-2.55E-02	-2.56E-08	2.92E-09
90	800	6.142E-04	2.69E-02	-3.64E-02	-1.02E-08	1.12E-09
100	800	6.547E-04	3.02E-02	-4.73E-02	1.48E-09	1.13E-10
110	800	6.950E-04	3.40E-02	-5.82E-02	1.01E-08	-2.85E-10
120	800	7.355E-04	3.83E-02	-6.92E-02	1.61E-08	-2.02E-10
130	800	7.764E-04	4.31E-02	-8.06E-02	1.99E-08	2.69E-10
140	800	8.181E-04	4.86E-02	-9.23E-02	2.16E-08	1.07E-09
150	800	8.609E-04	5.48E-02	-1.05E-01	2.14E-08	2.14E-09
160	800	9.050E-04	6.18E-02	-1.17E-01	1.93E-08	3.46E-09
170	800	9.509E-04	6.99E-02	-1.31E-01	1.52E-08	5.02E-09
180	800	9.989E-04	7.91E-02	-1.45E-01	8.89E-09	6.79E-09
190	800	1.049E-03	8.96E-02	-1.61E-01	2.66E-10	8.77E-09
200	800	1.102E-03	1.02E-01	-1.77E-01	-1.10E-08	1.10E-08
210	800	1.159E-03	1.16E-01	-1.95E-01	-2.54E-08	1.34E-08
220	800	1.219E-03	1.32E-01	-2.15E-01	-4.35E-08	1.62E-08
230	800	1.283E-03	1.51E-01	-2.35E-01	-6.60E-08	1.92E-08
240	800	1.352E-03	1.73E-01	-2.58E-01	-9.39E-08	2.26E-08
250	800	1.426E-03	1.99E-01	-2.82E-01	-1.29E-07	2.64E-08
260	800	1.507E-03	2.29E-01	-3.08E-01	-1.72E-07	3.08E-08
270	800	1.594E-03	2.65E-01	-3.37E-01	-2.26E-07	3.59E-08
280	800	1.688E-03	3.08E-01	-3.66E-01	-2.95E-07	4.19E-08
290	800	1.792E-03	3.60E-01	-3.97E-01	-3.85E-07	4.92E-08
300	800	1.905E-03	4.23E-01	-4.28E-01	-5.02E-07	5.82E-08

Table A-2 (con't). Parameters for calculation of the expansivity

T	P	$\left(\frac{\partial v_w}{\partial T}\right)_P$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial T}\right)_P$	$\left(\frac{\partial B^V_{MX}}{\partial T}\right)_P$	$\left(\frac{\partial 2C^V_{MX}}{\partial T}\right)_P$
(°C)	(bar)	$\frac{cm^3}{gK}$	$\frac{cm^3}{mol\ K}$	$\frac{cm^3}{mol\ K}$	$\frac{g.}{mol\ bar\ K}$	$\frac{g^2}{mol^2\ bar\ K}$
0	1000	2.072E-04	7.18E-03	8.92E-02	-5.96E-07	1.23E-07
10	1000	2.631E-04	8.66E-03	6.62E-02	-4.14E-07	8.22E-08
20	1000	3.134E-04	1.02E-02	4.89E-02	-3.01E-07	5.76E-08
25	1000	3.368E-04	1.10E-02	4.16E-02	-2.59E-07	4.86E-08
30	1000	3.593E-04	1.18E-02	3.48E-02	-2.23E-07	4.12E-08
40	1000	4.022E-04	1.35E-02	2.22E-02	-1.66E-07	2.95E-08
50	1000	4.431E-04	1.53E-02	1.05E-02	-1.20E-07	2.06E-08
50	1000	4.431E-04	1.53E-02	9.21E-03	-1.02E-07	1.66E-08
60	1000	4.826E-04	1.73E-02	-1.38E-03	-7.02E-08	1.01E-08
70	1000	5.211E-04	1.94E-02	-1.13E-02	-4.70E-08	5.79E-09
80	1000	5.588E-04	2.18E-02	-2.08E-02	-2.99E-08	2.92E-09
90	1000	5.959E-04	2.45E-02	-3.01E-02	-1.73E-08	1.12E-09
100	1000	6.327E-04	2.74E-02	-3.93E-02	-8.14E-09	1.13E-10
110	1000	6.693E-04	3.07E-02	-4.84E-02	-1.66E-09	-2.85E-10
120	1000	7.059E-04	3.43E-02	-5.77E-02	2.58E-09	-2.02E-10
130	1000	7.429E-04	3.84E-02	-6.71E-02	4.92E-09	2.69E-10
140	1000	7.804E-04	4.31E-02	-7.69E-02	5.57E-09	1.07E-09
150	1000	8.187E-04	4.82E-02	-8.70E-02	4.66E-09	2.14E-09
160	1000	8.580E-04	5.40E-02	-9.76E-02	2.22E-09	3.46E-09
170	1000	8.986E-04	6.06E-02	-1.09E-01	-1.73E-09	5.02E-09
180	1000	9.407E-04	6.80E-02	-1.21E-01	-7.29E-09	6.79E-09
190	1000	9.847E-04	7.63E-02	-1.33E-01	-1.46E-08	8.77E-09
200	1000	1.031E-03	8.58E-02	-1.46E-01	-2.38E-08	1.10E-08
210	1000	1.079E-03	9.65E-02	-1.61E-01	-3.52E-08	1.34E-08
220	1000	1.131E-03	1.09E-01	-1.76E-01	-4.91E-08	1.62E-08
230	1000	1.185E-03	1.23E-01	-1.92E-01	-6.62E-08	1.92E-08
240	1000	1.242E-03	1.38E-01	-2.10E-01	-8.70E-08	2.26E-08
250	1000	1.304E-03	1.57E-01	-2.28E-01	-1.13E-07	2.64E-08
260	1000	1.370E-03	1.77E-01	-2.48E-01	-1.44E-07	3.08E-08
270	1000	1.440E-03	2.01E-01	-2.68E-01	-1.83E-07	3.59E-08
280	1000	1.515E-03	2.29E-01	-2.89E-01	-2.32E-07	4.19E-08
290	1000	1.597E-03	2.61E-01	-3.09E-01	-2.95E-07	4.92E-08
300	1000	1.684E-03	2.99E-01	-3.28E-01	-3.78E-07	5.82E-08

Table A-3. Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}_2^{\circ}}{\partial P}\right)_T$	$\left(\frac{\partial B_{MX}^{V}}{\partial P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	1	-5.101E-05	-2.01E-04	6.63E-03	-1.17E-08
10	1	-4.777E-05	-2.81E-04	5.34E-03	-8.27E-09
20	1	-4.593E-05	-3.51E-04	4.58E-03	-6.18E-09
25	1	-4.535E-05	-3.88E-04	4.34E-03	-5.46E-09
30	1	-4.496E-05	-4.25E-04	4.15E-03	-4.89E-09
40	1	-4.462E-05	-5.08E-04	3.93E-03	-4.07E-09
50	1	-4.477E-05	-6.04E-04	3.87E-03	-3.54E-09
50	1	-4.477E-05	-6.04E-04	3.70E-03	-2.92E-09
60	1	-4.533E-05	-7.18E-04	3.59E-03	-2.18E-09
70	1	-4.627E-05	-8.55E-04	3.56E-03	-1.50E-09
80	1	-4.757E-05	-1.02E-03	3.60E-03	-8.65E-10
90	1	-4.921E-05	-1.22E-03	3.71E-03	-2.44E-10
100	1	-5.122E-05	-1.47E-03	3.91E-03	3.82E-10
110	1	-5.361E-05	-1.77E-03	4.19E-03	1.03E-09
120	2	-5.641E-05	-2.14E-03	4.58E-03	1.74E-09
130	3	-5.966E-05	-2.60E-03	5.08E-03	2.52E-09
140	4	-6.343E-05	-3.17E-03	5.73E-03	3.41E-09
150	5	-6.777E-05	-3.88E-03	6.54E-03	4.44E-09
160	6	-7.279E-05	-4.78E-03	7.58E-03	5.66E-09
170	8	-7.860E-05	-5.93E-03	8.89E-03	7.09E-09
180	10	-8.535E-05	-7.38E-03	1.06E-02	8.79E-09
190	13	-9.320E-05	-9.25E-03	1.27E-02	1.08E-08
200	16	-1.024E-04	-1.17E-02	1.55E-02	1.33E-08
210	19	-1.133E-04	-1.49E-02	1.91E-02	1.62E-08
220	23	-1.262E-04	-1.91E-02	2.39E-02	1.97E-08
230	28	-1.418E-04	-2.47E-02	3.04E-02	2.38E-08
240	33	-1.607E-04	-3.23E-02	3.92E-02	2.89E-08
250	40	-1.839E-04	-4.27E-02	5.13E-02	3.49E-08
260	47	-2.130E-04	-5.72E-02	6.84E-02	4.22E-08
270	55	-2.499E-04	-7.78E-02	9.27E-02	5.10E-08
280	64	-2.980E-04	-1.08E-01	1.28E-01	6.17E-08
290	74	-3.622E-04	-1.52E-01	1.81E-01	7.49E-08
300	86	-4.507E-04	-2.18E-01	2.61E-01	9.12E-08

Table A-3 (con't). Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial P}\right)_T$	$\left(\frac{\partial B_{MX}^V}{\partial P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	200	-4.764E-05	-2.15E-04	5.98E-03	-1.06E-08
10	200	-4.484E-05	-2.81E-04	4.8[illegible]E-03	-7.30E-09
20	200	-4.320E-05	-3.42E-04	4.10E-03	-5.37E-09
25	200	-4.267E-05	-3.75E-04	3.87E-03	-4.70E-09
30	200	-4.230E-05	-4.08E-04	3.69E-03	-4.18E-09
40	200	-4.195E-05	-4.82E-04	3.48E-03	-3.44E-09
50	200	-4.204E-05	-5.69E-04	3.40E-03	-2.98E-09
50	200	-4.204E-05	-5.69E-04	3.29E-03	-2.57E-09
60	200	-4.248E-05	-6.71E-04	3.20E-03	-1.94E-09
70	200	-4.325E-05	-7.92E-04	3.18E-03	-1.40E-09
80	200	-4.433E-05	-9.37E-04	3.24E-03	-9.35E-10
90	200	-4.571E-05	-1.11E-03	3.37E-03	-5.16E-10
100	200	-4.740E-05	-1.33E-03	3.57E-03	-1.22E-10
110	200	-4.939E-05	-1.58E-03	3.86E-03	2.69E-10
120	200	-5.173E-05	-1.90E-03	4.23E-03	6.81E-10
130	200	-5.443E-05	-2.28E-03	4.70E-03	1.14E-09
140	200	-5.754E-05	-2.76E-03	5.29E-03	1.67E-09
150	200	-6.110E-05	-3.35E-03	6.01E-03	2.30E-09
160	200	-6.517E-05	-4.08E-03	6.90E-03	3.08E-09
170	200	-6.984E-05	-4.99E-03	7.98E-03	4.04E-09
180	200	-7.520E-05	-6.14E-03	9.32E-03	5.23E-09
190	200	-8.137E-05	-7.59E-03	1.10E-02	6.71E-09
200	200	-8.851E-05	-9.46E-03	1.31E-02	8.54E-09
210	200	-9.681E-05	-1.19E-02	1.57E-02	1.08E-08
220	200	-1.065E-04	-1.50E-02	1.91E-02	1.36E-08
230	200	-1.180E-04	-1.91E-02	2.36E-02	1.71E-08
240	200	-1.317E-04	-2.46E-02	2.95E-02	2.13E-08
250	200	-1.482E-04	-3.21E-02	3.76E-02	2.66E-08
260	200	-1.684E-04	-4.24E-02	4.88E-02	3.31E-08
270	200	-1.935E-04	-5.69E-02	6.46E-02	4.11E-08
280	200	-2.253E-04	-7.79E-02	8.78E-02	5.10E-08
290	200	-2.665E-04	-1.09E-01	1.23E-01	6.34E-08
300	200	-3.217E-04	-1.57E-01	1.77E-01	7.91E-08

Table A-3 (con't). Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial P}\right)_T$	$\left(\frac{\partial B_{MX}^V}{P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	400	-4.469E-05	-2.11E-04	5.39E-03	-9.38E-09
10	400	-4.226E-05	-2.70E-04	4.31E-03	-6.34E-09
20	400	-4.079E-05	-3.26E-04	3.67E-03	-4.54E-09
25	400	-4.031E-05	-3.55E-04	3.45E-03	-3.94E-09
30	400	-3.997E-05	-3.86E-04	3.29E-03	-3.47E-09
40	400	-3.962E-05	-4.53E-04	3.08E-03	-2.81E-09
50	400	-3.965E-05	-5.31E-04	3.01E-03	-2.42E-09
50	400	-3.965E-05	-5.31E-04	2.94E-03	-2.22E-09
60	400	-4.001E-05	-6.22E-04	2.87E-03	-1.69E-09
70	400	-4.065E-05	-7.30E-04	2.88E-03	-1.30E-09
80	400	-4.157E-05	-8.58E-04	2.97E-03	-1.01E-09
90	400	-4.274E-05	-1.01E-03	3.12E-03	-7.89E-10
100	400	-4.417E-05	-1.20E-03	3.36E-03	-6.28E-10
110	400	-4.586E-05	-1.42E-03	3.67E-03	-5.02E-10
120	400	-4.784E-05	-1.68E-03	4.06E-03	-3.88E-10
130	400	-5.011E-05	-2.01E-03	4.54E-03	-2.65E-10
140	400	-5.270E-05	-2.40E-03	5.12E-03	-1.08E-10
150	400	-5.565E-05	-2.88E-03	5.81E-03	1.11E-10
160	400	-5.899E-05	-3.47E-03	6.64E-03	4.24E-10
170	400	-6.278E-05	-4.19E-03	7.61E-03	8.66E-10
180	400	-6.708E-05	-5.09E-03	8.77E-03	1.48E-09
190	400	-7.195E-05	-6.20E-03	1.01E-02	2.31E-09
200	400	-7.750E-05	-7.60E-03	1.18E-02	3.42E-09
210	400	-8.383E-05	-9.35E-03	1.38E-02	4.88E-09
220	400	-9.108E-05	-1.16E-02	1.62E-02	6.77E-09
230	400	-9.944E-05	-1.44E-02	1.93E-02	9.20E-09
240	400	-1.091E-04	-1.81E-02	2.31E-02	1.23E-08
250	400	-1.204E-04	-2.29E-02	2.80E-02	1.62E-08
260	400	-1.336E-04	-2.93E-02	3.44E-02	2.11E-08
270	400	-1.493E-04	-3.78E-02	4.29E-02	2.74E-08
280	400	-1.681E-04	-4.94E-02	5.44E-02	3.52E-08
290	400	-1.907E-04	-6.56E-02	7.05E-02	4.52E-08
300	400	-2.185E-04	-8.86E-02	9.35E-02	5.78E-08

Table A-3 (con't). Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}^\circ_2}{\partial P}\right)_T$	$\left(\frac{\partial B^V_{MX}}{\partial P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	600	-4.200E-05	-1.97E-04	4.83E-03	-8.20E-09
10	600	-3.991E-05	-2.53E-04	3.86E-03	-5.37E-09
20	600	-3.862E-05	-3.06E-04	3.27E-03	-3.72E-09
25	600	-3.819E-05	-3.33E-04	3.07E-03	-3.17E-09
30	600	-3.787E-05	-3.62E-04	2.92E-03	-2.75E-09
40	600	-3.755E-05	-4.23E-04	2.73E-03	-2.18E-09
50	600	-3.755E-05	-4.94E-04	2.66E-03	-1.85E-09
50	600	-3.755E-05	-4.94E-04	2.65E-03	-1.86E-09
60	600	-3.784E-05	-5.76E-04	2.61E-03	-1.45E-09
70	600	-3.838E-05	-6.72E-04	2.65E-03	-1.20E-09
80	600	-3.916E-05	-7.85E-04	2.77E-03	-1.08E-09
90	600	-4.017E-05	-9.19E-04	2.97E-03	-1.06E-09
100	600	-4.140E-05	-1.08E-03	3.24E-03	-1.13E-09
110	600	-4.286E-05	-1.27E-03	3.59E-03	-1.27E-09
120	600	-4.456E-05	-1.50E-03	4.03E-03	-1.46E-09
130	600	-4.650E-05	-1.77E-03	4.55E-03	-1.67E-09
140	600	-4.871E-05	-2.10E-03	5.17E-03	-1.88E-09
150	600	-5.120E-05	-2.49E-03	5.88E-03	-2.08E-09
160	600	-5.401E-05	-2.97E-03	6.71E-03	-2.23E-09
170	600	-5.716E-05	-3.55E-03	7.67E-03	-2.31E-09
180	600	-6.070E-05	-4.26E-03	8.77E-03	-2.27E-09
190	600	-6.468E-05	-5.12E-03	1.00E-02	-2.08E-09
200	600	-6.915E-05	-6.18E-03	1.15E-02	-1.69E-09
210	600	-7.418E-05	-7.49E-03	1.32E-02	-1.04E-09
220	600	-7.986E-05	-9.12E-03	1.52E-02	-6.61E-11
230	600	-8.628E-05	-1.11E-02	1.75E-02	1.33E-09
240	600	-9.358E-05	-1.37E-02	2.03E-02	3.24E-09
250	600	-1.019E-04	-1.69E-02	2.36E-02	5.81E-09
260	600	-1.114E-04	-2.10E-02	2.77E-02	9.21E-09
270	600	-1.224E-04	-2.63E-02	3.28E-02	1.36E-08
280	600	-1.351E-04	-3.32E-02	3.91E-02	1.94E-08
290	600	-1.498E-04	-4.22E-02	4.73E-02	2.69E-08
300	600	-1.671E-04	-5.43E-02	5.80E-02	3.66E-08

Table A-3 (con't). Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}^\circ_2}{\partial P}\right)_T$	$\left(\frac{\partial B^V_{MX}}{\partial P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	800	-3.946E-05	-1.80E-04	4.30E-03	-7.02E-09
10	800	-3.772E-05	-2.34E-04	3.43E-03	-4.40E-09
20	800	-3.661E-05	-2.85E-04	2.90E-03	-2.90E-09
25	800	-3.624E-05	-3.10E-04	2.72E-03	-2.41E-09
30	800	-3.596E-05	-3.37E-04	2.59E-03	-2.04E-09
40	800	-3.567E-05	-3.94E-04	2.42E-03	-1.55E-09
50	800	-3.566E-05	-4.58E-04	2.35E-03	-1.29E-09
50	800	-3.566E-05	-4.58E-04	2.39E-03	-1.50E-09
60	800	-3.591E-05	-5.32E-04	2.38E-03	-1.21E-09
70	800	-3.637E-05	-6.17E-04	2.47E-03	-1.10E-09
80	800	-3.705E-05	-7.18E-04	2.63E-03	-1.15E-09
90	800	-3.793E-05	-8.36E-04	2.88E-03	-1.34E-09
100	800	-3.900E-05	-9.75E-04	3.21E-03	-1.64E-09
110	800	-4.028E-05	-1.14E-03	3.62E-03	-2.04E-09
120	800	-4.175E-05	-1.33E-03	4.11E-03	-2.53E-09
130	800	-4.343E-05	-1.57E-03	4.70E-03	-3.07E-09
140	800	-4.534E-05	-1.84E-03	5.37E-03	-3.66E-09
150	800	-4.748E-05	-2.17E-03	6.15E-03	-4.27E-09
160	800	-4.988E-05	-2.56E-03	7.04E-03	-4.89E-09
170	800	-5.255E-05	-3.03E-03	8.05E-03	-5.48E-09
180	800	-5.554E-05	-3.60E-03	9.18E-03	-6.02E-09
190	800	-5.886E-05	-4.28E-03	1.05E-02	-6.48E-09
200	800	-6.256E-05	-5.10E-03	1.19E-02	-6.81E-09
210	800	-6.668E-05	-6.10E-03	1.35E-02	-6.97E-09
220	800	-7.128E-05	-7.31E-03	1.53E-02	-6.91E-09
230	800	-7.642E-05	-8.79E-03	1.74E-02	-6.54E-09
240	800	-8.217E-05	-1.06E-02	1.97E-02	-5.80E-09
250	800	-8.863E-05	-1.28E-02	2.24E-02	-4.57E-09
260	800	-9.590E-05	-1.56E-02	2.54E-02	-2.72E-09
270	800	-1.041E-04	-1.91E-02	2.90E-02	-6.86E-11
280	800	-1.134E-04	-2.34E-02	3.31E-02	3.61E-09
290	800	-1.240E-04	-2.89E-02	3.79E-02	8.62E-09
300	800	-1.360E-04	-3.59E-02	4.37E-02	1.54E-08

Table A-3 (con't). Parameters for calculation of the compressibility

T	P	$\left(\frac{\partial v_w}{\partial P}\right)_T$	D-H Slope	$\left(\frac{\partial \bar{V}_2^\circ}{\partial P}\right)_T$	$\left(\frac{\partial B_{MX}^V}{\partial P}\right)_T$
°C	bar	$\frac{cm^3}{g\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{cm^3}{mol\ bar}$	$\frac{g}{mol\ bar^2}$
0	1000	-3.701E-05	-1.63E-04	3.78E-03	-5.85E-09
10	1000	-3.563E-05	-2.15E-04	3.02E-03	-3.43E-09
20	1000	-3.473E-05	-2.64E-04	2.56E-03	-2.08E-09
25	1000	-3.442E-05	-2.88E-04	2.40E-03	-1.65E-09
30	1000	-3.419E-05	-3.13E-04	2.28E-03	-1.33E-09
40	1000	-3.394E-05	-3.65E-04	2.14E-03	-9.22E-10
50	1000	-3.394E-05	-4.24E-04	2.07E-03	-7.22E-10
50	1000	-3.394E-05	-4.24E-04	2.16E-03	-1.15E-09
60	1000	-3.416E-05	-4.91E-04	2.20E-03	-9.62E-10
70	1000	-3.457E-05	-5.68E-04	2.33E-03	-9.95E-10
80	1000	-3.517E-05	-6.57E-04	2.54E-03	-1.22E-09
90	1000	-3.594E-05	-7.62E-04	2.84E-03	-1.61E-09
100	1000	-3.689E-05	-8.84E-04	3.23E-03	-2.15E-09
110	1000	-3.801E-05	-1.03E-03	3.71E-03	-2.81E-09
120	1000	-3.931E-05	-1.19E-03	4.28E-03	-3.59E-09
130	1000	-4.078E-05	-1.39E-03	4.95E-03	-4.47E-09
140	1000	-4.245E-05	-1.63E-03	5.71E-03	-5.44E-09
150	1000	-4.431E-05	-1.90E-03	6.59E-03	-6.47E-09
160	1000	-4.639E-05	-2.23E-03	7.57E-03	-7.55E-09
170	1000	-4.870E-05	-2.61E-03	8.67E-03	-8.66E-09
180	1000	-5.125E-05	-3.07E-03	9.90E-03	-9.77E-09
190	1000	-5.408E-05	-3.61E-03	1.13E-02	-1.09E-08
200	1000	-5.721E-05	-4.26E-03	1.28E-02	-1.19E-08
210	1000	-6.066E-05	-5.03E-03	1.45E-02	-1.29E-08
220	1000	-6.448E-05	-5.95E-03	1.63E-02	-1.37E-08
230	1000	-6.871E-05	-7.06E-03	1.83E-02	-1.44E-08
240	1000	-7.340E-05	-8.39E-03	2.06E-02	-1.48E-08
250	1000	-7.859E-05	-1.00E-02	2.31E-02	-1.50E-08
260	1000	-8.437E-05	-1.19E-02	2.58E-02	-1.46E-08
270	1000	-9.080E-05	-1.43E-02	2.88E-02	-1.38E-08
280	1000	-9.797E-05	-1.72E-02	3.22E-02	-1.22E-08
290	1000	-1.060E-04	-2.07E-02	3.58E-02	-9.65E-09
300	1000	-1.150E-04	-2.51E-02	3.98E-02	-5.85E-09

Table A-4. Specific volumes of aqueous sodium chloride solutions ($cm^3\ g^{-1}$)

TEMP (°C)	PRESS (BAR)	MOLALITY .1000	.2500	.5000	.7500	1.0000	2.0000	3.0000	4.0000	5.0000
0	1	.995732	.989259	.978889	.968991	.959525	.925426	.896292	.870996	.848646
10	1	.995998	.989781	.979804	.970256	.961101	.927905	.899262	.874201	.851958
20	1	.997620	.991564	.981833	.972505	.963544	.930909	.902565	.877643	.855469
25	1	.998834	.992832	.983185	.973932	.965038	.932590	.904339	.879457	.857301
30	1	1.000279	.994319	.984735	.975539	.966694	.934382	.906194	.881334	.859185
40	1	1.003796	.997883	.988374	.979243	.970455	.938287	.910145	.885276	.863108
50	1	1.008064	1.002161	.992668	.983551	.974772	.942603	.914411	.889473	.867241
50	1	1.0081	1.0022	.9927	.9836	.9748	.9427	.9145	.8895	.8673
60	1	1.0130	1.0071	.9976	.9885	.9797	.9474	.9191	.8940	.8716
70	1	1.0186	1.0127	1.0031	.9939	.9851	.9526	.9240	.8987	.8762
80	1	1.0249	1.0188	1.0092	.9999	.9909	.9581	.9293	.9037	.8809
90	1	1.0317	1.0256	1.0157	1.0063	.9972	.9640	.9348	.9089	.8858
100	1	1.0391	1.0329	1.0228	1.0133	1.0040	.9703	.9406	.9144	.8910
110	1	1.0471	1.0407	1.0305	1.0207	1.0113	.9769	.9468	.9201	.8964
120	2	1.0557	1.0491	1.0386	1.0286	1.0190	.9839	.9532	.9261	.9020
130	3	1.0649	1.0582	1.0474	1.0371	1.0272	.9912	.9599	.9323	.9078
140	4	1.0748	1.0678	1.0567	1.0461	1.0359	.9990	.9670	.9388	.9139
150	5	1.0854	1.0781	1.0666	1.0556	1.0452	1.0072	.9744	.9456	.9202
160	6	1.0966	1.0891	1.0771	1.0658	1.0550	1.0159	.9821	.9527	.9267
170	8	1.1087	1.1008	1.0884	1.0766	1.0654	1.0250	.9903	.9601	.9335
180	10	1.1215	1.1133	1.1003	1.0881	1.0765	1.0347	.9989	.9678	.9406
190	13	1.1353	1.1266	1.1131	1.1004	1.0883	1.0449	1.0079	.9759	.9479
200	16	1.1500	1.1409	1.1268	1.1134	1.1008	1.0558	1.0175	.9844	.9556
210	19	1.1658	1.1562	1.1413	1.1274	1.1142	1.0673	1.0276	.9933	.9635
220	23	1.1828	1.1727	1.1570	1.1424	1.1286	1.0796	1.0382	1.0027	.9718
230	28	1.2011	1.1904	1.1738	1.1584	1.1440	1.0927	1.0496	1.0125	.9804
240	33	1.2209	1.2095	1.1920	1.1757	1.1605	1.1068	1.0616	1.0229	.9893
250	40	1.2425	1.2303	1.2116	1.1944	1.1783	1.1218	1.0744	1.0338	.9986
260	47	1.2661	1.2529	1.2330	1.2146	1.1976	1.1379	1.0881	1.0454	1.0082
270	55	1.2920	1.2777	1.2562	1.2366	1.2184	1.1552	1.1027	1.0575	1.0182
280	64	1.3206	1.3050	1.2817	1.2606	1.2411	1.1739	1.1182	1.0704	1.0286
290	74	1.3526	1.3353	1.3097	1.2868	1.2657	1.1938	1.1347	1.0839	1.0394
300	86	1.3886	1.3691	1.3407	1.3155	1.2926	1.2151	1.1520	1.0979	1.0504

Table A-4 (con't). Specific volumes of aqueous sodium chloride solutions ($cm^3\ g^{-1}$)

TEMP (°C)	PRESS (BAR)	MOLALITY .1000	.2500	.5000	.7500	1.0000	2.0000	3.0000	4.0000	5.0000
0	200	.986107	.979894	.969937	.960426	.951324	.918469			
10	200	.986943	.980946	.971317	.962097	.953251	.921123			
20	200	.988895	.983034	.973613	.964577	.955893	.924219			
25	200	.990212	.984397	.975047	.966075	.957446	.925922	.898408	.874105	.852393
30	200	.991729	.985950	.976653	.967728	.959139	.927724	.900255	.875964	.854257
40	200	.995310	.989570	.980336	.971464	.962921	.931614	.904167	.879856	.858128
50	200	.999554	.993820	.984597	.975734	.967196	.935872	.908366	.883982	.862192
50	200	.9996	.9938	.9846	.9758	.9672	.9359	.9084	.8840	.8622
60	200	1.0044	.9987	.9894	.9805	.9720	.9405	.9129	.8884	.8664
70	200	1.0098	1.0041	.9947	.9858	.9772	.9455	.9177	.8929	.8708
80	200	1.0158	1.0100	1.0006	.9915	.9828	.9508	.9227	.8977	.8754
90	200	1.0224	1.0164	1.0068	.9977	.9888	.9565	.9280	.9027	.8802
100	200	1.0294	1.0233	1.0136	1.0043	.9953	.9624	.9335	.9080	.8852
110	200	1.0370	1.0308	1.0209	1.0113	1.0022	.9687	.9394	.9134	.8903
120	200	1.0452	1.0388	1.0286	1.0188	1.0095	.9753	.9455	.9191	.8957
130	200	1.0539	1.0473	1.0368	1.0268	1.0172	.9823	.9518	.9250	.9013
140	200	1.0631	1.0563	1.0455	1.0353	1.0254	.9896	.9585	.9312	.9071
150	200	1.0730	1.0660	1.0548	1.0442	1.0341	.9973	.9655	.9376	.9131
160	200	1.0835	1.0762	1.0647	1.0537	1.0432	1.0054	.9728	.9443	.9194
170	200	1.0947	1.0871	1.0751	1.0637	1.0529	1.0139	.9804	.9513	.9259
180	200	1.1066	1.0987	1.0862	1.0744	1.0632	1.0229	.9885	.9586	.9326
190	200	1.1192	1.1110	1.0980	1.0857	1.0741	1.0324	.9969	.9663	.9397
200	200	1.1327	1.1241	1.1105	1.0978	1.0857	1.0425	1.0058	.9743	.9470
210	200	1.1472	1.1381	1.1239	1.1106	1.0980	1.0531	1.0152	.9827	.9547
220	200	1.1627	1.1531	1.1383	1.1243	1.1112	1.0645	1.0251	.9915	.9626
230	200	1.1794	1.1693	1.1536	1.1390	1.1253	1.0766	1.0357	1.0008	.9709
240	200	1.1973	1.1867	1.1702	1.1548	1.1404	1.0896	1.0470	1.0107	.9796
250	200	1.2168	1.2055	1.1880	1.1719	1.1567	1.1035	1.0590	1.0211	.9887
260	200	1.2380	1.2259	1.2074	1.1904	1.1744	1.1185	1.0719	1.0322	.9981
270	200	1.2613	1.2483	1.2286	1.2105	1.1936	1.1348	1.0858	1.0441	1.0081
280	200	1.2869	1.2729	1.2517	1.2325	1.2146	1.1524	1.1008	1.0567	1.0185
290	200	1.3154	1.3001	1.2773	1.2566	1.2375	1.1716	1.1170	1.0702	1.0295
300	200	1.3476	1.3307	1.3057	1.2833	1.2628	1.1925	1.1345	1.0846	1.0410

Table A-4 (con't). Specific volumes of aqueous sodium chloride solutions ($cm^3\ g^{-1}$)

TEMP (°C)	PRESS (BAR)	MOLALITY .1000	.2500	.5000	.7500	1.0000	2.0000	3.0000	4.0000	5.0000
0	400	.977044	.971070	.961490	.952335	.943568	.911854			
10	400	.978376	.972581	.963271	.954353	.945792	.914647			
20	400	.980625	.974942	.965806	.957038	.948608	.917820			
25	400	.982037	.976394	.967316	.958601	.950215	.919544	.892715	.868956	.847668
30	400	.983622	.978008	.968974	.960297	.951944	.921355	.894554	.870797	.849512
40	400	.987267	.981686	.972702	.964068	.955750	.925234	.898430	.874641	.853332
50	400	.991498	.985919	.976942	.968310	.959992	.929443	.902569	.878700	.857327
50	400	.9915	.9859	.9770	.9683	.9600	.9295	.9026	.8787	.8574
60	400	.9963	.9907	.9817	.9730	.9647	.9340	.9070	.8829	.8615
70	400	1.0016	.9959	.9869	.9781	.9697	.9388	.9116	.8874	.8658
80	400	1.0074	1.0016	.9925	.9837	.9752	.9439	.9165	.8920	.8702
90	400	1.0136	1.0078	.9985	.9896	.9810	.9494	.9216	.8969	.8748
100	400	1.0204	1.0145	1.0050	.9959	.9872	.9551	.9269	.9019	.8796
110	400	1.0276	1.0216	1.0119	1.0026	.9937	.9611	.9325	.9071	.8846
120	400	1.0353	1.0291	1.0192	1.0098	1.0006	.9674	.9383	.9126	.8897
130	400	1.0436	1.0372	1.0270	1.0173	1.0080	.9740	.9443	.9182	.8951
140	400	1.0523	1.0457	1.0352	1.0252	1.0157	.9809	.9506	.9241	.9006
150	400	1.0615	1.0547	1.0439	1.0336	1.0238	.9881	.9572	.9302	.9064
160	400	1.0713	1.0643	1.0531	1.0425	1.0323	.9957	.9641	.9365	.9123
170	400	1.0816	1.0743	1.0628	1.0518	1.0413	1.0036	.9712	.9431	.9185
180	400	1.0926	1.0850	1.0730	1.0617	1.0508	1.0119	.9787	.9499	.9249
190	400	1.1042	1.0963	1.0838	1.0720	1.0608	1.0207	.9865	.9571	.9315
200	400	1.1165	1.1082	1.0953	1.0830	1.0714	1.0299	.9947	.9645	.9384
210	400	1.1296	1.1209	1.1074	1.0946	1.0826	1.0396	1.0033	.9723	.9456
220	400	1.1434	1.1344	1.1202	1.1070	1.0944	1.0498	1.0123	.9804	.9531
230	400	1.1582	1.1487	1.1339	1.1201	1.1070	1.0607	1.0218	.9889	.9608
240	400	1.1740	1.1640	1.1485	1.1340	1.1203	1.0722	1.0319	.9979	.9689
250	400	1.1908	1.1803	1.1640	1.1489	1.1346	1.0845	1.0426	1.0073	.9773
260	400	1.2089	1.1978	1.1807	1.1648	1.1499	1.0976	1.0541	1.0173	.9861
270	400	1.2284	1.2166	1.1986	1.1819	1.1663	1.1117	1.0663	1.0279	.9953
280	400	1.2494	1.2369	1.2179	1.2004	1.1840	1.1269	1.0794	1.0392	1.0050
290	400	1.2723	1.2590	1.2388	1.2204	1.2032	1.1433	1.0935	1.0512	1.0151
300	400	1.2972	1.2830	1.2616	1.2421	1.2240	1.1612	1.1089	1.0642	1.0257

Table A-4 (con't). Specific volumes of aqueous sodium chloride solutions ($cm^3\ g^{-1}$).

TEMP (°C)	PRESS (BAR)	MOLALITY .1000	.2500	.5000	.7500	1.0000	2.0000	3.0000	4.0000	5.0000
0	600	.968527	.962771	.953537	.944706	.936244	.905577			
10	600	.970289	.964678	.955661	.947019	.938718	.908479			
20	600	.972800	.967282	.958405	.949884	.941687	.911717			
25	600	.974299	.968812	.959983	.951504	.943341	.913457	.887267	.864024	.843145
30	600	.975946	.970483	.961690	.953240	.945103	.915277	.889098	.865848	.844970
40	600	.979655	.974217	.965462	.957045	.948933	.919146	.892942	.869647	.848740
50	600	.983879	.978442	.969688	.961268	.953151	.923312	.897026	.873642	.852668
50	600	.9839	.9784	.9697	.9613	.9532	.9233	.8970	.8736	.8527
60	600	.9886	.9831	.9743	.9659	.9577	.9278	.9013	.8778	.8567
70	600	.9938	.9883	.9794	.9709	.9627	.9325	.9058	.8821	.8609
80	600	.9994	.9938	.9849	.9763	.9680	.9375	.9106	.8867	.8653
90	600	1.0055	.9998	.9907	.9820	.9736	.9427	.9155	.8913	.8697
100	600	1.0119	1.0062	.9970	.9881	.9795	.9482	.9207	.8962	.8744
110	600	1.0189	1.0130	1.0036	.9945	.9858	.9540	.9260	.9013	.8792
120	600	1.0262	1.0202	1.0106	1.0013	.9925	.9600	.9316	.9065	.8841
130	600	1.0340	1.0279	1.0180	1.0085	.9994	.9663	.9374	.9119	.8893
140	600	1.0423	1.0359	1.0258	1.0161	1.0068	.9729	.9434	.9175	.8946
150	600	1.0510	1.0444	1.0340	1.0240	1.0145	.9798	.9497	.9233	.9001
160	600	1.0602	1.0534	1.0426	1.0323	1.0225	.9869	.9562	.9294	.9058
170	600	1.0699	1.0628	1.0517	1.0411	1.0310	.9944	.9630	.9356	.9117
180	600	1.0801	1.0728	1.0612	1.0503	1.0398	1.0022	.9700	.9421	.9177
190	600	1.0908	1.0832	1.0713	1.0599	1.0492	1.0104	.9773	.9488	.9241
200	600	1.1021	1.0943	1.0818	1.0701	1.0589	1.0189	.9850	.9558	.9306
210	600	1.1141	1.1059	1.0930	1.0808	1.0692	1.0279	.9929	.9630	.9374
220	600	1.1267	1.1182	1.1047	1.0920	1.0800	1.0373	1.0013	.9706	.9444
230	600	1.1401	1.1311	1.1171	1.1037	1.0914	1.0472	1.0100	.9785	.9517
240	600	1.1542	1.1448	1.1302	1.1165	1.1035	1.0576	1.0192	.9867	.9592
250	600	1.1692	1.1594	1.1441	1.1298	1.1163	1.0686	1.0289	.9954	.9671
260	600	1.1852	1.1748	1.1588	1.1439	1.1298	1.0803	1.0391	1.0044	.9753
270	600	1.2021	1.1913	1.1745	1.1589	1.1443	1.0928	1.0500	1.0140	.9838
280	600	1.2203	1.2088	1.1913	1.1750	1.1597	1.1061	1.0616	1.0241	.9927
290	600	1.2397	1.2276	1.2092	1.1922	1.1763	1.1204	1.0740	1.0349	1.0020
300	600	1.2605	1.2478	1.2285	1.2107	1.1941	1.1359	1.0875	1.0465	1.0118

Table A-4 (con't). Specific volumes of aqueous sodium chloride solutions ($cm^3\ g^{-1}$)

TEMP (°C)	PRESS (BAR)	MOLALITY .1000	.2500	.5000	.7500	1.0000	2.0000	3.0000	4.0000	5.0000
0	800	.960519	.954961	.946041	.937506	.929323	.899616			
10	800	.962645	.957201	.948451	.940061	.932000	.902598			
20	800	.965383	.960014	.951375	.943079	.935097	.905884			
25	800	.966958	.961614	.953013	.944750	.936793	.907639	.882050	.859300	.838822
30	800	.968661	.963336	.954762	.946522	.938584	.909464	.883872	.861107	.840628
40	800	.972428	.967122	.958577	.950358	.942436	.913324	.887686	.864862	.844349
50	800	.976651	.971342	.962792	.954567	.946634	.917453	.891718	.868797	.848212
50	800	.9767	.9713	.9628	.9546	.9466	.9175	.8917	.8688	.8482
60	800	.9813	.9760	.9674	.9591	.9512	.9218	.8959	.8729	.8522
70	800	.9864	.9810	.9724	.9640	.9560	.9265	.9004	.8771	.8563
80	800	.9919	.9864	.9777	.9693	.9612	.9313	.9050	.8816	.8606
90	800	.9977	.9922	.9834	.9749	.9666	.9365	.9098	.8861	.8649
100	800	1.0040	.9984	.9894	.9808	.9724	.9418	.9149	.8909	.8695
110	800	1.0107	1.0050	.9958	.9870	.9785	.9474	.9201	.8958	.8741
120	800	1.0177	1.0119	1.0025	.9935	.9849	.9532	.9255	.9009	.8789
130	800	1.0252	1.0192	1.0096	1.0004	.9916	.9593	.9311	.9061	.8839
140	800	1.0330	1.0269	1.0170	1.0076	.9986	.9657	.9369	.9115	.8890
150	800	1.0413	1.0350	1.0249	1.0152	1.0060	.9723	.9429	.9171	.8943
160	800	1.0500	1.0435	1.0330	1.0231	1.0136	.9791	.9492	.9229	.8997
170	800	1.0591	1.0524	1.0416	1.0314	1.0216	.9862	.9556	.9289	.9054
180	800	1.0687	1.0617	1.0506	1.0401	1.0300	.9937	.9623	.9351	.9112
190	800	1.0787	1.0715	1.0600	1.0492	1.0388	1.0014	.9693	.9415	.9172
200	800	1.0893	1.0818	1.0699	1.0587	1.0479	1.0094	.9765	.9481	.9234
210	800	1.1004	1.0926	1.0802	1.0686	1.0575	1.0178	.9840	.9550	.9298
220	800	1.1120	1.1039	1.0911	1.0790	1.0676	1.0266	.9919	.9621	.9365
230	800	1.1243	1.1158	1.1025	1.0900	1.0781	1.0358	1.0000	.9695	.9434
240	800	1.1371	1.1283	1.1145	1.1015	1.0892	1.0454	1.0085	.9772	.9505
250	800	1.1507	1.1415	1.1271	1.1136	1.1008	1.0555	1.0174	.9852	.9579
260	800	1.1651	1.1554	1.1404	1.1264	1.1131	1.0661	1.0267	.9935	.9655
270	800	1.1802	1.1701	1.1545	1.1399	1.1261	1.0773	1.0366	1.0023	.9735
280	800	1.1962	1.1857	1.1694	1.1541	1.1398	1.0892	1.0470	1.0115	.9817
290	800	1.2132	1.2022	1.1852	1.1693	1.1544	1.1019	1.0580	1.0212	.9904
300	800	1.2313	1.2197	1.2020	1.1855	1.1700	1.1155	1.0699	1.0315	.9994

Table A-5.

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	-.058	-.026	.024	.069	.110	.237	.313	.355
10	1	.102	.123	.156	.186	.213	.297	.349	.380
20	1	.218	.232	.254	.274	.292	.349	.384	.406
25	1	.267	.278	.296	.312	.327	.373	.401	.420
30	1	.311	.320	.334	.347	.359	.395	.418	.433
40	1	.389	.394	.402	.410	.417	.438	.451	.460
50	1	.458	.460	.464	.467	.470	.479	.484	.486
50	1	.46	.46	.47	.47	.47	.49	.49	.49
60	1	.52	.52	.52	.52	.52	.52	.52	.52
70	1	.58	.58	.58	.57	.57	.56	.55	.54
80	1	.64	.63	.63	.62	.61	.60	.58	.56
90	1	.69	.68	.67	.67	.66	.63	.61	.59
100	1	.74	.73	.72	.71	.70	.66	.64	.61
110	1	.80	.78	.77	.75	.74	.70	.66	.64
120	2	.85	.84	.82	.80	.78	.73	.69	.66
130	3	.90	.89	.86	.85	.83	.77	.72	.69
140	4	.96	.94	.91	.89	.87	.80	.75	.71
150	5	1.01	.99	.97	.94	.92	.84	.78	.74
160	6	1.07	1.05	1.02	.99	.97	.88	.82	.77
170	8	1.13	1.11	1.08	1.05	1.02	.93	.86	.80
180	10	1.20	1.18	1.14	1.11	1.08	.98	.90	.83
190	13	1.27	1.25	1.21	1.17	1.14	1.03	.94	.86
200	16	1.35	1.32	1.28	1.24	1.20	1.08	.99	.90
210	19	1.44	1.41	1.36	1.32	1.28	1.15	1.04	.94
220	23	1.54	1.50	1.45	1.40	1.36	1.21	1.09	.99
230	28	1.65	1.60	1.54	1.49	1.45	1.29	1.15	1.03
240	33	1.77	1.72	1.65	1.60	1.55	1.37	1.22	1.09
250	40	1.91	1.85	1.78	1.71	1.66	1.46	1.30	1.14
260	47	2.07	2.01	1.92	1.85	1.78	1.56	1.38	1.20
270	55	2.27	2.19	2.08	2.00	1.92	1.67	1.46	1.26
280	64	2.50	2.40	2.27	2.17	2.08	1.79	1.55	1.33
290	74	2.78	2.66	2.50	2.36	2.25	1.91	1.64	1.39
300	86	3.13	2.97	2.76	2.59	2.45	2.02	1.71	1.44

Table A-5 (con't).

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	200	.016	.044	.086	.125	.159	.264		
10	200	.146	.165	.193	.219	.242	.313		
20	200	.245	.257	.276	.294	.309	.358		
25	200	.287	.297	.312	.326	.339	.379	.403	.419
30	200	.325	.333	.346	.357	.367	.399	.418	.431
40	200	.394	.399	.406	.413	.419	.438	.449	.456
50	200	.456	.458	.461	.464	.466	.474	.478	.480
50	200	.46	.46	.46	.47	.47	.48	.48	.48
60	200	.51	.51	.51	.51	.51	.51	.51	.50
70	200	.57	.56	.56	.56	.55	.54	.53	.53
80	200	.62	.61	.60	.60	.59	.58	.56	.55
90	200	.66	.66	.65	.64	.63	.61	.58	.57
100	200	.71	.70	.69	.68	.67	.64	.61	.59
110	200	.76	.75	.73	.72	.71	.67	.63	.61
120	200	.81	.79	.78	.76	.74	.70	.66	.63
130	200	.85	.84	.82	.80	.78	.73	.68	.65
140	200	.90	.88	.86	.84	.82	.76	.71	.68
150	200	.95	.93	.91	.88	.86	.79	.74	.70
160	200	1.00	.98	.95	.93	.90	.83	.77	.72
170	200	1.05	1.03	1.00	.97	.95	.86	.80	.75
180	200	1.11	1.09	1.05	1.02	.99	.90	.83	.78
190	200	1.17	1.14	1.11	1.08	1.05	.95	.87	.81
200	200	1.23	1.21	1.17	1.13	1.10	.99	.91	.84
210	200	1.30	1.27	1.23	1.19	1.16	1.04	.95	.88
220	200	1.38	1.35	1.30	1.26	1.23	1.10	1.00	.91
230	200	1.47	1.43	1.38	1.34	1.30	1.16	1.05	.96
240	200	1.56	1.52	1.47	1.42	1.38	1.23	1.11	1.00
250	200	1.67	1.63	1.57	1.51	1.47	1.31	1.18	1.05
260	200	1.79	1.74	1.67	1.62	1.57	1.40	1.25	1.11
270	200	1.93	1.88	1.80	1.74	1.68	1.49	1.33	1.17
280	200	2.10	2.03	1.94	1.87	1.80	1.60	1.42	1.24
290	200	2.30	2.21	2.11	2.02	1.94	1.71	1.51	1.31
300	200	2.54	2.43	2.30	2.19	2.10	1.82	1.60	1.37

Table A-5 (con't).

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	400	.081	.105	.140	.172	.201	.285		
10	400	.187	.202	.227	.248	.268	.326		
20	400	.270	.280	.297	.312	.325	.366		
25	400	.306	.314	.328	.340	.351	.384	.404	.418
30	400	.339	.346	.357	.367	.376	.403	.419	.429
40	400	.400	.404	.410	.416	.422	.437	.446	.452
50	400	.455	.456	.459	.462	.464	.470	.473	.474
50	400	.45	.46	.46	.46	.46	.47	.47	.47
60	400	.51	.50	.50	.50	.50	.50	.50	.49
70	400	.55	.55	.55	.54	.54	.53	.52	.51
80	400	.60	.59	.59	.58	.58	.56	.54	.53
90	400	.64	.64	.63	.62	.61	.59	.57	.55
100	400	.69	.68	.67	.65	.65	.61	.59	.57
110	400	.73	.72	.70	.69	.68	.64	.61	.59
120	400	.77	.76	.74	.73	.71	.67	.63	.61
130	400	.81	.80	.78	.76	.75	.69	.65	.63
140	400	.85	.84	.82	.80	.78	.72	.68	.65
150	400	.90	.88	.86	.83	.81	.75	.70	.67
160	400	.94	.92	.90	.87	.85	.78	.73	.69
170	400	.98	.97	.94	.91	.89	.81	.75	.71
180	400	1.03	1.01	.98	.95	.93	.84	.78	.74
190	400	1.08	1.06	1.03	1.00	.97	.88	.81	.76
200	400	1.13	1.11	1.07	1.04	1.01	.92	.84	.79
210	400	1.19	1.16	1.13	1.09	1.06	.96	.88	.82
220	400	1.25	1.22	1.18	1.15	1.11	1.00	.92	.85
230	400	1.32	1.29	1.24	1.21	1.17	1.05	.96	.88
240	400	1.39	1.36	1.31	1.27	1.23	1.11	1.01	.92
250	400	1.47	1.43	1.38	1.34	1.30	1.17	1.06	.96
260	400	1.55	1.51	1.46	1.42	1.38	1.24	1.12	1.01
270	400	1.65	1.61	1.55	1.50	1.46	1.31	1.19	1.06
280	400	1.75	1.71	1.65	1.60	1.55	1.40	1.26	1.12
290	400	1.87	1.82	1.76	1.71	1.66	1.50	1.35	1.19
300	400	2.01	1.96	1.88	1.83	1.78	1.61	1.45	1.27

Table A-5 (con't).

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	600	.138	.157	.187	.213	.236	.302		
10	600	.223	.236	.256	.275	.291	.338		
20	600	.292	.301	.316	.328	.340	.373		
25	600	.323	.331	.342	.353	.362	.390	.406	.416
30	600	.352	.358	.368	.376	.384	.406	.419	.427
40	600	.406	.409	.415	.420	.424	.437	.444	.448
50	600	.455	.456	.458	.460	.462	.467	.468	.468
50	600	.45	.46	.46	.46	.46	.47	.47	.47
60	600	.50	.50	.50	.50	.50	.49	.49	.48
70	600	.54	.54	.54	.53	.53	.52	.51	.50
80	600	.58	.58	.57	.57	.56	.55	.53	.52
90	600	.62	.62	.61	.60	.59	.57	.55	.54
100	600	.66	.66	.64	.63	.63	.59	.57	.55
110	600	.70	.69	.68	.67	.66	.62	.59	.57
120	600	.74	.73	.71	.70	.69	.64	.61	.59
130	600	.78	.76	.75	.73	.72	.67	.63	.60
140	600	.81	.80	.78	.76	.75	.69	.65	.62
150	600	.85	.84	.81	.79	.78	.72	.67	.64
160	600	.89	.87	.85	.83	.81	.74	.69	.66
170	600	.93	.91	.88	.86	.84	.77	.72	.68
180	600	.97	.95	.92	.90	.87	.80	.74	.70
190	600	1.01	.99	.96	.93	.91	.83	.76	.72
200	600	1.06	1.03	1.00	.97	.95	.86	.79	.74
210	600	1.10	1.08	1.05	1.01	.99	.89	.82	.77
220	600	1.15	1.13	1.09	1.06	1.03	.93	.85	.80
230	600	1.20	1.18	1.14	1.11	1.07	.97	.89	.82
240	600	1.26	1.23	1.19	1.16	1.12	1.01	.92	.85
250	600	1.32	1.29	1.25	1.21	1.18	1.06	.97	.89
260	600	1.39	1.36	1.31	1.27	1.24	1.12	1.01	.93
270	600	1.46	1.43	1.38	1.34	1.30	1.18	1.07	.97
280	600	1.53	1.50	1.45	1.41	1.38	1.25	1.13	1.02
290	600	1.62	1.58	1.54	1.50	1.46	1.33	1.20	1.08
300	600	1.71	1.68	1.63	1.59	1.55	1.42	1.29	1.15

Table A-5 (con't).

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	800	.186	.202	.226	.246	.265	.315		
10	800	.254	.265	.282	.297	.310	.347		
20	800	.313	.320	.332	.343	.353	.379		
25	800	.339	.346	.356	.365	.372	.395	.407	.415
30	800	.364	.370	.378	.385	.391	.409	.419	.425
40	800	.411	.414	.419	.424	.427	.438	.442	.445
50	800	.455	.456	.458	.460	.461	.464	.464	.463
50	800	.45	.46	.46	.46	.46	.46	.46	.46
60	800	.50	.50	.49	.49	.49	.49	.48	.48
70	800	.54	.53	.53	.53	.52	.51	.50	.50
80	800	.57	.57	.56	.56	.55	.54	.52	.51
90	800	.61	.60	.60	.59	.58	.56	.54	.53
100	800	.64	.64	.63	.62	.61	.58	.56	.54
110	800	.68	.67	.66	.65	.64	.60	.58	.56
120	800	.71	.70	.69	.68	.66	.63	.60	.57
130	800	.75	.74	.72	.70	.69	.65	.61	.59
140	800	.78	.77	.75	.73	.72	.67	.63	.60
150	800	.81	.80	.78	.76	.75	.69	.65	.62
160	800	.85	.83	.81	.79	.77	.71	.67	.64
170	800	.88	.87	.84	.82	.80	.74	.69	.65
180	800	.92	.90	.88	.85	.83	.76	.71	.67
190	800	.95	.94	.91	.88	.86	.79	.73	.69
200	800	.99	.97	.94	.92	.89	.81	.75	.71
210	800	1.03	1.01	.98	.95	.93	.84	.78	.73
220	800	1.07	1.05	1.02	.99	.96	.87	.80	.75
230	800	1.12	1.09	1.06	1.03	1.00	.91	.83	.78
240	800	1.16	1.14	1.10	1.07	1.04	.94	.86	.80
250	800	1.21	1.19	1.15	1.12	1.09	.98	.90	.83
260	800	1.26	1.24	1.20	1.16	1.13	1.02	.93	.86
270	800	1.32	1.29	1.25	1.22	1.18	1.07	.98	.89
280	800	1.38	1.35	1.31	1.27	1.24	1.13	1.02	.93
290	800	1.44	1.41	1.37	1.34	1.31	1.19	1.08	.98
300	800	1.51	1.48	1.44	1.41	1.38	1.26	1.15	1.03

Table A-5 (con't).

Expansivities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial T}\right)_{P,m} \times 10^3$ K

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1000	.225	.238	.257	.273	.286	.322		
10	1000	.281	.290	.304	.316	.326	.354		
20	1000	.330	.337	.347	.356	.363	.384		
25	1000	.353	.359	.367	.375	.381	.398	.407	.414
30	1000	.375	.380	.387	.393	.398	.412	.419	.423
40	1000	.417	.419	.423	.427	.430	.438	.440	.441
50	1000	.456	.457	.458	.459	.461	.462	.460	.458
50	1000	.46	.46	.46	.46	.46	.46	.46	.46
60	1000	.49	.49	.49	.49	.49	.49	.48	.48
70	1000	.53	.53	.52	.52	.52	.51	.50	.49
80	1000	.56	.56	.55	.55	.55	.53	.52	.51
90	1000	.60	.59	.58	.58	.57	.55	.53	.52
100	1000	.63	.62	.61	.61	.60	.57	.55	.53
110	1000	.66	.65	.64	.63	.62	.59	.57	.55
120	1000	.69	.68	.67	.66	.65	.61	.59	.56
130	1000	.72	.71	.70	.69	.67	.63	.60	.58
140	1000	.75	.74	.73	.71	.70	.65	.62	.59
150	1000	.78	.77	.75	.74	.72	.67	.64	.61
160	1000	.81	.80	.78	.76	.75	.70	.65	.62
170	1000	.84	.83	.81	.79	.77	.72	.67	.64
180	1000	.87	.86	.84	.82	.80	.74	.69	.65
190	1000	.91	.89	.87	.85	.83	.76	.71	.67
200	1000	.94	.92	.90	.88	.85	.78	.73	.69
210	1000	.97	.96	.93	.91	.88	.81	.75	.70
220	1000	1.01	.99	.96	.94	.91	.83	.77	.72
230	1000	1.05	1.03	1.00	.97	.95	.86	.79	.74
240	1000	1.09	1.06	1.03	1.01	.98	.89	.82	.76
250	1000	1.13	1.10	1.07	1.04	1.02	.92	.85	.79
260	1000	1.17	1.15	1.11	1.08	1.05	.96	.87	.81
270	1000	1.21	1.19	1.16	1.12	1.10	.99	.91	.84
280	1000	1.26	1.24	1.20	1.17	1.14	1.03	.94	.87
290	1000	1.31	1.29	1.25	1.22	1.19	1.08	.98	.90
300	1000	1.37	1.34	1.31	1.28	1.25	1.14	1.03	.94

Table A-6.
Compressibilities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} \times 10^4$ bar

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000	5.000
0	1	.503	.492	.475	.459	.443	.389	.346	.315	.294
10	1	.472	.463	.449	.436	.423	.377	.341	.313	.294
20	1	.453	.446	.433	.422	.411	.371	.338	.313	.294
25	1	.447	.440	.428	.417	.407	.369	.337	.313	.294
30	1	.443	.436	.425	.414	.404	.367	.337	.313	.294
40	1	.438	.432	.421	.411	.401	.367	.338	.315	.296
50	1	.438	.431	.421	.411	.402	.369	.340	.317	.299
50	1	.44	.43	.42	.41	.40	.37	.34	.32	.30
60	1	.44	.44	.43	.42	.41	.38	.35	.32	.30
70	1	.45	.44	.43	.42	.42	.38	.36	.33	.31
80	1	.46	.45	.44	.43	.43	.39	.37	.34	.32
90	1	.47	.47	.46	.45	.44	.41	.38	.35	.33
100	1	.49	.48	.47	.46	.45	.42	.39	.37	.34
110	1	.51	.50	.49	.48	.47	.44	.41	.38	.35
120	2	.53	.52	.51	.50	.49	.46	.43	.39	.36
130	3	.55	.55	.54	.53	.52	.48	.44	.41	.38
140	4	.58	.57	.56	.55	.54	.50	.47	.43	.39
150	5	.62	.61	.60	.58	.57	.53	.49	.45	.41
160	6	.65	.65	.63	.62	.61	.56	.52	.47	.42
170	8	.70	.69	.67	.66	.65	.60	.55	.50	.44
180	10	.75	.74	.72	.71	.69	.64	.58	.52	.46
190	13	.81	.80	.78	.76	.74	.68	.62	.55	.48
200	16	.87	.86	.84	.82	.80	.73	.66	.59	.50
210	19	.95	.94	.91	.89	.87	.79	.71	.63	.53
220	23	1.05	1.03	1.00	.97	.95	.86	.77	.67	.56
230	28	1.15	1.13	1.10	1.07	1.04	.93	.83	.71	.58
240	33	1.28	1.25	1.21	1.18	1.14	1.02	.89	.76	.61
250	40	1.44	1.40	1.35	1.30	1.26	1.11	.97	.82	.64
260	47	1.63	1.58	1.52	1.46	1.41	1.23	1.06	.88	.68
270	55	1.87	1.81	1.72	1.65	1.58	1.35	1.15	.94	.71
280	64	2.17	2.09	1.97	1.87	1.79	1.50	1.25	1.01	.75
290	74	2.56	2.45	2.29	2.16	2.04	1.67	1.37	1.08	.79
300	86	3.08	2.92	2.71	2.53	2.37	1.87	1.49	1.15	.82

Table A-6 (con't).
Compressibilities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} \times 10^4$ bar

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000	5.000
0	200	.474	.465	.449	.434	.420	.370			
10	200	.447	.439	.426	.414	.402	.360			
20	200	.430	.423	.412	.401	.391	.355			
25	200	.425	.418	.407	.397	.388	.353	.324	.301	.283
30	200	.420	.414	.404	.394	.385	.352	.324	.301	.284
40	200	.416	.410	.400	.391	.382	.351	.325	.303	.286
50	200	.415	.409	.400	.391	.383	.352	.327	.305	.288
50	200	.41	.41	.40	.39	.38	.35	.33	.31	.29
60	200	.42	.41	.40	.40	.39	.36	.33	.31	.29
70	200	.42	.42	.41	.40	.39	.36	.34	.32	.30
80	200	.43	.43	.42	.41	.40	.37	.35	.33	.31
90	200	.44	.44	.43	.42	.41	.38	.36	.33	.31
100	200	.45	.45	.44	.43	.42	.40	.37	.34	.32
110	200	.47	.46	.46	.45	.44	.41	.38	.36	.33
120	200	.49	.48	.47	.46	.46	.42	.40	.37	.34
130	200	.51	.50	.49	.48	.48	.44	.41	.38	.36
140	200	.53	.53	.52	.51	.50	.46	.43	.40	.37
150	200	.56	.55	.54	.53	.52	.48	.45	.42	.38
160	200	.59	.58	.57	.56	.55	.51	.47	.43	.40
170	200	.63	.62	.61	.59	.58	.54	.50	.46	.41
180	200	.67	.66	.64	.63	.62	.57	.52	.48	.43
190	200	.71	.70	.69	.67	.66	.61	.56	.50	.45
200	200	.77	.76	.74	.72	.70	.65	.59	.53	.47
210	200	.83	.81	.79	.77	.76	.69	.63	.56	.49
220	200	.90	.88	.86	.84	.82	.75	.67	.60	.52
230	200	.98	.96	.93	.91	.89	.80	.72	.64	.54
240	200	1.07	1.05	1.02	.99	.97	.87	.78	.68	.57
250	200	1.19	1.16	1.12	1.09	1.06	.95	.84	.73	.60
260	200	1.32	1.29	1.24	1.20	1.16	1.03	.91	.78	.63
270	200	1.49	1.44	1.38	1.33	1.29	1.13	.99	.84	.67
280	200	1.69	1.63	1.55	1.49	1.43	1.24	1.07	.90	.70
290	200	1.94	1.87	1.76	1.68	1.60	1.36	1.16	.96	.73
300	200	2.27	2.17	2.02	1.90	1.80	1.48	1.24	1.01	.77

Table A-6 (con't).
Compressibilities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} \times 10^4$ bar

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000	5.000
0	400	.449	.440	.426	.412	.399	.353			
10	400	.425	.418	.406	.395	.384	.345			
20	400	.410	.404	.393	.383	.374	.340			
25	400	.405	.399	.389	.380	.371	.339	.312	.290	.273
30	400	.401	.395	.386	.377	.368	.337	.312	.290	.273
40	400	.396	.391	.382	.374	.366	.337	.312	.292	.275
50	400	.395	.390	.381	.373	.365	.338	.314	.294	.278
50	400	.39	.39	.38	.37	.37	.34	.31	.29	.28
60	400	.40	.39	.38	.38	.37	.34	.32	.30	.28
70	400	.40	.40	.39	.38	.37	.35	.32	.30	.29
80	400	.41	.40	.39	.39	.38	.35	.33	.31	.29
90	400	.42	.41	.40	.40	.39	.36	.34	.32	.30
100	400	.43	.42	.41	.41	.40	.37	.35	.33	.31
110	400	.44	.43	.43	.42	.41	.38	.36	.33	.32
120	400	.46	.45	.44	.43	.42	.39	.37	.35	.32
130	400	.47	.47	.46	.45	.44	.41	.38	.36	.34
140	400	.49	.49	.48	.47	.46	.42	.40	.37	.35
150	400	.52	.51	.50	.49	.48	.44	.41	.38	.36
160	400	.54	.53	.52	.51	.50	.46	.43	.40	.37
170	400	.57	.56	.55	.54	.52	.48	.45	.42	.39
180	400	.60	.59	.58	.57	.55	.51	.47	.44	.40
190	400	.64	.63	.61	.60	.59	.54	.49	.46	.42
200	400	.68	.67	.65	.64	.62	.57	.52	.48	.44
210	400	.73	.71	.70	.68	.66	.60	.55	.50	.46
220	400	.78	.77	.74	.72	.71	.64	.59	.53	.48
230	400	.84	.82	.80	.78	.76	.69	.63	.56	.50
240	400	.91	.89	.86	.84	.82	.74	.67	.60	.52
250	400	.99	.96	.93	.91	.88	.80	.72	.64	.55
260	400	1.08	1.05	1.02	.99	.96	.86	.77	.68	.58
270	400	1.18	1.15	1.11	1.07	1.04	.94	.83	.73	.61
280	400	1.30	1.27	1.22	1.18	1.14	1.02	.90	.78	.64
290	400	1.45	1.40	1.34	1.29	1.25	1.11	.98	.84	.68
300	400	1.62	1.56	1.49	1.42	1.37	1.20	1.05	.90	.71

Table A-6 (con't).
Compressibilities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} \times 10^4$ bar

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000	5.000
0	600	.426	.418	.405	.392	.380	.338			
10	600	.405	.398	.387	.377	.367	.331			
20	600	.391	.386	.376	.367	.358	.327			
25	600	.387	.381	.372	.364	.355	.326	.300	.279	.262
30	600	.383	.378	.369	.361	.353	.325	.300	.280	.263
40	600	.378	.373	.365	.358	.350	.324	.301	.281	.265
50	600	.377	.372	.364	.357	.350	.324	.302	.283	.267
50	600	.38	.37	.36	.36	.35	.32	.30	.28	.27
60	600	.38	.37	.37	.36	.35	.33	.31	.29	.27
70	600	.38	.38	.37	.36	.36	.33	.31	.29	.27
80	600	.39	.38	.37	.37	.36	.34	.31	.30	.28
90	600	.39	.39	.38	.37	.37	.34	.32	.30	.28
100	600	.40	.40	.39	.38	.38	.35	.33	.31	.29
110	600	.42	.41	.40	.39	.39	.36	.33	.31	.30
120	600	.43	.42	.41	.40	.40	.37	.34	.32	.31
130	600	.44	.44	.43	.42	.41	.38	.35	.33	.31
140	600	.46	.45	.44	.43	.42	.39	.36	.34	.32
150	600	.48	.47	.46	.45	.44	.40	.38	.35	.34
160	600	.50	.49	.48	.47	.46	.42	.39	.37	.35
170	600	.52	.52	.50	.49	.48	.44	.40	.38	.36
180	600	.55	.54	.53	.51	.50	.45	.42	.39	.37
190	600	.58	.57	.55	.54	.52	.48	.44	.41	.39
200	600	.61	.60	.58	.57	.55	.50	.46	.43	.40
210	600	.65	.64	.62	.60	.58	.53	.48	.45	.42
220	600	.69	.68	.66	.64	.62	.56	.51	.47	.44
230	600	.74	.72	.70	.68	.66	.59	.54	.50	.46
240	600	.79	.77	.75	.72	.70	.63	.57	.52	.48
250	600	.85	.83	.80	.78	.75	.67	.61	.56	.50
260	600	.92	.89	.86	.83	.81	.72	.65	.59	.53
270	600	.99	.97	.93	.90	.87	.78	.70	.63	.56
280	600	1.08	1.05	1.01	.97	.94	.85	.76	.68	.58
290	600	1.17	1.14	1.10	1.06	1.03	.92	.82	.73	.62
300	600	1.28	1.25	1.20	1.15	1.12	1.00	.90	.78	.65

Table A-6 (con't).
Compressibilities of sodium chloride solutions: $\frac{1}{v}\left(\frac{\partial v}{\partial P}\right)_{T,m} \times 10^4$ bar

TEMP (°C)	PRESS (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000	5.000
0	1000	.382	.375	.365	.354	.344	.308			
10	1000	.368	.362	.353	.344	.336	.305			
20	1000	.358	.353	.345	.337	.330	.303			
25	1000	.354	.349	.342	.335	.328	.302	.279	.259	.241
30	1000	.351	.347	.340	.333	.326	.301	.279	.259	.242
40	1000	.347	.343	.337	.330	.324	.301	.280	.261	.244
50	1000	.346	.342	.336	.329	.323	.301	.281	.263	.246
50	1000	.35	.34	.34	.33	.32	.30	.28	.26	.25
60	1000	.35	.34	.34	.33	.32	.30	.28	.26	.25
70	1000	.35	.34	.34	.33	.33	.30	.28	.26	.25
80	1000	.35	.35	.34	.33	.33	.30	.28	.27	.25
90	1000	.36	.35	.35	.34	.33	.31	.29	.27	.25
100	1000	.37	.36	.35	.34	.34	.31	.29	.27	.26
110	1000	.37	.37	.36	.35	.34	.31	.29	.27	.26
120	1000	.38	.38	.37	.36	.35	.32	.30	.28	.27
130	1000	.39	.39	.38	.37	.36	.32	.30	.28	.27
140	1000	.41	.40	.39	.37	.36	.33	.30	.29	.28
150	1000	.42	.41	.40	.39	.37	.33	.31	.29	.29
160	1000	.44	.43	.41	.40	.38	.34	.31	.30	.30
170	1000	.45	.44	.43	.41	.40	.35	.32	.31	.31
180	1000	.47	.46	.44	.42	.41	.36	.33	.31	.31
190	1000	.49	.48	.46	.44	.42	.37	.34	.32	.33
200	1000	.52	.50	.48	.46	.44	.38	.34	.33	.34
210	1000	.54	.53	.50	.48	.46	.39	.36	.34	.35
220	1000	.57	.55	.52	.50	.48	.41	.37	.35	.36
230	1000	.60	.58	.55	.52	.50	.42	.38	.37	.38
240	1000	.63	.61	.58	.55	.52	.44	.40	.38	.39
250	1000	.67	.65	.61	.58	.55	.46	.41	.40	.41
260	1000	.71	.69	.65	.61	.58	.49	.44	.42	.43
270	1000	.76	.73	.69	.65	.62	.52	.46	.44	.44
280	1000	.81	.77	.73	.69	.66	.55	.49	.46	.47
290	1000	.86	.83	.78	.74	.70	.59	.53	.49	.49
300	1000	.92	.89	.84	.79	.76	.64	.57	.53	.52

Table A-7.
Pressure dependence of the activity coefficient: $\ln\gamma_{\pm}(P_2) - \ln\gamma_{\pm}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	200	.004	.006	.010	.013	.015	.024		
10	1	200	.003	.006	.008	.011	.013	.020		
20	1	200	.003	.005	.008	.010	.011	.017		
25	1	200	.003	.005	.007	.009	.011	.016	.020	.023
30	1	200	.003	.005	.007	.009	.010	.015	.019	.021
40	1	200	.003	.005	.007	.009	.010	.014	.017	.020
50	1	200	.003	.005	.007	.008	.010	.013	.016	.018
60	1	200	.004	.005	.007	.009	.010	.013	.016	.018
70	1	200	.004	.006	.008	.009	.010	.013	.016	.018
80	1	200	.004	.006	.008	.009	.011	.014	.016	.018
90	1	200	.005	.007	.009	.010	.011	.015	.017	.019
100	1	200	.005	.007	.009	.011	.012	.016	.018	.020
110	1	200	.005	.008	.010	.012	.013	.017	.019	.022
120	2	200	.006	.008	.011	.013	.014	.018	.021	.023
130	3	200	.006	.009	.012	.014	.015	.020	.023	.025
140	4	200	.007	.010	.013	.015	.017	.022	.025	.028
150	5	200	.008	.011	.014	.017	.019	.024	.027	.030
160	6	200	.008	.012	.016	.018	.020	.026	.030	.033
170	8	200	.009	.013	.018	.020	.022	.029	.033	.036
180	10	200	.010	.015	.019	.022	.025	.031	.036	.040
190	13	200	.011	.016	.021	.025	.027	.034	.039	.043
200	16	200	.013	.018	.024	.027	.030	.037	.043	.047
210	19	200	.014	.020	.026	.030	.033	.041	.047	.051
220	23	200	.016	.022	.029	.033	.036	.045	.050	.055
230	28	200	.017	.025	.032	.036	.040	.049	.055	.060
240	33	200	.019	.028	.035	.040	.044	.053	.059	.064
250	40	200	.022	.031	.039	.045	.048	.058	.064	.069
260	47	200	.024	.035	.044	.049	.054	.064	.070	.074
270	55	200	.027	.039	.049	.055	.059	.070	.076	.080
280	64	200	.031	.043	.054	.061	.066	.077	.083	.087
290	74	200	.035	.049	.061	.068	.074	.085	.091	.095
300	86	200	.039	.055	.068	.077	.083	.095	.101	.104

Table A-7 (con't).
Pressure dependence of the activity coefficient: $\ln\gamma_{\pm}(P_2) - \ln\gamma_{\pm}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	400	.007	.012	.019	.024	.030	.047		
10	1	400	.007	.011	.016	.021	.025	.038		
20	1	400	.006	.010	.015	.019	.022	.033		
25	1	400	.006	.010	.014	.018	.021	.031	.038	.043
30	1	400	.006	.010	.014	.017	.020	.029	.036	.041
40	1	400	.007	.010	.014	.017	.019	.027	.033	.038
50	1	400	.007	.010	.014	.017	.019	.026	.031	.035
60	1	400	.007	.011	.014	.017	.019	.025	.030	.034
70	1	400	.008	.011	.015	.017	.019	.026	.030	.034
80	1	400	.008	.012	.016	.018	.020	.027	.031	.035
90	1	400	.009	.013	.017	.020	.022	.028	.033	.037
100	1	400	.009	.014	.018	.021	.023	.030	.035	.039
110	1	400	.010	.015	.020	.023	.025	.033	.038	.042
120	2	400	.011	.016	.021	.025	.028	.035	.041	.046
130	3	400	.012	.018	.023	.027	.030	.039	.045	.050
140	4	400	.013	.020	.026	.030	.033	.042	.049	.055
150	5	400	.015	.022	.028	.033	.036	.046	.054	.060
160	6	400	.016	.024	.031	.036	.040	.051	.059	.066
170	8	400	.018	.026	.034	.040	.044	.056	.065	.072
180	10	400	.020	.029	.038	.044	.048	.062	.071	.079
190	13	400	.022	.032	.042	.048	.053	.068	.078	.087
200	16	400	.025	.036	.046	.053	.059	.074	.085	.095
210	19	400	.028	.040	.051	.059	.065	.082	.094	.103
220	23	400	.031	.044	.057	.065	.072	.090	.102	.113
230	28	400	.035	.050	.064	.073	.080	.099	.112	.123
240	33	400	.039	.056	.071	.081	.089	.109	.122	.133
250	40	400	.044	.063	.080	.091	.099	.121	.134	.145
260	47	400	.050	.071	.090	.102	.111	.134	.148	.159
270	55	400	.057	.081	.102	.116	.125	.149	.163	.174
280	64	400	.066	.093	.117	.132	.142	.168	.182	.192
290	74	400	.076	.107	.135	.151	.163	.190	.204	.214
300	86	400	.089	.125	.157	.176	.189	.218	.232	.241

Table A-7 (con't).
Pressure dependence of the activity coefficient: $\ln\gamma_{\pm}(P_2) - \ln\gamma_{\pm}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	600	.010	.018	.027	.036	.043	.067		
10	1	600	.010	.016	.024	.030	.036	.055		
20	1	600	.009	.015	.022	.027	.032	.047		
25	1	600	.009	.015	.021	.026	.030	.044	.055	.063
30	1	600	.009	.015	.021	.025	.029	.042	.052	.059
40	1	600	.010	.015	.020	.024	.028	.039	.048	.054
50	1	600	.010	.015	.020	.024	.027	.037	.045	.051
60	1	600	.010	.015	.021	.024	.028	.037	.044	.050
70	1	600	.011	.016	.022	.025	.028	.038	.044	.050
80	1	600	.012	.017	.023	.027	.030	.039	.046	.051
90	1	600	.013	.019	.024	.028	.032	.041	.048	.054
100	1	600	.014	.020	.026	.031	.034	.044	.051	.057
110	1	600	.015	.022	.028	.033	.037	.047	.055	.061
120	2	600	.016	.024	.031	.036	.040	.051	.060	.066
130	3	600	.018	.026	.034	.039	.044	.056	.065	.073
140	4	600	.019	.028	.037	.043	.048	.061	.071	.079
150	5	600	.021	.031	.040	.047	.052	.067	.078	.087
160	6	600	.024	.034	.045	.052	.058	.074	.086	.096
170	8	600	.026	.038	.049	.057	.063	.081	.094	.105
180	10	600	.029	.042	.054	.063	.070	.089	.103	.115
190	13	600	.032	.046	.060	.069	.077	.098	.113	.126
200	16	600	.035	.051	.066	.076	.085	.108	.124	.138
210	19	600	.039	.057	.073	.085	.093	.118	.136	.151
220	23	600	.044	.063	.081	.094	.103	.130	.149	.165
230	28	600	.049	.071	.091	.104	.115	.143	.163	.179
240	33	600	.055	.079	.101	.116	.127	.157	.178	.196
250	40	600	.063	.089	.114	.130	.142	.174	.195	.213
260	47	600	.071	.101	.128	.146	.159	.192	.214	.233
270	55	600	.081	.115	.145	.164	.179	.214	.237	.254
280	64	600	.093	.131	.165	.187	.202	.240	.262	.280
290	74	600	.107	.151	.190	.214	.231	.271	.293	.310
300	86	600	.125	.176	.220	.247	.266	.308	.330	.346

Table A-7 (con't).
Pressure dependence of the activity coefficient: $\ln\gamma_{\pm}(P_2) - \ln\gamma_{\pm}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	1000	.016	.028	.043	.056	.067	.104		
10	1	1000	.015	.025	.038	.048	.057	.086		
20	1	1000	.015	.024	.035	.043	.051	.075		
25	1	1000	.015	.023	.033	.041	.048	.069	.085	.096
30	1	1000	.015	.023	.033	.040	.046	.066	.081	.091
40	1	1000	.015	.023	.032	.038	.044	.061	.074	.084
50	1	1000	.016	.024	.032	.038	.043	.059	.070	.080
60	1	1000	.017	.025	.033	.039	.043	.058	.069	.078
70	1	1000	.018	.026	.034	.040	.045	.059	.069	.078
80	1	1000	.019	.027	.036	.042	.047	.061	.071	.080
90	1	1000	.020	.029	.038	.045	.050	.064	.075	.084
100	1	1000	.022	.031	.041	.048	.053	.068	.080	.089
110	1	1000	.023	.034	.044	.051	.057	.074	.085	.095
120	2	1000	.025	.037	.048	.056	.062	.080	.092	.103
130	3	1000	.027	.040	.052	.061	.067	.087	.101	.112
140	4	1000	.030	.044	.057	.066	.074	.095	.110	.122
150	5	1000	.033	.048	.062	.072	.080	.103	.120	.134
160	6	1000	.036	.052	.068	.079	.088	.113	.132	.147
170	8	1000	.039	.057	.075	.087	.096	.124	.144	.161
180	10	1000	.043	.063	.082	.095	.106	.136	.158	.176
190	13	1000	.048	.069	.090	.105	.116	.149	.172	.193
200	16	1000	.053	.077	.099	.115	.128	.163	.188	.210
210	19	1000	.059	.085	.110	.127	.140	.178	.206	.230
220	23	1000	.065	.094	.121	.140	.154	.195	.225	.250
230	28	1000	.073	.104	.134	.155	.170	.214	.245	.272
240	33	1000	.081	.116	.149	.171	.188	.235	.268	.296
250	40	1000	.091	.130	.166	.190	.209	.258	.292	.322
260	47	1000	.103	.146	.186	.212	.232	.284	.320	.350
270	55	1000	.116	.165	.209	.237	.259	.313	.350	.382
280	64	1000	.132	.187	.236	.267	.290	.348	.385	.417
290	74	1000	.151	.213	.268	.303	.328	.388	.425	.456
300	86	1000	.175	.245	.307	.346	.373	.436	.473	.503

Table A-8.
Pressure dependence of the osmotic coefficient: $\phi(P_2) - \phi(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	200	.001	.002	.004	.005	.006	.010		
10	1	200	.001	.002	.003	.004	.005	.007		
20	1	200	.001	.002	.003	.003	.004	.006		
25	1	200	.001	.002	.002	.003	.004	.006	.007	.008
30	1	200	.001	.002	.002	.003	.003	.005	.006	.007
40	1	200	.001	.002	.002	.003	.003	.005	.006	.006
50	1	200	.001	.002	.002	.003	.003	.004	.005	.006
60	1	200	.001	.002	.002	.003	.003	.004	.005	.005
70	1	200	.001	.002	.002	.003	.003	.004	.005	.005
80	1	200	.001	.002	.002	.003	.003	.004	.005	.005
90	1	200	.001	.002	.002	.003	.003	.004	.005	.005
100	1	200	.001	.002	.003	.003	.003	.004	.005	.005
110	1	200	.002	.002	.003	.003	.004	.005	.005	.006
120	2	200	.002	.002	.003	.004	.004	.005	.006	.006
130	3	200	.002	.003	.003	.004	.004	.005	.006	.007
140	4	200	.002	.003	.004	.004	.005	.006	.007	.007
150	5	200	.002	.003	.004	.005	.005	.006	.007	.008
160	6	200	.003	.004	.004	.005	.006	.007	.008	.009
170	8	200	.003	.004	.005	.006	.006	.008	.009	.010
180	10	200	.003	.004	.005	.006	.007	.008	.009	.010
190	13	200	.003	.005	.006	.007	.007	.009	.010	.011
200	16	200	.004	.005	.006	.007	.008	.009	.011	.012
210	19	200	.004	.006	.007	.008	.009	.010	.011	.012
220	23	200	.005	.006	.008	.009	.009	.011	.012	.013
230	28	200	.005	.007	.009	.009	.010	.012	.013	.014
240	33	200	.006	.008	.009	.010	.011	.012	.013	.014
250	40	200	.006	.009	.010	.011	.012	.013	.014	.014
260	47	200	.007	.010	.011	.012	.013	.014	.014	.015
270	55	200	.008	.011	.013	.014	.014	.015	.015	.015
280	64	200	.009	.012	.014	.015	.015	.016	.015	.015
290	74	200	.010	.013	.016	.017	.017	.017	.016	.015
300	86	200	.011	.015	.017	.018	.019	.018	.017	.015

Table A-8 (con't).
Pressure dependence of the osmotic coefficient: $\phi(P_2) - \phi(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	400	.002	.004	.007	.010	.012	.018		
10	1	400	.002	.004	.006	.008	.009	.014		
20	1	400	.002	.003	.005	.007	.008	.012		
25	1	400	.002	.003	.005	.006	.007	.011	.013	.015
30	1	400	.002	.003	.005	.006	.007	.010	.012	.014
40	1	400	.002	.003	.004	.005	.006	.009	.011	.012
50	1	400	.002	.003	.004	.005	.006	.008	.010	.011
60	1	400	.002	.003	.004	.005	.006	.008	.009	.010
70	1	400	.002	.003	.004	.005	.006	.007	.009	.010
80	1	400	.002	.004	.004	.005	.006	.007	.009	.010
90	1	400	.003	.004	.005	.005	.006	.008	.009	.010
100	1	400	.003	.004	.005	.006	.006	.008	.010	.011
110	1	400	.003	.004	.006	.006	.007	.009	.010	.011
120	2	400	.003	.005	.006	.007	.008	.010	.011	.012
130	3	400	.004	.005	.007	.008	.008	.010	.012	.013
140	4	400	.004	.006	.007	.008	.009	.011	.013	.015
150	5	400	.004	.006	.008	.009	.010	.012	.014	.016
160	6	400	.005	.007	.009	.010	.011	.014	.016	.018
170	8	400	.005	.008	.010	.011	.012	.015	.017	.019
180	10	400	.006	.008	.011	.012	.013	.016	.019	.021
190	13	400	.007	.009	.012	.013	.014	.018	.020	.023
200	16	400	.007	.010	.013	.014	.016	.019	.022	.024
210	19	400	.008	.011	.014	.016	.017	.021	.024	.026
220	23	400	.009	.013	.016	.017	.019	.022	.025	.028
230	28	400	.010	.014	.017	.019	.021	.024	.027	.029
240	33	400	.012	.016	.019	.021	.022	.026	.028	.031
250	40	400	.013	.018	.021	.023	.025	.028	.030	.032
260	47	400	.015	.020	.024	.026	.027	.030	.031	.033
270	55	400	.017	.023	.027	.029	.030	.032	.033	.034
280	64	400	.019	.026	.030	.032	.034	.035	.035	.035
290	74	400	.022	.030	.035	.037	.038	.038	.037	.036
300	86	400	.026	.034	.040	.042	.043	.042	.040	.037

Table A-8 (con't).
Pressure dependence of the osmotic coefficient: $\phi(P_2) - \phi(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	600	.004	.006	.010	.014	.017	.026		
10	1	600	.003	.006	.009	.011	.014	.021		
20	1	600	.003	.005	.008	.010	.011	.017		
25	1	600	.003	.005	.007	.009	.010	.016	.019	.021
30	1	600	.003	.005	.007	.008	.010	.014	.018	.020
40	1	600	.003	.005	.006	.008	.009	.013	.015	.017
50	1	600	.003	.005	.006	.007	.008	.012	.014	.016
60	1	600	.003	.005	.006	.007	.008	.011	.013	.015
70	1	600	.003	.005	.006	.007	.008	.011	.013	.014
80	1	600	.004	.005	.007	.008	.008	.011	.013	.014
90	1	600	.004	.005	.007	.008	.009	.011	.013	.015
100	1	600	.004	.006	.007	.009	.009	.012	.014	.016
110	1	600	.005	.006	.008	.009	.010	.013	.015	.017
120	2	600	.005	.007	.009	.010	.011	.014	.016	.018
130	3	600	.005	.008	.010	.011	.012	.015	.018	.020
140	4	600	.006	.008	.010	.012	.013	.017	.019	.022
150	5	600	.006	.009	.011	.013	.014	.018	.021	.024
160	6	600	.007	.010	.013	.014	.016	.020	.023	.026
170	8	600	.008	.011	.014	.016	.017	.022	.025	.028
180	10	600	.009	.012	.015	.017	.019	.024	.028	.031
190	13	600	.010	.013	.017	.019	.021	.026	.030	.034
200	16	600	.011	.015	.018	.021	.023	.028	.033	.037
210	19	600	.012	.016	.020	.023	.025	.031	.035	.039
220	23	600	.013	.018	.022	.025	.027	.033	.038	.042
230	28	600	.015	.020	.025	.028	.030	.036	.040	.045
240	33	600	.017	.022	.027	.030	.033	.038	.043	.047
250	40	600	.019	.025	.030	.034	.036	.041	.045	.049
260	47	600	.021	.028	.034	.037	.039	.044	.048	.051
270	55	600	.024	.032	.038	.041	.043	.047	.050	.053
280	64	600	.027	.036	.043	.046	.048	.051	.053	.055
290	74	600	.032	.042	.049	.052	.054	.056	.055	.056
300	86	600	.037	.048	.056	.060	.061	.061	.059	.057

Table A-8 (con't).
Pressure dependence of the osmotic coefficient: $\phi(P_2) - \phi(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
0	1	1000	.006	.010	.016	.022	.026	.040		
10	1	1000	.005	.009	.014	.018	.021	.032		
20	1	1000	.005	.008	.012	.015	.018	.026		
25	1	1000	.005	.008	.011	.014	.016	.024	.029	.031
30	1	1000	.005	.007	.011	.013	.015	.022	.027	.029
40	1	1000	.005	.007	.010	.012	.014	.020	.024	.027
50	1	1000	.005	.007	.010	.012	.013	.018	.022	.024
60	1	1000	.005	.007	.010	.011	.013	.017	.020	.023
70	1	1000	.005	.008	.010	.011	.013	.017	.020	.022
80	1	1000	.006	.008	.010	.012	.013	.017	.020	.022
90	1	1000	.006	.009	.011	.012	.014	.018	.021	.023
100	1	1000	.007	.009	.012	.013	.015	.019	.022	.024
110	1	1000	.007	.010	.013	.014	.016	.020	.023	.026
120	2	1000	.008	.011	.014	.016	.017	.022	.025	.028
130	3	1000	.008	.012	.015	.017	.019	.023	.027	.030
140	4	1000	.009	.013	.016	.018	.020	.026	.030	.033
150	5	1000	.010	.014	.018	.020	.022	.028	.032	.036
160	6	1000	.011	.015	.019	.022	.024	.031	.036	.040
170	8	1000	.012	.017	.021	.024	.026	.033	.039	.044
180	10	1000	.013	.018	.023	.026	.029	.036	.042	.048
190	13	1000	.014	.020	.025	.029	.032	.040	.046	.052
200	16	1000	.016	.022	.028	.031	.034	.043	.050	.057
210	19	1000	.018	.024	.030	.034	.038	.047	.054	.061
220	23	1000	.020	.027	.033	.038	.041	.050	.058	.066
230	28	1000	.022	.030	.037	.041	.045	.054	.062	.070
240	33	1000	.024	.033	.041	.045	.049	.058	.066	.075
250	40	1000	.027	.037	.045	.050	.053	.062	.070	.079
260	47	1000	.031	.041	.050	.055	.058	.067	.074	.083
270	55	1000	.034	.046	.055	.060	.064	.072	.078	.086
280	64	1000	.039	.052	.062	.067	.070	.077	.082	.089
290	74	1000	.045	.059	.070	.075	.078	.082	.086	.091
300	86	1000	.051	.068	.079	.084	.087	.089	.090	.093

Table A-9. Pressure dependence of the heat of solution: $\frac{\Delta \bar{H}_s}{RT}(P_2) - \frac{\Delta \bar{H}_s}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{H}_2^\circ}{RT}$	MOLALITY .001	.005	.010	.020	.030	.040	.050	.100
25	1	200	-4.2E-02	-2.6E-01	-2.6E-01	-2.6E-01	-2.6E-01	-2.6E-01	-2.6E-01	-2.6E-01	-2.6E-01
30	1	200	-8.6E-03	-2.2E-01	-2.2E-01	-2.2E-01	-2.2E-01	-2.2E-01	-2.2E-01	-2.2E-01	-2.2E-01
40	1	200	4.7E-02	-1.6E-01	-1.6E-01	-1.6E-01	-1.6E-01	-1.6E-01	-1.6E-01	-1.6E-01	-1.6E-01
50	1	200	9.4E-02	-1.0E-01	-1.1E-01	-1.1E-01	-1.1E-01	-1.1E-01	-1.1E-01	-1.1E-01	-1.1E-01
60	1	200	1.3E-01	-5.9E-02	-6.0E-02	-6.1E-02	-6.3E-02	-6.4E-02	-6.4E-02	-6.5E-02	-6.7E-02
70	1	200	1.7E-01	-1.7E-02	-1.9E-02	-2.0E-02	-2.2E-02	-2.3E-02	-2.4E-02	-2.5E-02	-2.8E-02
80	1	200	2.0E-01	2.2E-02	2.0E-02	1.9E-02	1.6E-02	1.5E-02	1.4E-02	1.3E-02	8.9E-03
90	1	200	2.4E-01	6.0E-02	5.7E-02	5.5E-02	5.3E-02	5.1E-02	4.9E-02	4.8E-02	4.4E-02
100	1	200	2.7E-01	9.6E-02	9.3E-02	9.1E-02	8.8E-02	8.6E-02	8.4E-02	8.3E-02	7.7E-02
110	1	200	3.0E-01	1.3E-01	1.3E-01	1.3E-01	1.2E-01	1.2E-01	1.2E-01	1.2E-01	1.1E-01
120	2	200	3.3E-01	1.7E-01	1.6E-01	1.6E-01	1.6E-01	1.5E-01	1.5E-01	1.5E-01	1.4E-01
130	3	200	3.7E-01	2.0E-01	2.0E-01	2.0E-01	1.9E-01	1.9E-01	1.9E-01	1.8E-01	1.7E-01
140	4	200	4.0E-01	2.4E-01	2.4E-01	2.3E-01	2.3E-01	2.2E-01	2.2E-01	2.2E-01	2.1E-01
150	5	200	4.4E-01	2.8E-01	2.8E-01	2.7E-01	2.7E-01	2.6E-01	2.6E-01	2.5E-01	2.4E-01
160	6	200	4.8E-01	3.3E-01	3.2E-01	3.1E-01	3.1E-01	3.0E-01	3.0E-01	2.9E-01	2.8E-01
170	8	200	5.2E-01	3.7E-01	3.6E-01	3.6E-01	3.5E-01	3.4E-01	3.4E-01	3.3E-01	3.2E-01
180	10	200	5.7E-01	4.2E-01	4.1E-01	4.1E-01	4.0E-01	3.9E-01	3.8E-01	3.8E-01	3.6E-01
190	13	200	6.2E-01	4.8E-01	4.7E-01	4.6E-01	4.5E-01	4.4E-01	4.3E-01	4.2E-01	4.0E-01
200	16	200	6.8E-01	5.4E-01	5.3E-01	5.2E-01	5.0E-01	4.9E-01	4.9E-01	4.8E-01	4.5E-01
210	19	200	7.5E-01	6.2E-01	6.0E-01	5.9E-01	5.7E-01	5.6E-01	5.5E-01	5.4E-01	5.1E-01
220	23	200	8.3E-01	7.0E-01	6.8E-01	6.7E-01	6.5E-01	6.3E-01	6.2E-01	6.1E-01	5.7E-01
230	28	200	9.4E-01	8.0E-01	7.8E-01	7.6E-01	7.4E-01	7.2E-01	7.1E-01	6.9E-01	6.5E-01
240	33	200	1.1E+00	9.3E-01	9.0E-01	8.8E-01	8.5E-01	8.3E-01	8.1E-01	8.0E-01	7.4E-01
250	40	200	1.2E+00	1.1E+00	1.0E+00	1.0E+00	9.8E-01	9.6E-01	9.4E-01	9.2E-01	8.6E-01
260	47	200	1.4E+00	1.3E+00	1.2E+00	1.2E+00	1.2E+00	1.1E+00	1.1E+00	1.1E+00	1.0E+00
270	55	200	1.7E+00	1.5E+00	1.5E+00	1.4E+00	1.4E+00	1.3E+00	1.3E+00	1.3E+00	1.2E+00
280	64	200	2.0E+00	1.8E+00	1.8E+00	1.7E+00	1.7E+00	1.6E+00	1.6E+00	1.5E+00	1.4E+00
290	74	200	2.4E+00	2.3E+00	2.2E+00	2.1E+00	2.0E+00	2.0E+00	1.9E+00	1.9E+00	1.7E+00
300	86	200	3.0E+00	2.9E+00	2.8E+00	2.7E+00	2.6E+00	2.5E+00	2.4E+00	2.4E+00	2.2E+00

Table A-9 (con't). Pressure dependence of the heat of solution: $\frac{\Delta \bar{H}_s}{RT}(P_2) - \frac{\Delta \bar{H}_s}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{H}_2^{o}}{RT}$	MOLALITY .001	.005	.010	.020	.030	.040	.050	.100
25	1	400	-5.8E-02	-4.9E-01	-4.9E-01	-4.9E-01	-4.9E-01	-4.9E-01	-4.9E-01	-4.9E-01	-4.9E-01
30	1	400	5.1E-03	-4.2E-01	-4.2E-01	-4.2E-01	-4.2E-01	-4.2E-01	-4.2E-01	-4.2E-01	-4.2E-01
40	1	400	1.1E-01	-3.0E-01	-3.0E-01	-3.0E-01	-3.0E-01	-3.0E-01	-3.1E-01	-3.1E-01	-3.1E-01
50	1	400	2.0E-01	-2.0E-01	-2.0E-01	-2.0E-01	-2.0E-01	-2.1E-01	-2.1E-01	-2.1E-01	-2.1E-01
60	1	400	2.8E-01	-1.1E-01	-1.1E-01	-1.2E-01	-1.2E-01	-1.2E-01	-1.2E-01	-1.2E-01	-1.3E-01
70	1	400	3.5E-01	-3.0E-02	-3.3E-02	-3.6E-02	-3.9E-02	-4.2E-02	-4.3E-02	-4.5E-02	-5.1E-02
80	1	400	4.1E-01	4.5E-02	4.1E-02	3.8E-02	3.4E-02	3.1E-02	2.9E-02	2.7E-02	1.9E-02
90	1	400	4.7E-01	1.2E-01	1.1E-01	1.1E-01	1.0E-01	1.0E-01	9.7E-02	9.5E-02	8.6E-02
100	1	400	5.3E-01	1.9E-01	1.8E-01	1.8E-01	1.7E-01	1.7E-01	1.6E-01	1.6E-01	1.5E-01
110	1	400	5.9E-01	2.5E-01	2.5E-01	2.4E-01	2.4E-01	2.3E-01	2.3E-01	2.2E-01	2.1E-01
120	2	400	6.5E-01	3.2E-01	3.2E-01	3.1E-01	3.0E-01	3.0E-01	2.9E-01	2.9E-01	2.7E-01
130	3	400	7.2E-01	3.9E-01	3.8E-01	3.8E-01	3.7E-01	3.6E-01	3.6E-01	3.5E-01	3.4E-01
140	4	400	7.8E-01	4.7E-01	4.6E-01	4.5E-01	4.4E-01	4.3E-01	4.3E-01	4.2E-01	4.0E-01
150	5	400	8.5E-01	5.4E-01	5.3E-01	5.2E-01	5.1E-01	5.0E-01	4.9E-01	4.9E-01	4.7E-01
160	6	400	9.3E-01	6.2E-01	6.1E-01	6.0E-01	5.9E-01	5.8E-01	5.7E-01	5.6E-01	5.3E-01
170	8	400	1.0E+00	7.1E-01	7.0E-01	6.8E-01	6.7E-01	6.6E-01	6.5E-01	6.4E-01	6.1E-01
180	10	400	1.1E+00	8.1E-01	7.9E-01	7.8E-01	7.6E-01	7.4E-01	7.3E-01	7.2E-01	6.9E-01
190	13	400	1.2E+00	9.2E-01	8.9E-01	8.8E-01	8.6E-01	8.4E-01	8.3E-01	8.1E-01	7.7E-01
200	16	400	1.3E+00	1.0E+00	1.0E+00	9.9E-01	9.7E-01	9.5E-01	9.3E-01	9.2E-01	8.7E-01
210	19	400	1.5E+00	1.2E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.0E+00	9.8E-01
220	23	400	1.6E+00	1.3E+00	1.3E+00	1.3E+00	1.2E+00	1.2E+00	1.2E+00	1.2E+00	1.1E+00
230	28	400	1.8E+00	1.5E+00	1.5E+00	1.5E+00	1.4E+00	1.4E+00	1.4E+00	1.3E+00	1.2E+00
240	33	400	2.1E+00	1.8E+00	1.7E+00	1.7E+00	1.6E+00	1.6E+00	1.6E+00	1.5E+00	1.4E+00
250	40	400	2.3E+00	2.1E+00	2.0E+00	2.0E+00	1.9E+00	1.8E+00	1.8E+00	1.8E+00	1.6E+00
260	47	400	2.7E+00	2.4E+00	2.4E+00	2.3E+00	2.2E+00	2.2E+00	2.1E+00	2.1E+00	1.9E+00
270	55	400	3.2E+00	2.9E+00	2.8E+00	2.7E+00	2.6E+00	2.6E+00	2.5E+00	2.5E+00	2.3E+00
280	64	400	3.9E+00	3.6E+00	3.4E+00	3.3E+00	3.2E+00	3.1E+00	3.0E+00	3.0E+00	2.7E+00
290	74	400	4.8E+00	4.4E+00	4.3E+00	4.2E+00	4.0E+00	3.9E+00	3.8E+00	3.7E+00	3.4E+00
300	86	400	6.0E+00	5.7E+00	5.5E+00	5.3E+00	5.1E+00	4.9E+00	4.8E+00	4.7E+00	4.3E+00

Table A-9 (con't). Pressure dependence of the heat of solution: $\frac{\Delta\bar{H}_s}{RT}(P_2) - \frac{\Delta\bar{H}_s}{RT}(P_1)$

TEMP (C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{H}_2^\circ}{RT}$	MOLALITY .001	.005	.010	.020	.030	.040	.050	.100
25	1	600	-5.0E-02	-7.0E-01	-7.0E-01	-7.0E-01	-7.0E-01	-7.0E-01	-7.0E-01	-7.0E-01	-7.0E-01
30	1	600	4.0E-02	-6.0E-01	-6.0E-01	-6.0E-01	-6.0E-01	-6.0E-01	-6.0E-01	-6.0E-01	-6.0E-01
40	1	600	1.9E-01	-4.3E-01	-4.3E-01	-4.3E-01	-4.3E-01	-4.3E-01	-4.4E-01	-4.4E-01	-4.4E-01
50	1	600	3.1E-01	-2.8E-01	-2.9E-01	-2.9E-01	-2.9E-01	-2.9E-01	-2.9E-01	-3.0E-01	-3.0E-01
60	1	600	4.2E-01	-1.6E-01	-1.6E-01	-1.6E-01	-1.7E-01	-1.7E-01	-1.7E-01	-1.7E-01	-1.8E-01
70	1	600	5.2E-01	-4.1E-02	-4.6E-02	-4.9E-02	-5.4E-02	-5.7E-02	-6.0E-02	-6.3E-02	-7.1E-02
80	1	600	6.1E-01	6.6E-02	6.0E-02	5.6E-02	5.0E-02	4.6E-02	4.3E-02	4.0E-02	3.0E-02
90	1	600	7.0E-01	1.7E-01	1.6E-01	1.6E-01	1.5E-01	1.4E-01	1.4E-01	1.4E-01	1.2E-01
100	1	600	7.9E-01	2.7E-01	2.6E-01	2.5E-01	2.5E-01	2.4E-01	2.4E-01	2.3E-01	2.2E-01
110	1	600	8.7E-01	3.6E-01	3.6E-01	3.5E-01	3.4E-01	3.3E-01	3.3E-01	3.2E-01	3.1E-01
120	2	600	9.6E-01	4.6E-01	4.5E-01	4.4E-01	4.3E-01	4.3E-01	4.2E-01	4.1E-01	3.9E-01
130	3	600	1.0E+00	5.6E-01	5.5E-01	5.4E-01	5.3E-01	5.2E-01	5.1E-01	5.1E-01	4.8E-01
140	4	600	1.1E+00	6.7E-01	6.5E-01	6.4E-01	6.3E-01	6.2E-01	6.1E-01	6.0E-01	5.7E-01
150	5	600	1.2E+00	7.7E-01	7.6E-01	7.5E-01	7.3E-01	7.2E-01	7.1E-01	7.0E-01	6.7E-01
160	6	600	1.3E+00	8.9E-01	8.7E-01	8.5E-01	8.4E-01	8.2E-01	8.1E-01	8.0E-01	7.6E-01
170	8	600	1.5E+00	1.0E+00	9.9E-01	9.7E-01	9.5E-01	9.3E-01	9.2E-01	9.1E-01	8.7E-01
180	10	600	1.6E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.0E+00	1.0E+00	9.8E-01
190	13	600	1.7E+00	1.3E+00	1.3E+00	1.2E+00	1.2E+00	1.2E+00	1.2E+00	1.2E+00	1.1E+00
200	16	600	1.9E+00	1.5E+00	1.4E+00	1.4E+00	1.4E+00	1.3E+00	1.3E+00	1.3E+00	1.2E+00
210	19	600	2.1E+00	1.7E+00	1.6E+00	1.6E+00	1.5E+00	1.5E+00	1.5E+00	1.5E+00	1.4E+00
220	23	600	2.3E+00	1.9E+00	1.8E+00	1.8E+00	1.7E+00	1.7E+00	1.7E+00	1.6E+00	1.5E+00
230	28	600	2.5E+00	2.1E+00	2.1E+00	2.0E+00	2.0E+00	1.9E+00	1.9E+00	1.8E+00	1.7E+00
240	33	600	2.9E+00	2.4E+00	2.4E+00	2.3E+00	2.2E+00	2.2E+00	2.1E+00	2.1E+00	2.0E+00
250	40	600	3.2E+00	2.8E+00	2.7E+00	2.7E+00	2.6E+00	2.5E+00	2.5E+00	2.4E+00	2.2E+00
260	47	600	3.7E+00	3.3E+00	3.2E+00	3.1E+00	3.0E+00	2.9E+00	2.8E+00	2.8E+00	2.6E+00
270	55	600	4.3E+00	3.9E+00	3.7E+00	3.7E+00	3.5E+00	3.4E+00	3.3E+00	3.3E+00	3.0E+00
280	64	600	5.1E+00	4.7E+00	4.5E+00	4.4E+00	4.2E+00	4.1E+00	4.0E+00	3.9E+00	3.6E+00
290	74	600	6.2E+00	5.7E+00	5.5E+00	5.4E+00	5.1E+00	5.0E+00	4.9E+00	4.8E+00	4.4E+00
300	86	600	7.7E+00	7.2E+00	6.9E+00	6.7E+00	6.4E+00	6.2E+00	6.1E+00	5.9E+00	5.4E+00

Table A-9 (con't). Pressure dependence of the heat of solution: $\frac{\Delta \bar{H}_s}{RT}(P_2) - \frac{\Delta \bar{H}_s}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{H}_2^\circ}{RT}$	MOLALITY .001	.005	.010	.020	.030	.040	.050	.100
25	1	1000	3.4E-02	-1.0E+00	-1.0E+00	-1.0E+00	-1.0E+00	-1.0E+00	-1.0E+00	-1.0E+00	-1.0E+00
30	1	1000	1.6E-01	-8.9E-01	-9.0E-01	-9.0E-01	-9.0E-01	-9.0E-01	-9.0E-01	-9.0E-01	-9.0E-01
40	1	1000	3.8E-01	-6.4E-01	-6.5E-01	-6.5E-01	-6.5E-01	-6.[illegible]E-01	-6.6E-01	-6.6E-01	-6.6E-01
50	1	1000	5.7E-01	-4.3E-01	-4.3E-01	-4.4E-01	-4.4E-01	-4.4E-01	-[illegible].5E-01	-4.5E-01	-4.5E-01
60	1	1000	7.3E-01	-2.4E-01	-2.4E-01	-2.5E-01	-2.5E-01	-2.6E-01	-2.6E-01	-2.6E-01	-2.7E-01
70	1	1000	8.7E-01	-6.5E-02	-7.3E-02	-7.8E-02	-8.5E-02	-9.0E-02	-9.4E-02	-9.8E-02	-1.1E-01
80	1	1000	1.0E+00	9.5E-02	8.6E-02	8.0E-02	7.2E-02	6.5E-02	6.0E-02	5.6E-02	4.0E-02
90	1	1000	1.1E+00	2.5E-01	2.4E-01	2.3E-01	2.2E-01	2.1E-01	2.1E-01	2.0E-01	1.8E-01
100	1	1000	1.3E+00	4.0E-01	3.8E-01	3.8E-01	3.6E-01	3.5E-01	3.5E-01	3.4E-01	3.2E-01
110	1	1000	1.4E+00	5.4E-01	5.3E-01	5.2E-01	5.0E-01	4.9E-01	4.9E-01	4.8E-01	4.5E-01
120	2	1000	1.5E+00	6.9E-01	6.7E-01	6.6E-01	6.4E-01	6.3E-01	6.2E-01	6.1E-01	5.8E-01
130	3	1000	1.6E+00	8.3E-01	8.2E-01	8.0E-01	7.8E-01	7.7E-01	7.6E-01	7.5E-01	7.2E-01
140	4	1000	1.8E+00	9.9E-01	9.6E-01	9.5E-01	9.3E-01	9.1E-01	9.0E-01	8.9E-01	8.5E-01
150	5	1000	1.9E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.1E+00	1.0E+00	1.0E+00	9.8E-01
160	6	1000	2.1E+00	1.3E+00	1.3E+00	1.3E+00	1.2E+00	1.2E+00	1.2E+00	1.2E+00	1.1E+00
170	8	1000	2.2E+00	1.5E+00	1.5E+00	1.4E+00	1.4E+00	1.4E+00	1.4E+00	1.3E+00	1.3E+00
180	10	1000	2.4E+00	1.7E+00	1.6E+00	1.6E+00	1.6E+00	1.5E+00	1.5E+00	1.5E+00	1.4E+00
190	13	1000	2.6E+00	1.9E+00	1.8E+00	1.8E+00	1.8E+00	1.7E+00	1.7E+00	1.7E+00	1.6E+00
200	16	1000	2.8E+00	2.1E+00	2.1E+00	2.0E+00	2.0E+00	1.9E+00	1.9E+00	1.9E+00	1.8E+00
210	19	1000	3.1E+00	2.4E+00	2.3E+00	2.3E+00	2.2E+00	2.2E+00	2.1E+00	2.1E+00	2.0E+00
220	23	1000	3.4E+00	2.7E+00	2.6E+00	2.6E+00	2.5E+00	2.4E+00	2.4E+00	2.4E+00	2.2E+00
230	28	1000	3.7E+00	3.0E+00	2.9E+00	2.9E+00	2.8E+00	2.7E+00	2.7E+00	2.6E+00	2.5E+00
240	33	1000	4.1E+00	3.4E+00	3.3E+00	3.2E+00	3.1E+00	3.1E+00	3.0E+00	3.0E+00	2.8E+00
250	40	1000	4.6E+00	3.9E+00	3.8E+00	3.7E+00	3.6E+00	3.5E+00	3.4E+00	3.3E+00	3.1E+00
260	47	1000	5.2E+00	4.5E+00	4.3E+00	4.2E+00	4.1E+00	4.0E+00	3.9E+00	3.8E+00	3.5E+00
270	55	1000	5.9E+00	5.2E+00	5.0E+00	4.9E+00	4.7E+00	4.6E+00	4.5E+00	4.4E+00	4.1E+00
280	64	1000	6.8E+00	6.1E+00	5.9E+00	5.7E+00	5.5E+00	5.3E+00	5.2E+00	5.1E+00	4.7E+00
290	74	1000	8.0E+00	7.3E+00	7.0E+00	6.8E+00	6.5E+00	6.3E+00	6.2E+00	6.0E+00	5.6E+00
300	86	1000	9.7E+00	8.9E+00	8.5E+00	8.3E+00	7.9E+00	7.7E+00	7.5E+00	7.3E+00	6.7E+00

Table A-10. Pressure dependence of the apparent molal enthalpy: $\frac{\phi_L}{RT}(P_2) - \frac{\phi_L}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	200	-2.2E-03	1.1E-03	8.3E-03	1.6E-02	2.4E-02	5.3E-02	7.8E-02	9.8E-02
30	1	200	-3.4E-03	-1.3E-03	4.2E-03	1.0E-02	1.7E-02	4.1E-02	6.3E-02	8.0E-02
40	1	200	-5.6E-03	-5.6E-03	-2.9E-03	6.4E-04	4.6E-03	2.1E-02	3.6E-02	4.8E-02
50	1	200	-7.9E-03	-9.5E-03	-9.3E-03	-7.8E-03	-5.8E-03	4.0E-03	1.4E-02	2.3E-02
60	1	200	-1.0E-02	-1.3E-02	-1.5E-02	-1.6E-02	-1.5E-02	-1.1E-02	-5.4E-03	-9.0E-05
70	1	200	-1.3E-02	-1.7E-02	-2.1E-02	-2.3E-02	-2.4E-02	-2.5E-02	-2.3E-02	-2.1E-02
80	1	200	-1.5E-02	-2.2E-02	-2.7E-02	-3.1E-02	-3.3E-02	-3.8E-02	-4.0E-02	-4.1E-02
90	1	200	-1.8E-02	-2.6E-02	-3.4E-02	-3.9E-02	-4.2E-02	-5.1E-02	-5.7E-02	-6.0E-02
100	1	200	-2.1E-02	-3.1E-02	-4.1E-02	-4.7E-02	-5.2E-02	-6.5E-02	-7.3E-02	-7.9E-02
110	1	200	-2.5E-02	-3.7E-02	-4.8E-02	-5.6E-02	-6.2E-02	-7.9E-02	-9.0E-02	-9.9E-02
120	2	200	-2.9E-02	-4.3E-02	-5.7E-02	-6.6E-02	-7.4E-02	-9.4E-02	-1.1E-01	-1.2E-01
130	3	200	-3.4E-02	-5.0E-02	-6.6E-02	-7.8E-02	-8.6E-02	-1.1E-01	-1.3E-01	-1.4E-01
140	4	200	-4.0E-02	-5.9E-02	-7.7E-02	-9.0E-02	-1.0E-01	-1.3E-01	-1.5E-01	-1.6E-01
150	5	200	-4.7E-02	-6.9E-02	-9.0E-02	-1.0E-01	-1.2E-01	-1.5E-01	-1.7E-01	-1.9E-01
160	6	200	-5.5E-02	-8.0E-02	-1.0E-01	-1.2E-01	-1.3E-01	-1.7E-01	-1.9E-01	-2.1E-01
170	8	200	-6.4E-02	-9.3E-02	-1.2E-01	-1.4E-01	-1.6E-01	-2.0E-01	-2.2E-01	-2.4E-01
180	10	200	-7.5E-02	-1.1E-01	-1.4E-01	-1.6E-01	-1.8E-01	-2.2E-01	-2.5E-01	-2.8E-01
190	13	200	-8.8E-02	-1.3E-01	-1.7E-01	-1.9E-01	-2.1E-01	-2.6E-01	-2.9E-01	-3.1E-01
200	16	200	-1.0E-01	-1.5E-01	-1.9E-01	-2.2E-01	-2.4E-01	-3.0E-01	-3.3E-01	-3.6E-01
210	19	200	-1.2E-01	-1.8E-01	-2.3E-01	-2.6E-01	-2.9E-01	-3.5E-01	-3.8E-01	-4.1E-01
220	23	200	-1.5E-01	-2.1E-01	-2.7E-01	-3.1E-01	-3.4E-01	-4.1E-01	-4.5E-01	-4.7E-01
230	28	200	-1.8E-01	-2.5E-01	-3.2E-01	-3.7E-01	-4.0E-01	-4.8E-01	-5.2E-01	-5.5E-01
240	33	200	-2.1E-01	-3.0E-01	-3.9E-01	-4.4E-01	-4.8E-01	-5.7E-01	-6.2E-01	-6.4E-01
250	40	200	-2.6E-01	-3.7E-01	-4.7E-01	-5.3E-01	-5.8E-01	-6.8E-01	-7.4E-01	-7.6E-01
260	47	200	-3.1E-01	-4.5E-01	-5.7E-01	-6.5E-01	-7.0E-01	-8.3E-01	-8.9E-01	-9.2E-01
270	55	200	-3.8E-01	-5.5E-01	-7.0E-01	-8.0E-01	-8.6E-01	-1.0E+00	-1.1E+00	-1.1E+00
280	64	200	-4.8E-01	-6.8E-01	-8.7E-01	-9.9E-01	-1.1E+00	-1.3E+00	-1.4E+00	-1.4E+00
290	74	200	-6.0E-01	-8.6E-01	-1.1E+00	-1.2E+00	-1.4E+00	-1.6E+00	-1.7E+00	-1.8E+00
300	86	200	-7.6E-01	-1.1E+00	-1.4E+00	-1.6E+00	-1.7E+00	-2.1E+00	-2.2E+00	-2.3E+00

Table A-10 (con't). Pressure dependence of the apparent molal enthalpy: $\frac{\phi_L}{RT}(P_2) - \frac{\phi_L}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	400	-3.9E-03	2.5E-03	1.7E-02	3.2E-02	4.7E-02	1.0E-01	1.5E-01	1.9E-01
30	1	400	-6.3E-03	-2.1E-03	8.6E-03	2.1E-02	3.3E-02	8.0E-02	1.2E-01	1.5E-01
40	1	400	-1.1E-02	-1.0E-02	-5.4E-03	1.6E-03	9.2E-03	4.0E-02	6.9E-02	9.2E-02
50	1	400	-1.5E-02	-1.8E-02	-1.8E-02	-1.5E-02	-1.1E-02	7.5E-03	2.6E-02	4.2E-02
60	1	400	-1.9E-02	-2.6E-02	-2.9E-02	-3.0E-02	-2.9E-02	-2.1E-02	-1.1E-02	-1.9E-03
70	1	400	-2.4E-02	-3.3E-02	-4.1E-02	-4.4E-02	-4.7E-02	-4.8E-02	-4.6E-02	-4.2E-02
80	1	400	-2.9E-02	-4.1E-02	-5.2E-02	-5.9E-02	-6.4E-02	-7.4E-02	-7.8E-02	-8.0E-02
90	1	400	-3.4E-02	-5.0E-02	-6.4E-02	-7.4E-02	-8.1E-02	-9.9E-02	-1.1E-01	-1.2E-01
100	1	400	-4.1E-02	-5.9E-02	-7.7E-02	-9.0E-02	-9.9E-02	-1.3E-01	-1.4E-01	-1.5E-01
110	1	400	-4.8E-02	-7.0E-02	-9.2E-02	-1.1E-01	-1.2E-01	-1.5E-01	-1.7E-01	-1.9E-01
120	2	400	-5.5E-02	-8.2E-02	-1.1E-01	-1.3E-01	-1.4E-01	-1.8E-01	-2.1E-01	-2.3E-01
130	3	400	-6.5E-02	-9.5E-02	-1.3E-01	-1.5E-01	-1.6E-01	-2.1E-01	-2.4E-01	-2.7E-01
140	4	400	-7.5E-02	-1.1E-01	-1.5E-01	-1.7E-01	-1.9E-01	-2.4E-01	-2.8E-01	-3.1E-01
150	5	400	-8.8E-02	-1.3E-01	-1.7E-01	-2.0E-01	-2.2E-01	-2.8E-01	-3.3E-01	-3.6E-01
160	6	400	-1.0E-01	-1.5E-01	-2.0E-01	-2.3E-01	-2.5E-01	-3.2E-01	-3.7E-01	-4.1E-01
170	8	400	-1.2E-01	-1.7E-01	-2.3E-01	-2.6E-01	-2.9E-01	-3.7E-01	-4.2E-01	-4.7E-01
180	10	400	-1.4E-01	-2.0E-01	-2.7E-01	-3.1E-01	-3.4E-01	-4.3E-01	-4.8E-01	-5.3E-01
190	13	400	-1.6E-01	-2.4E-01	-3.1E-01	-3.6E-01	-3.9E-01	-4.9E-01	-5.5E-01	-6.0E-01
200	16	400	-1.9E-01	-2.8E-01	-3.6E-01	-4.2E-01	-4.6E-01	-5.7E-01	-6.3E-01	-6.8E-01
210	19	400	-2.3E-01	-3.3E-01	-4.3E-01	-4.9E-01	-5.4E-01	-6.6E-01	-7.3E-01	-7.8E-01
220	23	400	-2.7E-01	-4.0E-01	-5.1E-01	-5.6E-01	-6.4E-01	-7.7E-01	-8.5E-01	-9.0E-01
230	28	400	-3.3E-01	-4.7E-01	-6.1E-01	-6.9E-01	-7.5E-01	-9.0E-01	-9.9E-01	-1.0E+00
240	33	400	-4.0E-01	-5.7E-01	-7.3E-01	-8.3E-01	-9.0E-01	-1.1E+00	-1.2E+00	-1.2E+00
250	40	400	-4.8E-01	-6.9E-01	-8.8E-01	-1.0E+00	-1.1E+00	-1.3E+00	-1.4E+00	-1.5E+00
260	47	400	-5.9E-01	-8.5E-01	-1.1E+00	-1.2E+00	-1.3E+00	-1.6E+00	-1.7E+00	-1.8E+00
270	55	400	-7.4E-01	-1.1E+00	-1.3E+00	-1.5E+00	-1.7E+00	-1.9E+00	-2.1E+00	-2.2E+00
280	64	400	-9.3E-01	-1.3E+00	-1.7E+00	-1.9E+00	-2.1E+00	-2.4E+00	-2.6E+00	-2.7E+00
290	74	400	-1.2E+00	-1.7E+00	-2.2E+00	-2.5E+00	-2.7E+00	-3.1E+00	-3.3E+00	-3.4E+00
300	86	400	-1.6E+00	-2.2E+00	-2.8E+00	-3.2E+00	-3.5E+00	-4.1E+00	-4.4E+00	-4.5E+00

Table A-10 (con't). Pressure dependence of the apparent molal enthalpy: $\frac{\phi_L}{RT}(P_2) - \frac{\phi_L}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	600	-5.4E-03	4.2E-03	2.5E-02	4.7E-02	6.9E-02	1.5E-01	2.2E-01	2.7E-01
30	1	600	-8.8E-03	-2.6E-03	1.3E-02	3.0E-02	4.8E-02	1.2E-01	1.7E-01	2.2E-01
40	1	600	-1.5E-02	-1.5E-02	-7.3E-03	2.7E-03	1.4E-02	5.8E-02	9.8E-02	1.3E-01
50	1	600	-2.1E-02	-2.6E-02	-2.5E-02	-2.1E-02	-1.6E-02	1.1E-02	3.6E-02	5.8E-02
60	1	600	-2.8E-02	-3.7E-02	-4.2E-02	-4.3E-02	-4.2E-02	-3.1E-02	-1.7E-02	-4.6E-03
70	1	600	-3.4E-02	-4.7E-02	-5.8E-02	-6.4E-02	-6.7E-02	-6.9E-02	-6.6E-02	-6.2E-02
80	1	600	-4.1E-02	-5.9E-02	-7.5E-02	-8.4E-02	-9.1E-02	-1.1E-01	-1.1E-01	-1.2E-01
90	1	600	-4.9E-02	-7.1E-02	-9.2E-02	-1.1E-01	-1.2E-01	-1.4E-01	-1.6E-01	-1.7E-01
100	1	600	-5.8E-02	-8.4E-02	-1.1E-01	-1.3E-01	-1.4E-01	-1.8E-01	-2.0E-01	-2.2E-01
110	1	600	-6.7E-02	-9.9E-02	-1.3E-01	-1.5E-01	-1.7E-01	-2.2E-01	-2.5E-01	-2.8E-01
120	2	600	-7.8E-02	-1.2E-01	-1.5E-01	-1.8E-01	-2.0E-01	-2.6E-01	-3.0E-01	-3.3E-01
130	3	600	-9.1E-02	-1.3E-01	-1.8E-01	-2.1E-01	-2.3E-01	-3.0E-01	-3.5E-01	-3.9E-01
140	4	600	-1.1E-01	-1.6E-01	-2.1E-01	-2.4E-01	-2.7E-01	-3.5E-01	-4.0E-01	-4.5E-01
150	5	600	-1.2E-01	-1.8E-01	-2.4E-01	-2.8E-01	-3.1E-01	-4.0E-01	-4.6E-01	-5.1E-01
160	6	600	-1.4E-01	-2.1E-01	-2.7E-01	-3.2E-01	-3.6E-01	-4.6E-01	-5.3E-01	-5.9E-01
170	8	600	-1.7E-01	-2.4E-01	-3.2E-01	-3.7E-01	-4.1E-01	-5.2E-01	-6.0E-01	-6.6E-01
180	10	600	-1.9E-01	-2.8E-01	-3.7E-01	-4.3E-01	-4.7E-01	-6.0E-01	-6.8E-01	-7.5E-01
190	13	600	-2.3E-01	-3.3E-01	-4.3E-01	-5.0E-01	-5.5E-01	-6.8E-01	-7.8E-01	-8.5E-01
200	16	600	-2.7E-01	-3.9E-01	-5.0E-01	-5.8E-01	-6.3E-01	-7.9E-01	-8.8E-01	-9.6E-01
210	19	600	-3.1E-01	-4.5E-01	-5.9E-01	-6.7E-01	-7.4E-01	-9.1E-01	-1.0E+00	-1.1E+00
220	23	600	-3.7E-01	-5.4E-01	-6.9E-01	-7.9E-01	-8.7E-01	-1.1E+00	-1.2E+00	-1.2E+00
230	28	600	-4.4E-01	-6.4E-01	-8.2E-01	-9.4E-01	-1.0E+00	-1.2E+00	-1.4E+00	-1.4E+00
240	33	600	-5.3E-01	-7.7E-01	-9.8E-01	-1.1E+00	-1.2E+00	-1.5E+00	-1.6E+00	-1.7E+00
250	40	600	-6.5E-01	-9.3E-01	-1.2E+00	-1.3E+00	-1.5E+00	-1.7E+00	-1.9E+00	-2.0E+00
260	47	600	-7.9E-01	-1.1E+00	-1.4E+00	-1.6E+00	-1.8E+00	-2.1E+00	-2.2E+00	-2.3E+00
270	55	600	-9.8E-01	-1.4E+00	-1.8E+00	-2.0E+00	-2.2E+00	-2.6E+00	-2.7E+00	-2.8E+00
280	64	600	-1.2E+00	-1.7E+00	-2.2E+00	-2.5E+00	-2.7E+00	-3.2E+00	-3.4E+00	-3.5E+00
290	74	600	-1.6E+00	-2.2E+00	-2.8E+00	-3.2E+00	-3.5E+00	-4.0E+00	-4.3E+00	-4.4E+00
300	86	600	-2.0E+00	-2.9E+00	-3.7E+00	-4.1E+00	-4.5E+00	-5.2E+00	-5.6E+00	-5.7E+00

Table A-10 (con't). Pressure dependence of the apparent molal enthalpy: $\frac{\phi_L}{RT}(P_2) - \frac{\phi_L}{RT}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	1000	-7.4E-03	7.8E-03	4.0E-02	7.4E-02	1.1E-01	2.3E-01	3.3E-01	4.1E-01
30	1	1000	-1.3E-02	-2.8E-03	2.2E-02	4.8E-02	7.6E-02	1.8E-01	2.6E-01	3.3E-01
40	1	1000	-2.3E-02	-2.2E-02	-1.0E-02	5.3E-03	2.2E-02	9.0E-02	1.5E-01	1.9E-01
50	1	1000	-3.2E-02	-3.9E-02	-3.8E-02	-3.1E-02	-2.3E-02	1.7E-02	5.4E-02	8.6E-02
60	1	1000	-4.2E-02	-5.5E-02	-6.3E-02	-6.4E-02	-6.3E-02	-4.7E-02	-2.7E-02	-8.9E-03
70	1	1000	-5.1E-02	-7.1E-02	-8.7E-02	-9.6E-02	-1.0E-01	-1.0E-01	-1.0E-01	-9.5E-02
80	1	1000	-6.2E-02	-8.8E-02	-1.1E-01	-1.3E-01	-1.4E-01	-1.6E-01	-1.7E-01	-1.8E-01
90	1	1000	-7.3E-02	-1.1E-01	-1.4E-01	-1.6E-01	-1.7E-01	-2.1E-01	-2.4E-01	-2.5E-01
100	1	1000	-8.6E-02	-1.3E-01	-1.6E-01	-1.9E-01	-2.1E-01	-2.7E-01	-3.0E-01	-3.3E-01
110	1	1000	-1.0E-01	-1.5E-01	-1.9E-01	-2.3E-01	-2.5E-01	-3.2E-01	-3.7E-01	-4.1E-01
120	2	1000	-1.2E-01	-1.7E-01	-2.3E-01	-2.6E-01	-2.9E-01	-3.8E-01	-4.4E-01	-4.9E-01
130	3	1000	-1.3E-01	-2.0E-01	-2.6E-01	-3.1E-01	-3.4E-01	-4.4E-01	-5.2E-01	-5.7E-01
140	4	1000	-1.5E-01	-2.3E-01	-3.0E-01	-3.5E-01	-3.9E-01	-5.1E-01	-5.9E-01	-6.6E-01
150	5	1000	-1.8E-01	-2.6E-01	-3.5E-01	-4.1E-01	-4.5E-01	-5.8E-01	-6.8E-01	-7.6E-01
160	6	1000	-2.1E-01	-3.0E-01	-4.0E-01	-4.6E-01	-5.2E-01	-6.7E-01	-7.7E-01	-8.6E-01
170	8	1000	-2.4E-01	-3.5E-01	-4.6E-01	-5.3E-01	-5.9E-01	-7.6E-01	-8.7E-01	-9.7E-01
180	10	1000	-2.8E-01	-4.0E-01	-5.3E-01	-6.1E-01	-6.8E-01	-8.6E-01	-9.9E-01	-1.1E+00
190	13	1000	-3.2E-01	-4.7E-01	-6.1E-01	-7.0E-01	-7.8E-01	-9.8E-01	-1.1E+00	-1.2E+00
200	16	1000	-3.7E-01	-5.4E-01	-7.0E-01	-8.1E-01	-9.0E-01	-1.1E+00	-1.3E+00	-1.4E+00
210	19	1000	-4.4E-01	-6.3E-01	-8.2E-01	-9.4E-01	-1.0E+00	-1.3E+00	-1.4E+00	-1.6E+00
220	23	1000	-5.1E-01	-7.4E-01	-9.6E-01	-1.1E+00	-1.2E+00	-1.5E+00	-1.6E+00	-1.8E+00
230	28	1000	-6.1E-01	-8.7E-01	-1.1E+00	-1.3E+00	-1.4E+00	-1.7E+00	-1.9E+00	-2.0E+00
240	33	1000	-7.2E-01	-1.0E+00	-1.3E+00	-1.5E+00	-1.6E+00	-2.0E+00	-2.2E+00	-2.3E+00
250	40	1000	-8.6E-01	-1.2E+00	-1.6E+00	-1.8E+00	-2.0E+00	-2.3E+00	-2.5E+00	-2.7E+00
260	47	1000	-1.0E+00	-1.5E+00	-1.9E+00	-2.2E+00	-2.3E+00	-2.8E+00	-3.0E+00	-3.1E+00
270	55	1000	-1.3E+00	-1.8E+00	-2.3E+00	-2.6E+00	-2.8E+00	-3.3E+00	-3.5E+00	-3.7E+00
280	64	1000	-1.6E+00	-2.2E+00	-2.8E+00	-3.2E+00	-3.5E+00	-4.0E+00	-4.3E+00	-4.4E+00
290	74	1000	-2.0E+00	-2.8E+00	-3.5E+00	-4.0E+00	-4.3E+00	-5.0E+00	-5.3E+00	-5.4E+00
300	86	1000	-2.5E+00	-3.5E+00	-4.5E+00	-5.1E+00	-5.5E+00	-6.3E+00	-6.7E+00	-6.8E+00

Table A-11. Pressure dependence of the apparent molal heat capacity: $\frac{{}^{\phi}C_p}{R}(P_2) - \frac{{}^{\phi}C_p}{R}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{C}^{\circ}_{p_2}}{R}$	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	200	2.1E+00	2.0E+00	1.9E+00	1.8E+00	1.7E+00	1.6E+00	1.4E+00	1.1E+00	9.9E-01
30	1	200	1.9E+00	1.8E+00	1.7E+00	1.7E+00	1.6E+00	1.5E+00	1.2E+00	1.0E+00	9.1E-01
40	1	200	1.6E+00	1.6E+00	1.5E+00	1.4E+00	1.3E+00	1.3E+00	1.1E+00	9.1E-01	8.0E-01
50	1	200	1.5E+00	1.4E+00	1.3E+00	1.3E+00	1.2E+00	1.2E+00	9.8E-01	8.4E-01	7.3E-01
60	1	200	1.4E+00	1.3E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	9.2E-01	7.9E-01	6.9E-01
70	1	200	1.4E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	1.0E+00	8.9E-01	7.6E-01	6.6E-01
80	1	200	1.4E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	1.0E+00	8.7E-01	7.5E-01	6.5E-01
90	1	200	1.4E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	1.0E+00	8.7E-01	7.5E-01	6.5E-01
100	1	200	1.5E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	1.0E+00	8.8E-01	7.6E-01	6.6E-01
110	1	200	1.5E+00	1.4E+00	1.3E+00	1.2E+00	1.1E+00	1.1E+00	9.0E-01	7.8E-01	6.7E-01
120	2	200	1.6E+00	1.4E+00	1.3E+00	1.2E+00	1.2E+00	1.1E+00	9.3E-01	8.0E-01	7.0E-01
130	3	200	1.8E+00	1.5E+00	1.4E+00	1.3E+00	1.2E+00	1.1E+00	9.7E-01	8.4E-01	7.4E-01
140	4	200	1.9E+00	1.6E+00	1.5E+00	1.4E+00	1.3E+00	1.2E+00	1.0E+00	8.9E-01	7.9E-01
150	5	200	2.2E+00	1.8E+00	1.6E+00	1.5E+00	1.4E+00	1.3E+00	1.1E+00	9.5E-01	8.5E-01
160	6	200	2.4E+00	2.0E+00	1.8E+00	1.6E+00	1.5E+00	1.4E+00	1.2E+00	1.0E+00	9.3E-01
170	8	200	2.8E+00	2.2E+00	2.0E+00	1.8E+00	1.6E+00	1.5E+00	1.3E+00	1.1E+00	1.0E+00
180	10	200	3.2E+00	2.5E+00	2.2E+00	2.0E+00	1.8E+00	1.7E+00	1.4E+00	1.2E+00	1.1E+00
190	13	200	3.7E+00	2.9E+00	2.5E+00	2.2E+00	2.0E+00	1.9E+00	1.5E+00	1.4E+00	1.3E+00
200	16	200	4.4E+00	3.4E+00	2.9E+00	2.5E+00	2.3E+00	2.1E+00	1.7E+00	1.5E+00	1.5E+00
210	19	200	5.3E+00	4.0E+00	3.4E+00	3.0E+00	2.6E+00	2.4E+00	2.0E+00	1.8E+00	1.7E+00
220	23	200	6.5E+00	4.8E+00	4.1E+00	3.5E+00	3.1E+00	2.9E+00	2.3E+00	2.0E+00	1.9E+00
230	28	200	8.0E+00	6.0E+00	5.1E+00	4.3E+00	3.8E+00	3.4E+00	2.7E+00	2.4E+00	2.3E+00
240	33	200	1.0E+01	7.5E+00	6.4E+00	5.3E+00	4.7E+00	4.2E+00	3.3E+00	2.9E+00	2.7E+00
250	40	200	1.3E+01	9.7E+00	8.2E+00	6.8E+00	6.0E+00	5.4E+00	4.0E+00	3.5E+00	3.3E+00
260	47	200	1.7E+01	1.3E+01	1.1E+01	8.9E+00	7.8E+00	6.9E+00	5.1E+00	4.4E+00	4.0E+00
270	55	200	2.3E+01	1.7E+01	1.4E+01	1.2E+01	1.0E+01	9.3E+00	6.7E+00	5.6E+00	5.0E+00
280	64	200	3.2E+01	2.4E+01	2.0E+01	1.6E+01	1.4E+01	1.3E+01	9.1E+00	7.3E+00	6.3E+00
290	74	200	4.5E+01	3.3E+01	2.8E+01	2.3E+01	2.0E+01	1.8E+01	1.3E+01	9.9E+00	8.3E+00
300	86	200	6.6E+01	4.9E+01	4.1E+01	3.4E+01	3.0E+01	2.6E+01	1.8E+01	1.4E+01	1.1E+01

Table A-11 (con't). Pressure dependence of the apparent molal heat capacity: $\frac{{}^{\phi}C_p}{R}(P_2) - \frac{{}^{\phi}C_p}{R}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{C}^{\circ}_{p_2}}{R}$	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	400	4.0E+00	3.8E+00	3.7E+00	3.5E+00	3.3E+00	3.1E+00	2.5E+00	2.1E+00	1.8E+00
30	1	400	3.6E+00	3.4E+00	3.3E+00	3.1E+00	3.0E+00	2.8E+00	2.3E+00	2.0E+00	1.7E+00
40	1	400	3.1E+00	3.0E+00	2.9E+00	2.7E+00	2.6E+00	2.4E+00	2.0E+00	1.7E+00	1.5E+00
50	1	400	2.8E+00	2.7E+00	2.6E+00	2.4E+00	2.3E+00	2.2E+00	1.9E+00	1.6E+00	1.4E+00
60	1	400	2.7E+00	2.5E+00	2.4E+00	2.3E+00	2.2E+00	2.1E+00	1.8E+00	1.5E+00	1.3E+00
70	1	400	2.6E+00	2.4E+00	2.3E+00	2.2E+00	2.1E+00	2.0E+00	1.7E+00	1.5E+00	1.3E+00
80	1	400	2.6E+00	2.4E+00	2.3E+00	2.2E+00	2.1E+00	2.0E+00	1.7E+00	1.4E+00	1.2E+00
90	1	400	2.7E+00	2.4E+00	2.3E+00	2.2E+00	2.1E+00	2.0E+00	1.7E+00	1.4E+00	1.2E+00
100	1	400	2.8E+00	2.5E+00	2.4E+00	2.2E+00	2.1E+00	2.0E+00	1.7E+00	1.4E+00	1.2E+00
110	1	400	2.9E+00	2.6E+00	2.4E+00	2.3E+00	2.1E+00	2.0E+00	1.7E+00	1.5E+00	1.3E+00
120	2	400	3.1E+00	2.7E+00	2.5E+00	2.3E+00	2.2E+00	2.1E+00	1.8E+00	1.5E+00	1.3E+00
130	3	400	3.4E+00	2.9E+00	2.7E+00	2.5E+00	2.3E+00	2.2E+00	1.8E+00	1.6E+00	1.4E+00
140	4	400	3.7E+00	3.1E+00	2.9E+00	2.6E+00	2.4E+00	2.3E+00	1.9E+00	1.7E+00	1.5E+00
150	5	400	4.0E+00	3.4E+00	3.1E+00	2.8E+00	2.6E+00	2.4E+00	2.1E+00	1.8E+00	1.6E+00
160	6	400	4.5E+00	3.7E+00	3.3E+00	3.0E+00	2.8E+00	2.6E+00	2.2E+00	1.9E+00	1.7E+00
170	8	400	5.1E+00	4.1E+00	3.7E+00	3.3E+00	3.0E+00	2.8E+00	2.4E+00	2.1E+00	1.9E+00
180	10	400	5.8E+00	4.6E+00	4.1E+00	3.6E+00	3.3E+00	3.1E+00	2.6E+00	2.3E+00	2.1E+00
190	13	400	6.7E+00	5.3E+00	4.6E+00	4.0E+00	3.7E+00	3.4E+00	2.8E+00	2.5E+00	2.3E+00
200	16	400	7.9E+00	6.1E+00	5.3E+00	4.6E+00	4.1E+00	3.8E+00	3.1E+00	2.8E+00	2.7E+00
210	19	400	9.4E+00	7.1E+00	6.2E+00	5.3E+00	4.7E+00	4.4E+00	3.5E+00	3.2E+00	3.0E+00
220	23	400	1.1E+01	8.5E+00	7.3E+00	6.2E+00	5.5E+00	5.1E+00	4.1E+00	3.7E+00	3.5E+00
230	28	400	1.4E+01	1.0E+01	8.8E+00	7.4E+00	6.6E+00	6.0E+00	4.7E+00	4.2E+00	4.1E+00
240	33	400	1.8E+01	1.3E+01	1.1E+01	9.1E+00	8.0E+00	7.2E+00	5.6E+00	5.0E+00	4.8E+00
250	40	400	2.3E+01	1.7E+01	1.4E+01	1.1E+01	1.0E+01	9.0E+00	6.8E+00	6.0E+00	5.7E+00
260	47	400	3.0E+01	2.2E+01	1.8E+01	1.5E+01	1.3E+01	1.1E+01	8.5E+00	7.4E+00	6.9E+00
270	55	400	4.0E+01	2.9E+01	2.4E+01	2.0E+01	1.7E+01	1.5E+01	1.1E+01	9.3E+00	8.6E+00
280	64	400	5.5E+01	4.0E+01	3.3E+01	2.7E+01	2.3E+01	2.1E+01	1.5E+01	1.2E+01	1.1E+01
290	74	400	7.9E+01	5.7E+01	4.7E+01	3.9E+01	3.3E+01	2.9E+01	2.0E+01	1.6E+01	1.4E+01
300	86	400	1.2E+02	8.4E+01	7.0E+01	5.7E+01	4.9E+01	4.3E+01	2.9E+01	2.3E+01	1.9E+01

Table A-11 (con't). Pressure dependence of the apparent molal heat capacity: $\frac{^{\phi}C_p}{R}(P_2) - \frac{^{\phi}C_p}{R}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{C}^{\circ}_{p_2}}{R}$	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	600	5.6E+00	5.4E+00	5.2E+00	4.9E+00	4.6E+00	4.4E+00	3.6E+00	3.0E+00	2.6E+00
30	1	600	5.1E+00	4.9E+00	4.7E+00	4.5E+00	4.2E+00	4.0E+00	3.3E+00	2.7E+00	2.4E+00
40	1	600	4.4E+00	4.2E+00	4.1E+00	3.8E+00	3.6E+00	3.5E+00	2.9E+00	2.4E+00	2.1E+00
50	1	600	4.1E+00	3.8E+00	3.7E+00	3.5E+00	3.3E+00	3.2E+00	2.6E+00	2.2E+00	2.0E+00
60	1	600	3.9E+00	3.6E+00	3.5E+00	3.3E+00	3.1E+00	3.0E+00	2.5E+00	2.1E+00	1.9E+00
70	1	600	3.8E+00	3.5E+00	3.3E+00	3.2E+00	3.0E+00	2.9E+00	2.4E+00	2.1E+00	1.8E+00
80	1	600	3.8E+00	3.5E+00	3.3E+00	3.1E+00	3.0E+00	2.8E+00	2.4E+00	2.0E+00	1.8E+00
90	1	600	3.8E+00	3.5E+00	3.3E+00	3.1E+00	2.9E+00	2.8E+00	2.4E+00	2.0E+00	1.8E+00
100	1	600	4.0E+00	3.6E+00	3.4E+00	3.2E+00	3.0E+00	2.8E+00	2.4E+00	2.1E+00	1.8E+00
110	1	600	4.2E+00	3.7E+00	3.5E+00	3.2E+00	3.1E+00	2.9E+00	2.5E+00	2.1E+00	1.8E+00
120	2	600	4.4E+00	3.9E+00	3.6E+00	3.3E+00	3.2E+00	3.0E+00	2.5E+00	2.2E+00	1.9E+00
130	3	600	4.8E+00	4.1E+00	3.8E+00	3.5E+00	3.3E+00	3.1E+00	2.6E+00	2.3E+00	2.0E+00
140	4	600	5.2E+00	4.4E+00	4.0E+00	3.7E+00	3.5E+00	3.3E+00	2.8E+00	2.4E+00	2.1E+00
150	5	600	5.7E+00	4.7E+00	4.3E+00	3.9E+00	3.7E+00	3.5E+00	2.9E+00	2.5E+00	2.2E+00
160	6	600	6.3E+00	5.2E+00	4.7E+00	4.2E+00	3.9E+00	3.7E+00	3.1E+00	2.7E+00	2.4E+00
170	8	600	7.0E+00	5.7E+00	5.1E+00	4.6E+00	4.2E+00	4.0E+00	3.3E+00	2.9E+00	2.6E+00
180	10	600	8.0E+00	6.4E+00	5.7E+00	5.0E+00	4.6E+00	4.3E+00	3.6E+00	3.2E+00	2.9E+00
190	13	600	9.1E+00	7.2E+00	6.3E+00	5.6E+00	5.1E+00	4.7E+00	3.9E+00	3.5E+00	3.2E+00
200	16	600	1.1E+01	8.2E+00	7.2E+00	6.2E+00	5.6E+00	5.2E+00	4.3E+00	3.9E+00	3.6E+00
210	19	600	1.3E+01	9.5E+00	8.2E+00	7.1E+00	6.4E+00	5.9E+00	4.8E+00	4.3E+00	4.1E+00
220	23	600	1.5E+01	1.1E+01	9.6E+00	8.2E+00	7.3E+00	6.7E+00	5.4E+00	4.9E+00	4.6E+00
230	28	600	1.8E+01	1.3E+01	1.1E+01	9.6E+00	8.5E+00	7.8E+00	6.2E+00	5.6E+00	5.3E+00
240	33	600	2.3E+01	1.6E+01	1.4E+01	1.2E+01	1.0E+01	9.2E+00	7.2E+00	6.4E+00	6.2E+00
250	40	600	2.8E+01	2.1E+01	1.7E+01	1.4E+01	1.2E+01	1.1E+01	8.5E+00	7.6E+00	7.3E+00
260	47	600	3.7E+01	2.6E+01	2.2E+01	1.6E+01	1.5E+01	1.4E+01	1.0E+01	9.1E+00	8.7E+00
270	55	600	4.9E+01	3.5E+01	2.9E+01	2.3E+01	2.0E+01	1.8E+01	1.3E+01	1.1E+01	1.1E+01
280	64	600	6.6E+01	4.7E+01	3.9E+01	3.1E+01	2.7E+01	2.4E+01	1.7E+01	1.4E+01	1.3E+01
290	74	600	9.2E+01	6.5E+01	5.4E+01	4.4E+01	3.7E+01	3.2E+01	2.2E+01	1.8E+01	1.7E+01
300	86	600	1.3E+02	9.5E+01	7.8E+01	6.3E+01	5.4E+01	4.7E+01	3.2E+01	2.5E+01	2.2E+01

Table A-11 (con't). Pressure dependence of the apparent molal heat capacity: $\frac{{}^{\phi}C_p}{R}(P_2) - \frac{{}^{\phi}C_p}{R}(P_1)$

TEMP (°C)	P1 (BAR)	P2 (BAR)	$\frac{\bar{C}^{\circ}_{p_2}}{R}$	MOLALITY .100	.250	.500	.750	1.000	2.000	3.000	4.000
25	1	1000	8.3E+00	8.0E+00	7.6E+00	7.2E+00	6.8E+00	6.4E+00	5.1E+00	4.2E+00	3.6E+00
30	1	1000	7.6E+00	7.3E+00	7.0E+00	6.5E+00	6.2E+00	5.8E+00	4.7E+00	3.9E+00	3.4E+00
40	1	1000	6.6E+00	6.3E+00	6.0E+00	5.7E+00	5.4E+00	5.1E+00	4.2E+00	3.5E+00	3.1E+00
50	1	1000	6.1E+00	5.7E+00	5.5E+00	5.2E+00	4.9E+00	4.7E+00	3.9E+00	3.3E+00	2.9E+00
60	1	1000	5.8E+00	5.4E+00	5.2E+00	4.9E+00	4.6E+00	4.4E+00	3.7E+00	3.2E+00	2.8E+00
70	1	1000	5.7E+00	5.3E+00	5.0E+00	4.7E+00	4.5E+00	4.3E+00	3.6E+00	3.1E+00	2.7E+00
80	1	1000	5.6E+00	5.2E+00	4.9E+00	4.7E+00	4.4E+00	4.2E+00	3.6E+00	3.1E+00	2.7E+00
90	1	1000	5.7E+00	5.2E+00	5.0E+00	4.7E+00	4.4E+00	4.2E+00	3.6E+00	3.1E+00	2.7E+00
100	1	1000	5.9E+00	5.3E+00	5.0E+00	4.7E+00	4.5E+00	4.3E+00	3.6E+00	3.1E+00	2.7E+00
110	1	1000	6.2E+00	5.5E+00	5.2E+00	4.8E+00	4.6E+00	4.3E+00	3.7E+00	3.2E+00	2.7E+00
120	2	1000	6.5E+00	5.8E+00	5.4E+00	5.0E+00	4.7E+00	4.5E+00	3.8E+00	3.3E+00	2.8E+00
130	3	1000	7.0E+00	6.1E+00	5.6E+00	5.2E+00	4.9E+00	4.6E+00	3.9E+00	3.4E+00	2.9E+00
140	4	1000	7.5E+00	6.5E+00	6.0E+00	5.5E+00	5.1E+00	4.9E+00	4.1E+00	3.5E+00	3.1E+00
150	5	1000	8.2E+00	6.9E+00	6.4E+00	5.8E+00	5.4E+00	5.1E+00	4.3E+00	3.7E+00	3.3E+00
160	6	1000	9.0E+00	7.5E+00	6.8E+00	6.2E+00	5.8E+00	5.4E+00	4.6E+00	4.0E+00	3.5E+00
170	8	1000	1.0E+01	8.2E+00	7.4E+00	6.7E+00	6.2E+00	5.8E+00	4.9E+00	4.3E+00	3.8E+00
180	10	1000	1.1E+01	9.1E+00	8.1E+00	7.2E+00	6.7E+00	6.2E+00	5.2E+00	4.6E+00	4.1E+00
190	13	1000	1.3E+01	1.0E+01	9.0E+00	7.9E+00	7.3E+00	6.8E+00	5.6E+00	5.0E+00	4.5E+00
200	16	1000	1.5E+01	1.1E+01	1.0E+01	8.7E+00	8.0E+00	7.4E+00	6.1E+00	5.5E+00	5.0E+00
210	19	1000	1.7E+01	1.3E+01	1.1E+01	9.8E+00	8.8E+00	8.2E+00	6.7E+00	6.0E+00	5.6E+00
220	23	1000	2.0E+01	1.5E+01	1.3E+01	1.1E+01	9.9E+00	9.1E+00	7.4E+00	6.7E+00	6.3E+00
230	28	1000	2.4E+01	1.7E+01	1.5E+01	1.3E+01	1.1E+01	1.0E+01	8.3E+00	7.5E+00	7.2E+00
240	33	1000	2.8E+01	2.1E+01	1.8E+01	1.5E+01	1.3E+01	1.2E+01	9.4E+00	8.5E+00	8.2E+00
250	40	1000	3.5E+01	2.5E+01	2.1E+01	1.7E+01	1.5E+01	1.4E+01	1.1E+01	9.7E+00	9.5E+00
260	47	1000	4.4E+01	3.1E+01	2.6E+01	2.1E+01	1.8E+01	1.6E+01	1.3E+01	1.1E+01	1.1E+01
270	55	1000	5.7E+01	4.0E+01	3.3E+01	2.7E+01	2.3E+01	2.0E+01	1.5E+01	1.3E+01	1.3E+01
280	64	1000	7.5E+01	5.2E+01	4.3E+01	3.4E+01	2.9E+01	2.6E+01	1.9E+01	1.6E+01	1.6E+01
290	74	1000	1.0E+02	7.1E+01	5.8E+01	4.6E+01	3.9E+01	3.4E+01	2.4E+01	2.0E+01	1.9E+01
300	86	1000	1.4E+02	1.0E+02	8.1E+01	6.4E+01	5.4E+01	4.7E+01	3.2E+01	2.6E+01	2.4E+01

Figure Captions

Figure 1. Comparison of data of Hilbert [4], and Zarembo and Federov [24]. The plotted values are for $(\frac{\partial v}{\partial T})_{P,m} \times 10^5$ (cm^3 g^{-1} K^{-1}) at 5.5 molal, calculated from the volumetric data as the finite difference over a 50 K interval. Values from Gibson and Loeffler [15] are taken directly from their tables.

Figure 2. Comparison of expansivity values for NaCl solutions at 25°C. Solid lines represent values of $(\frac{\partial v}{\partial T})_{P,m} \times 10^4$ (cm^3 g^{-1} K^{-1}) calculated from the volumetric fit. Points are from the tables of Gibson and Loeffler [15].

Figure 3. Comparison of compressibility values for NaCl solutions at 25°C. Solid lines represent values of $-(\frac{\partial v}{\partial P})_{T,m} \times 10^5$ (cm^3 g^{-1} bar^{-1}) calculated from the volumetric fit. Points are from the tables of Gibson and Loeffler [15].

Figure 4. Fitting parameter $\frac{V(m_1)}{m_1}$ as a function of temperature.

Figure 5. Fitting parameter B^v_{MX} as a function of temperature.

Figure 6. Fitting parameter C^v_{MX} as a function of temperature.

Figure 7. The apparent molal volume at infinite dilution, $\bar{V}^\circ_2$, for NaCl solutions as a function of temperature.

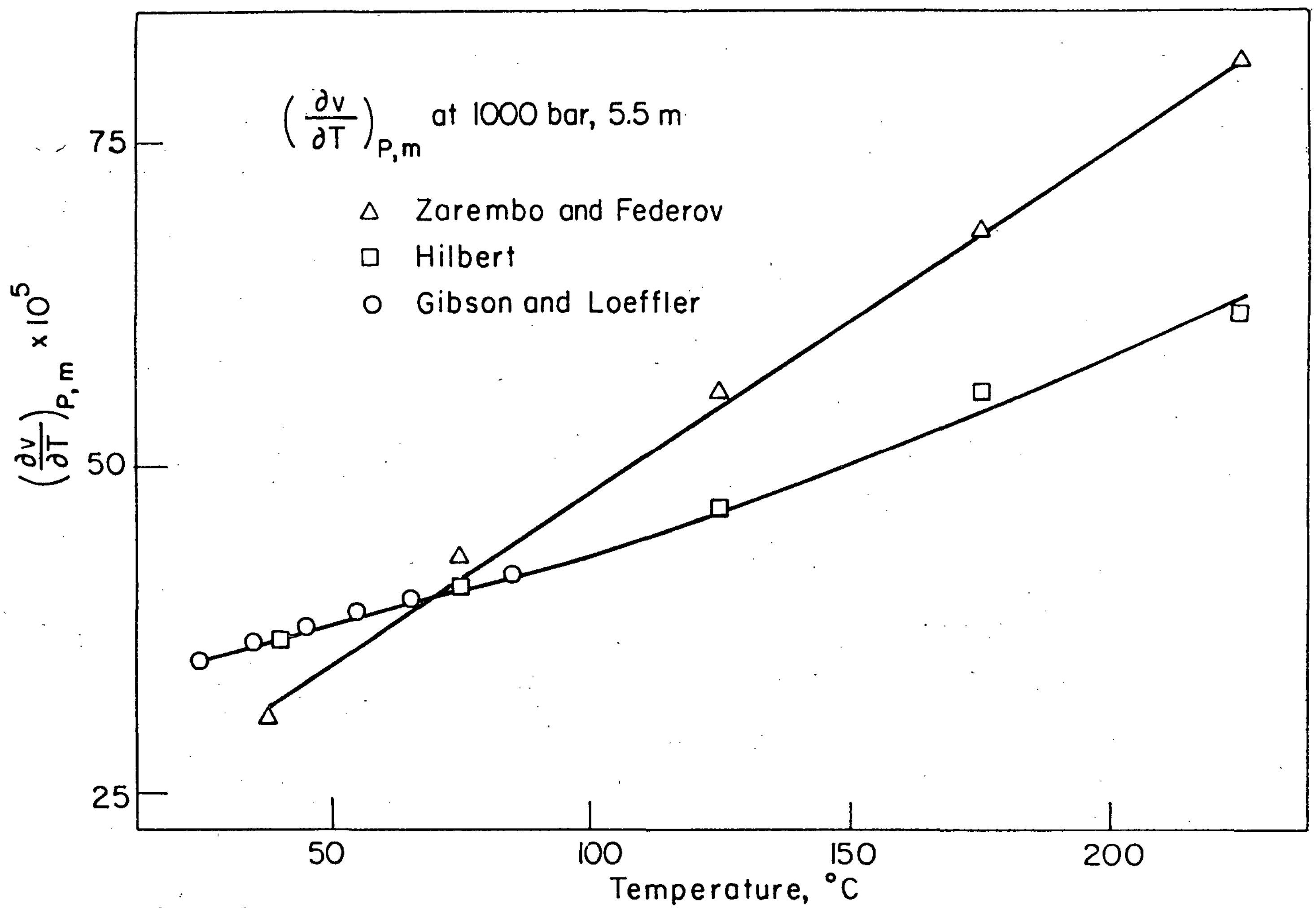

Figure 1

XBL 812-5192

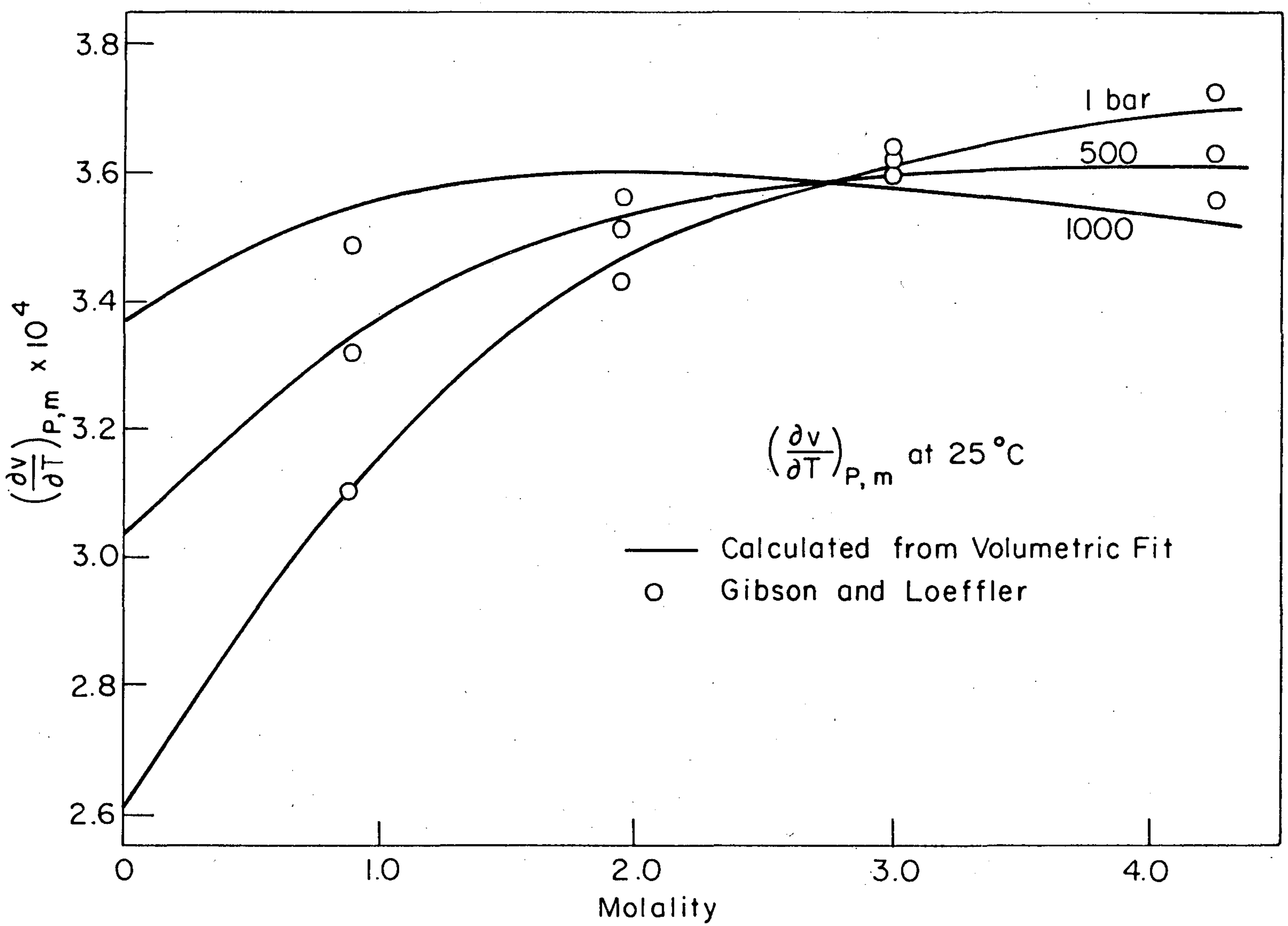

Figure 2

XBL 812-5193

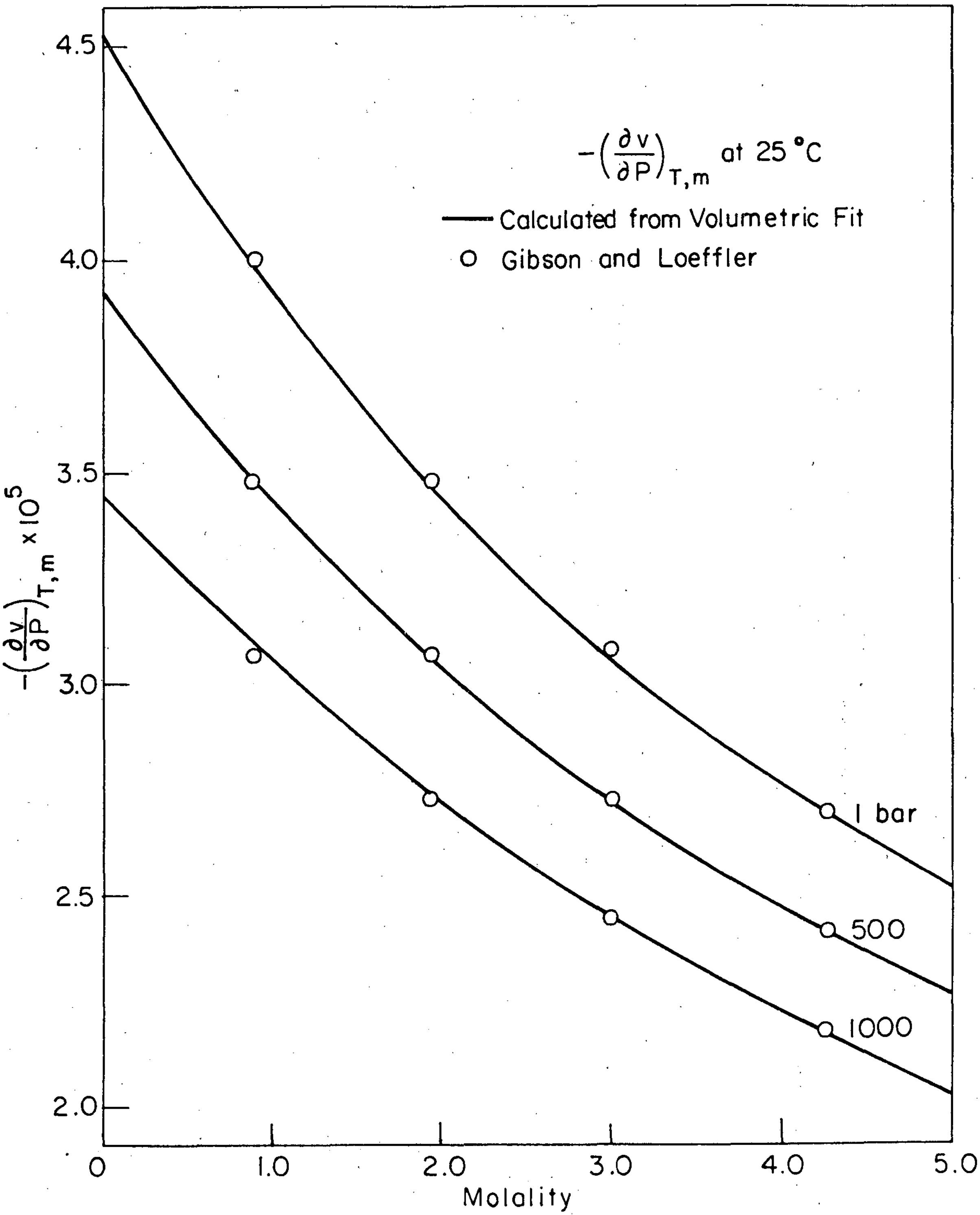

Figure 3

XBL 812-5189

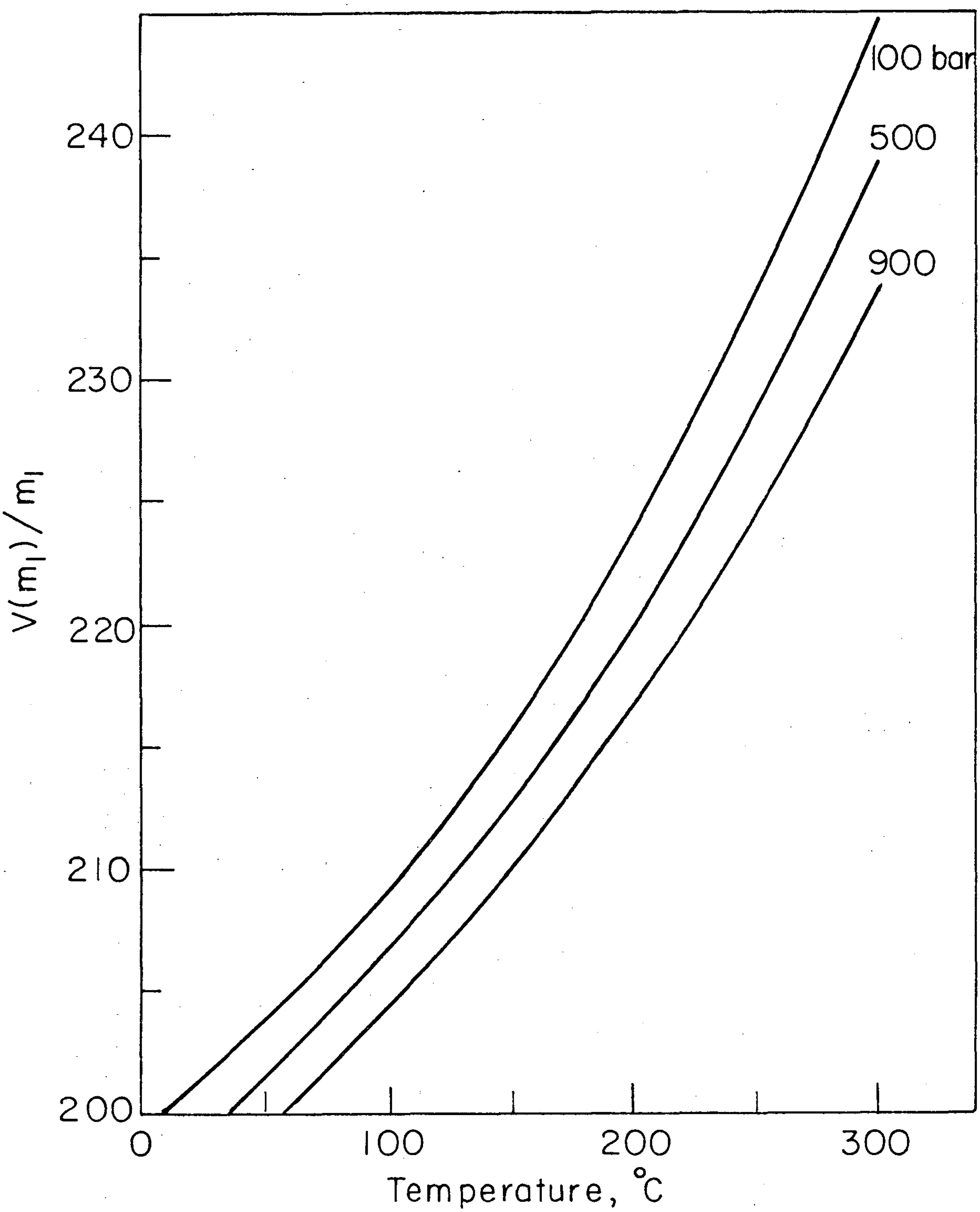

Figure 4

XBL 812-5186

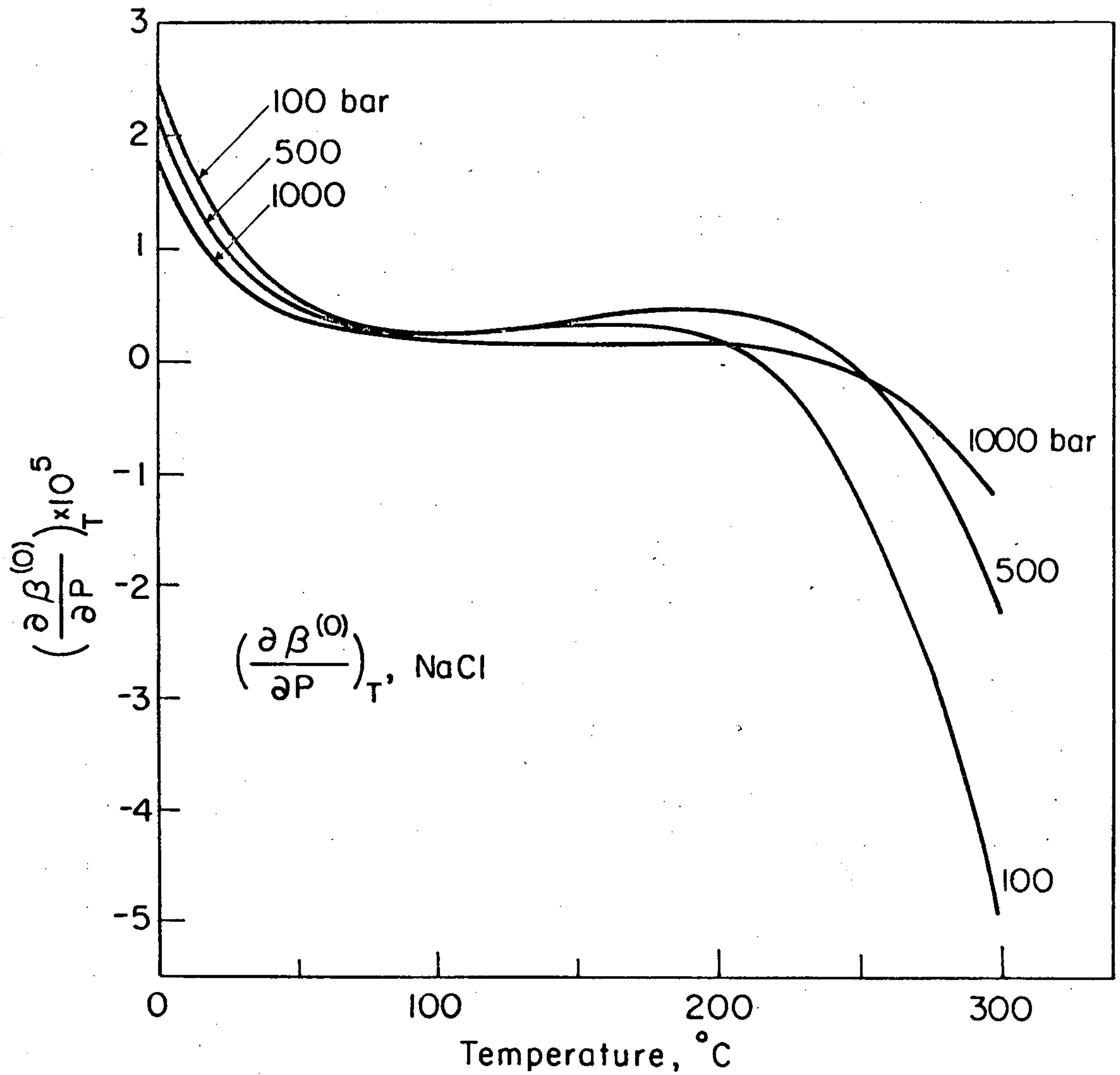

Figure 5

XBL 812-5172

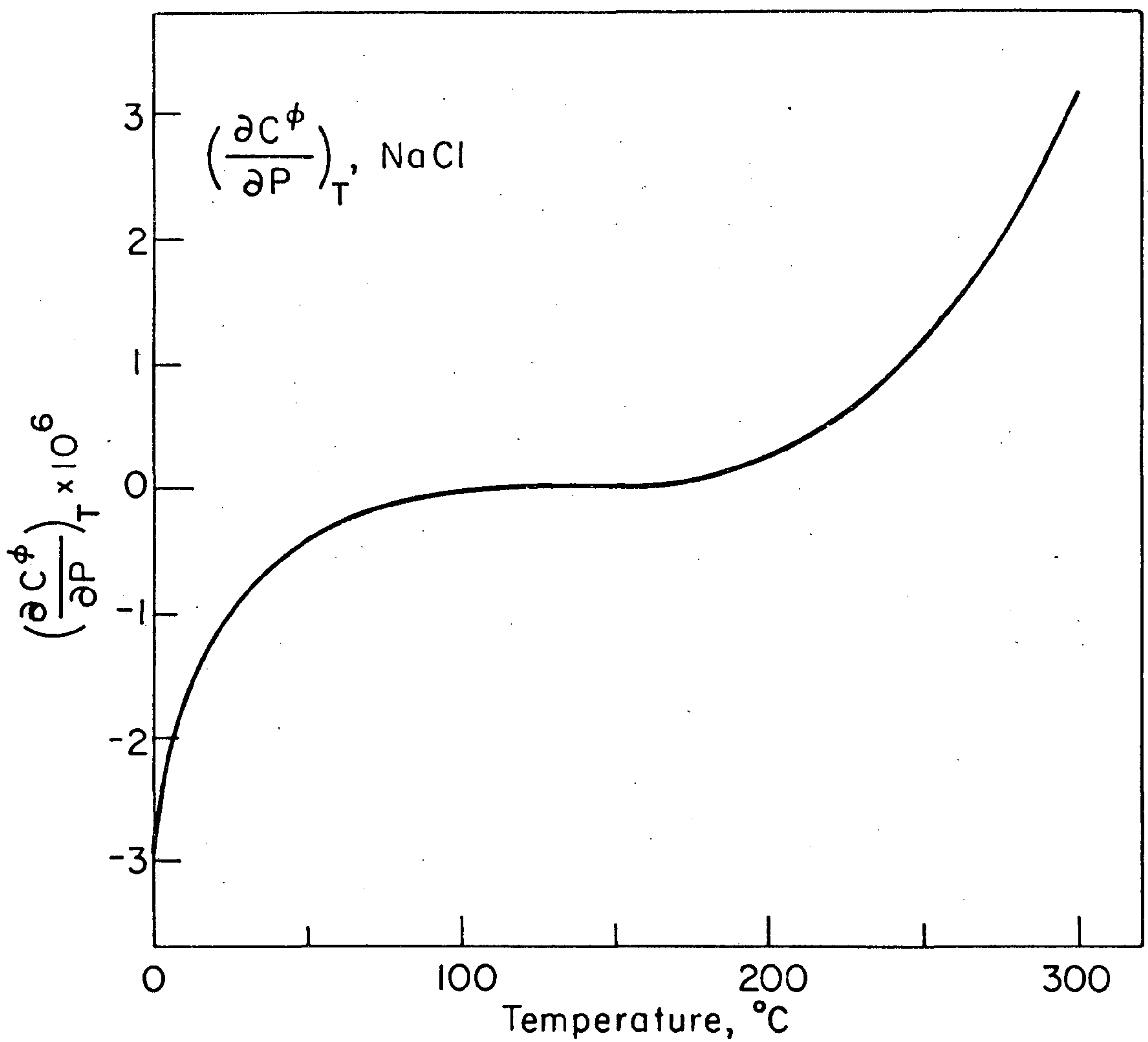

Figure 6

XBL 812-5173

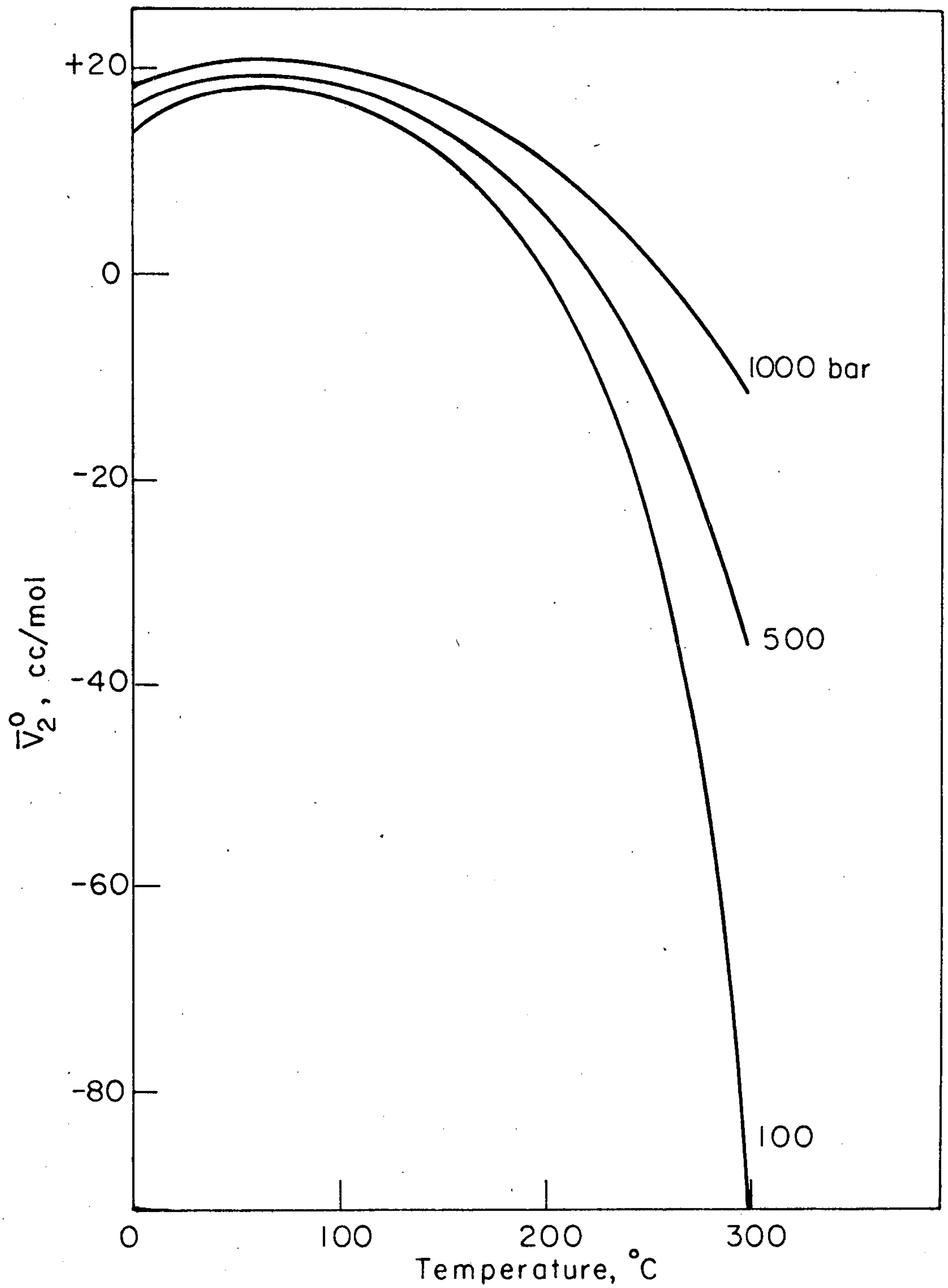

Figure 7

XBL 812-5187

TECHNICAL INFORMATION DEPARTMENT
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA 94720