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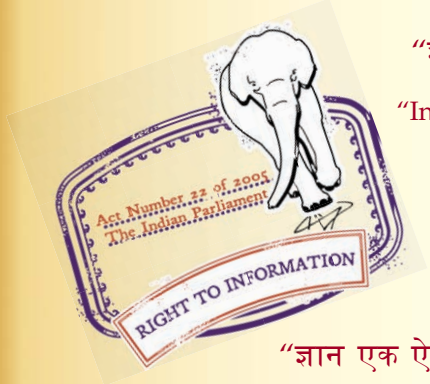
IS 3506 (1989): Tables for Alcoholometry (Pyknometer Method) [PCD 9: Organic Chemicals Alcohols and Allied Products and Dye Intermediates]



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"Knowledge is such a treasure which cannot be stolen"

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IS 3506 : 1989
(Reaffirmed 2005)

Indian Standard

TABLES FOR ALCOHOLOMETRY (PYKNOMETER METHOD)

(First Revision)

UDC 661·72 : 531·756·4 (083·3)

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1991 Gr 15

Indian Standard

TABLES FOR ALCOHOLOMETRY (PYKNOMETER METHOD)

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 15 January 1989, after the draft finalized by the Alcohols and Allied Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 The Alcohols and Allied Products Sectional Committee on a review of IS : 3506-1967 'Tables for alcoholometry by pyknometer method' noted the practical difficulties in the old French Tables, 'Guide Pratique D'Alcoometrie 1950', now superseded by highly accurate data from International Organization of Legal Metrology, OIML Tables and based on these data the new French Tables 'Guide Pratique D'Alcoometrie, 1980'. Apart from this, the use of tables in IS : 3506-1967 very much depended on the accuracy of the pyknometer which could not be taken for granted. In view of this, the basis of these tables, that is, $t°/15°C$ measurements, has been modified to $t°/t°$ measurements in the present standard, as in the Alcoholometric Tables of the Association of Official Analytical Chemists, USA, and also brought up-to-data in accuracy to that of OIML data. The apparent (that is, in air and not vacuum) specific gravity $t°/t°$ measurements incorporated in this standard are shown to be practically independent of the pyknometer accuracy (*see* **5.2**).

0.3 Ethanol content of alcoholic liquids and their preparations may be assayed on the basis of density, refractive index, oxidation, gas chromatography, etc. The determination of volumetric content of ethanol at 20°C in an ethanol-water mixture at t°C by centesimal hydrometer is covered by IS : 2302-1989*.

By immersion of the centesimal hydrometer into the alcoholic liquid contained in a glass cylinder, the observed degree at the prevailing temperature is obtained and by referring to the alcoholometric table, the percentage by volume of ethanol at 20°C is obtained in the alcoholic liquid at t°C (alcohol richness $20°/t°$) or at 20°C (real strength $20°/20°$) as may be required. A sufficient volume of the alcoholic liquid is necessary for the use of hydrometer.

0.3.1 The centesimal hydrometers could not be employed when the quantity of alcoholic preparations available for test is small, say 100 to 200 ml. This happens in the case of alcoholic preparations, such as, perfumes, medicinal and toilet preparations. Also, as per Excise rules, in the case of disputed 'hydrometer strength', the 'distillation strength', that is the alcoholic strength of the distillate, ordinarily obtained by pyknometer method, should always be accepted as the correct strength. It becomes necessary, therefore, to determine the specific gravity of the alcoholic liquid in question using a pyknometer.

0.4 The pyknometer tables included in this standard comprise of two tables, namely Table 1 and Table 2. The former has been constructed from the data from OIML (International Organization of Legal Metrology). The OIML data is based on collaborative measurements on ethyl alcohol-water mixtures by US National Bureau of Standards; National Bureau of Quality and Measures, Poland; National Research Laboratory of Metrology, Japan; Montpellier Faculty of Pharmacy, France, Physikalisch Technische Bundesanstalt, F. R. Germany; and International Union of Pure and Applied Chemistry. Table 2 has also been computed from the OIML data.

0.5 In reporting the result of a test made in accordance with this standard, if the final value observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

*Tables for alcoholometry (*first revision*).

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers two tables. Pyknometer tables (Table 1) give the apparent specific gravity or apparent relative density, $t°/t°$, measured in air using 50 ml capacity pyknometer, that is, apparent mass of alcoholic liquid at t°C/apparent mass of water at t°C, against the ethanolic content at 20°C in the alcoholic liquid at 20°C that is real strength 20°/20° or volume percent of ethanol at 20°C. Table 2 gives the minor corrections for conversion of ethanolic real strength at 20°C to that at 15°C or 15·56°C which may be required under the present Excise Rules until the international system of real strength at 20°C is adopted for excise purposes in our country.

1.1.1 Though the Indian ambient temperatures vary greatly from 20°C, the OIML data which has been utilized in constructing these pyknometer tables, allow for apparent specific gravity measurements to be carried out in the entire temperature range of relevance here, namely 10 to 40°C, without sacrificing the ultimate accuracy of the results achieved through the OIML data.

2. TERMINOLOGY

2.0 For the purpose of this standard, besides the definitions given in IS : 2302-1987*, the following shall also apply.

2.1 Apparent Relative Density (Apparent Specific Gravity)—It is the relative density/specific gravity in air obtained by the pyknometer method at t°C with respect to water at t°C.

2.2 Single Bulk Method — When a measured volume, say 100 ml, of a spirituous preparation is diluted and distilled to collect the same volume of distillate, that is 100 ml, it is referred to as the single bulk method.

2.3 Double Bulk Method — When a measured volume, say 50 ml, of a spirituous preparation is diluted and distilled to collect distillate twice the original volume of the sample, that is 100 ml, it is referred to as the double bulk method.

2.4 Treble Bulk Method — When a measured volume, say 25 ml, of a spirituous preparation is diluted and distilled to collect thrice the volume of the sample, that is 75 ml, it is referred to as treble bulk method.

2.5 Quadruple Bulk Method — When a measured volume, say 25 ml, of a spirituous preparation is diluted and distilled to collect four times the volume of the sample, that is 100 ml, it is referred to as quadruple bulk method.

*Tables for alcoholometry (*first revision*).

3 DETERMINATION OF ETHANOL CONTENT OF A SPIRITUOUS PREPARATION

3.0 General — Ethanol content of a spirituous preparation can be quantitatively determined by specific gravity determination. However, prior to this determination, ethanol contained in the preparation as a rule, has to be obtained practically free from all other dissolved and undissolved substances except water. Simple direct distillation suffices where the admixed or dissolved ingredients are not volatile with steam. When volatile bodies are present, it is necessary either to render them incapable of distillation or to remove them. All spirituous preparations containing volatile acids or ammonia (or amines) are neutralized by an alkali or acid (sodium hodroxide or sulphuric acid). Free iodine, if present, may first be converted into sodium iodide by treatment with sodium thiosulphate. Volatile oils, solvents, etc, are removed by adopting the single, double, treble or quadruple bulk method as described in **3.3**. Through the use of any of these methods, a definite volume of the distillate is collected and its specific gravity determined by pyknometer method. Through suitable use of Table 1 and Table 2, ethanol content of spirituous preparation is determined.

NOTE — On account of the high vapour pressure of ethyl alcohol and its affinity for water, the distillation of a concentrated spirituous preparation into its own volume of water (single bulk method) so as to obtain an accurate determination of the amount of alcohol present is practically impossible with the apparatus and methods commonly used. Consequently double, treble and quadruple bulks are generally used. As regards the extent of dilution, it has been found that alcohol in 25 ml of concentrated spirituous preparation when diluted with water even to the extent of 500 ml and the solution saturated with salt could be entirely removed in the first 100 ml of the distillate. In the case of low concentration spirituous preparations (under 20 percent alcohol), the single bulk method is normally employed.

3.1 Apparatus

3.1.1 *Distillation Assembly* — The assembly shown in Fig. 1 is employed. The condenser nozzle at the distillate end is attached to a delivery tube by means of a rubber tubing. The lower part of this delivery tube reaches the bottom of the receiver (100 ml volumetric flask) where it is dipped into the minimum quantity of distilled water.

3.1.2 *Receiver* — 100 ml capacity volumetric flask.

3.1.3 *Pyknometer* — as shown in Fig. 2, 50 ml capacity.

3.1.4 *Thermometers* — with the range of 0 to 50°C with sub-divisions at every 0·5°C.

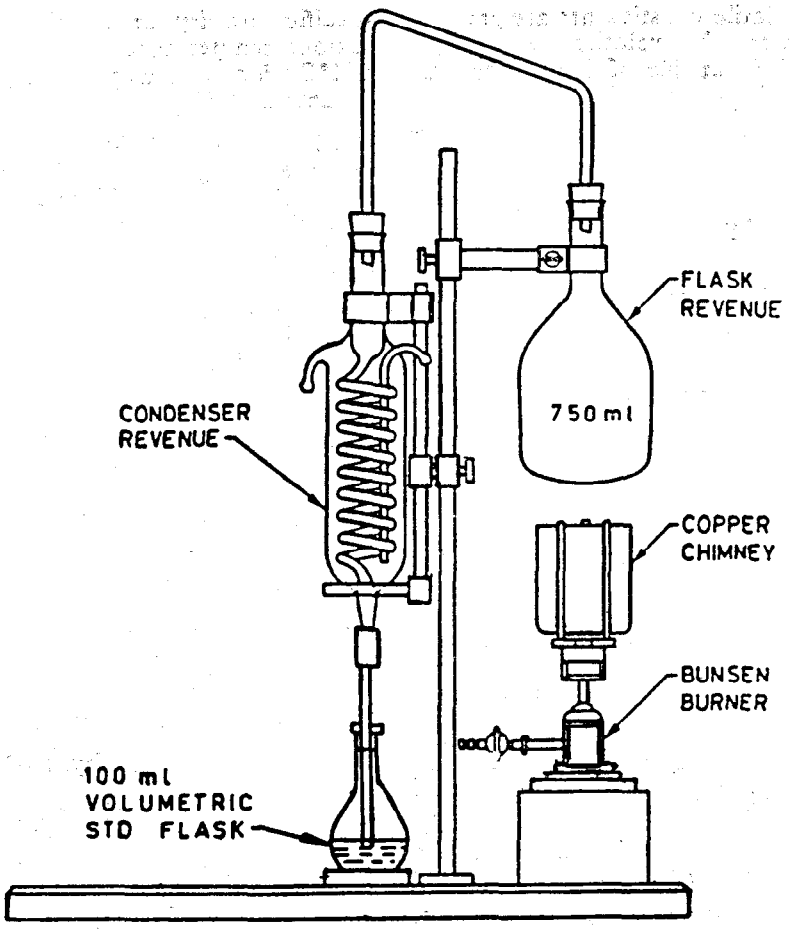

FIG. 1 DISTILLATION ASSEMBLY

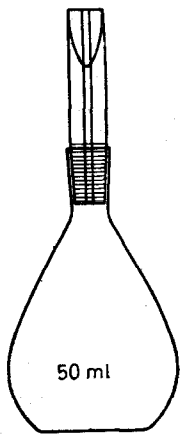

FIG. 2 PYKNOMETER
(CAPILLARY STOPPERED)

3.1.5 Distillation assembly may be modified in respect of standard joint apparatus including 500 ml flask in place of revenue flask, modified gas or electric heating, generally in line with IS : 5298-1983*but these should be used only if the results are comparable with the revenue distillation assembly described in **3.1.1.** In case of disputed alcoholic strength, the alcoholic strength of the sample obtained by using revenue distillation assembly should be taken as the correct strength.

3.2 Reagents

3.2.1 *Common Salt — See* IS : 797-1982*.

3.2.2 *Petroleum Hydrocarbon Solvent 60/80 — See* IS : 1745-1978†.

3.3 Procedure

3.3.1 Where the spirituous preparations contain admixed or dissolved ingredients which are not volatile, direct distillation using single, double, treble or quadruple methods shall be used.

*Methods for determination of distillation range and of distillation yield (*first revision*).

*Specification for common salt for chemical industries (*third revision*).

†Specification for petroleum hydrocarbon solvent (*second revision*).

3.3.2 Where volatile constituents are present, prior to distillation, the volatile constituents shall be rendered incapable of distillation. All spirituous preparations containing volatile acids or ammonia (or amines) shall be neutralized by alkali or acids (sodium hydroxide or sulphuric acid, as the case may be) prior to distillation. If free iodine is present, convert it into sodium iodide by treatment with sodium thiosulphate.

3.3.3 Where volatile oils, solvent, etc, are present, the following procedure shall be followed :

Take 100 ml (or 50 or 25 ml) depending on whether single, double or quadruple methods are to be used, of the sample measured at air temperature t°C. Wash the sample into a separator and make up the volume to 100 ml to 125 ml, add enough common salt to saturate the liquid and shake vigorously for about 5 minutes with 50 to 80 ml of petroleum hydrocarbon solvent. Allow to stand for 15 to 20 minutes after which the petroleum hydrocarbon solvent shall be completely separated carrying with it the oily matter. Draw off the lower saline alcohol layer into the distillation assembly. Wash petroleum layer twice with saturated sodium chloride solution (about 10 ml) and transfer saline washings also to the distillation flask. Neutralize, if necessary, and distil to collect 100 ml of distillate at t°C.

3.3.4 Where non-volatile dissolved or admixed ingredients and also volatile oils, solvent, etc, are present, resort to procedure as described under 3.3 (followed by that in 3.3.3).

3.3.5 *Determination of Specific Gravity* — When several tests are carried out, rinse the interior of the pyknometer after each test so that the provious liquid which has wetted the sides of the pyknometer may not alter the density of the liquid under test.

Fill the pyknometer with the alcoholic liquid brought to room temperature. Measure the temperature of the liquid. Then weigh the pyknometer with the alcoholic liquid thus filled at t°C. Calculate the net mass in air of the alcoholic liquid at t°C in the pyknometer by subtracting the mass of the empty pyknometer. Divide the mass so obtained by the mass in air of 50 ml of water in the pyknometer at t°C. This gives the apparent specific gravity of the alcoholic liquid in air at t°C / t°C. Record temperature t°C to the nearest 0·5 °C. Determine ethanol content of spirituous preparation through the use of Table 1 and Table 2.

4. TABLES

4.1 Table 1 Apparent Specific Gravity or Apparent Relative Density t°C/ t°C — This table gives specific gravity or relative density in air at various temperatures (10 to 40°C at intervals of 1°C) for various percentages of ethanol (by volume at 20°C).

4.1.1 With the help of this table the measured specific gravity (relative density) in air of an alcoholic liquid at a particular temperature t°C/t°C using pyknometer method, can be converted into its corresponding real strength that is, ethanol content by volume at 20°C.

4.2 Table 2 Correction Table for Real Strength — This table gives the minor corrections required for converting the results of real strength, that is, ethanol content by volume at 20°C, to that at 15°C or 15·56°C as may be required for excise purposes until the international system of ethanol content at 20°C is adopted for excise purposes in our country.

5. TABLE 1 BACKGROUND AND MATHEMATICAL ANALYSIS

5.1 Apparent Specific Gravity $t°/t°$ — The apparent specific gravity or apparent relative density of an alcoholic liquid has been worked out using the OIML data, as follows :

Apparent specific gravity, $t°/t°$

$$= \frac{\text{mass of sample at } t\text{°C in 50 ml pyknometer in air}}{\text{mass of water at } t\text{°C in 50 ml pyknometer in air}}$$

$$= \frac{50 \times \text{density in vacuum, of sample at } t\text{°C} - \text{buoyancy correction}}{50 \times \text{density in vacuum, of water at } t\text{°C} - \text{buoyancy correction}}$$

The density data on aqueous-alcoholic mixtures/ water is taken from OIML tables, pp. 29-41, "Table II : $\rho = \rho_{(q,t)}$", where q = ethanolic content by volume at 20 °C and t is the temperature. Buoyancy correction has been calculated as described in 5.3.

5.1.1 *Example*

Apparent specific gravity 27°/27° of a sample, ethanol content 42·8 percent by volume at 20 °C works out to

$$= \frac{(50 \times 0{\cdot}938\,43) - 0{\cdot}052}{(50 \times 0{\cdot}996\,51) - 0{\cdot}052} = 0{\cdot}941\,66$$

5.1.2 It may be noted that the specific gravity 27°/27° in vacuum for the sample described under 5.1.1 would be

$$0{\cdot}938\,43/0{\cdot}996\,51 = 0{\cdot}941\,72$$

These values have not been included in the pyknometer tables because these would have required the user to convert his apparent speci-

fic gravity values as determined experimentally, to specific gravity values in vacuum, applying necessary buoyancy correction, and this would not have made direct use of pyknometer tables feasible.

5.1.3 The apparent specific gravity tables have been worked out to 5 significant figures. The basic calculations from OIML data in accordance with **5.1** have been done at round values of alcohol strength (q), 1, 2, 3, ... 100 percent and the intermediate values at 0·2 per cent intervals found by proportional parts between the corresponding apparent specific gravity values, for example, the values at 42·6 percent alcohol strength has been worked out by proportional parts between those calculated at 42 and 43 percent. The alternative way of using $\rho_{(q,t)}$ at 42·6 by proportional parts from OIML data and therefrom the apparent specific gravity values would have made the computations unnecessarily much more laborious as the differences, if any, would be of the order of 1 in the fifth significant place and, therefore, ignorable as the data in actual practice has to be used after rounding to the fourth significant figure like the AOAC tables or such abridged tables in Indian Pharmacopoeia which have now been superseded by the OIML data.

5.2 It will be seen that the apparent specific gravity $t°/t°$ is practically independent of the pyknometer accuracy.

Let

$$\sigma = (V \times \rho_{q,t} - \beta)/(V \times \rho_{w,t} - \beta)$$

where σ is the apparent specific gravity $t°/t°$, V is the precise volume of the 50 ml pyknometer, $\rho_{q,t}$ and $\rho_{w,t}$ are the density in vacuum of the sample (ethanolic content q percent by volume at 20°C) and water respectively at t°C, and β is the buoyancy correction, which as will be seen in **5.3.2.1** to **5.3.2.5**, is practically constant for our present purpose.

Now

$$\frac{\delta\sigma}{\delta V} = \beta\,(\rho_{w,t} - \rho_{q,t})/(V\,\rho_{w,t} - \beta)^2$$

which computes to $4{\cdot}1 \times 10^{-6}$, say, for 95 percent by volume ethanol at $t = 27$°C, for which the co-efficient would be relatively higher than that for alcoholic liquids of less ethanol content. Thus an inaccuracy of even 0·2 ml in the 50 ml pyknometer would result in a deviation in the apparent specific gravity, $\Delta\sigma = 4{\cdot}1 \times 10^{-6} \times 0{\cdot}2 \approx 1 \times 10^{-6}$, that is, one in the sixth place of decimal which is quite ignorable for 5 digit data in Table 1.

5.2.1 On the other hand, if pyknometer accuracy is taken for granted, and apparent specific gravity $t°/20$°C, for example, worked out, instead of that at $t°/t°$ as discussed in **5.2**, such apparent specific gravity $t°/20°$ (σ') is given by :

$$\sigma' = (V \times \rho_{q,t} - \beta)/(50 \times \rho_{w,t} - \beta)$$

whence $$\frac{\delta\sigma'}{\delta V} = \rho_{q,t}/(50 \times \rho_{w,t} - \beta)$$

which computes to $1{\cdot}62 \times 10^{-2}$ for ethanol 95 percent by volume, measurement temperature, 27°C. Thus an inaccuracy of 0·2 ml in 50-ml pyknometer as taken in the above example (**5.2**), would result in a deviation of $1{\cdot}62 \times 10^{-2} \times 0{\cdot}2 \approx 0{\cdot}003\,24$ in apparent specific gravity $t°/20°$ specific which is wholly unacceptable. Thus the apparent specific gravity $t°/t°$ computed from OIML data in these tables not only embodies the data of ultimate accuracy available but is also practically independent of the pyknometer accuracy. A pyknometer rigidly standardized at a given temperature is, therefore, not necessary for alcoholometry by pyknometer using these apparent specific gravity $t°/t°$ tables which is a distinct practical advantage in the application of these tables.

5.3 Buoyancy Correction

Buoyancy correction in general is given by :

$$\beta = M\,\rho_{a,t}\left(\frac{1}{\rho_{sample}} - \frac{1}{\rho_m}\right)$$

where M is the apparent mass weighed, $\rho_{a,t}$ the density of air at $t°$ the measurement temperature, ρ_{sample} the density of the sample and ρ_m the density of the metal (alloy) of which the weights used in the balance, are made. In the context of pyknometry, buoyancy correction is contributed by the alcoholic liquid measured as also the glass of the pyknometer. Thus in our context,

$$\beta = V\rho_{q,t}\,\rho_{a,t}\left(\frac{1}{\rho_{qt}} - \frac{1}{\rho_m}\right) + M_{gl}\,\rho_{a,t}\left(\frac{1}{\rho_{gl}} - \frac{1}{\rho_m}\right)$$

where in addition to the quantities already defined, M_{gl} is the mass of the glass pyknometer and ρ_{gl} is the density of the glass of the pyknometer. For a 50-ml pyknometer, usually $M_{gl} =$ 20 g, the buoyancy correction may be worked out at a measurement temperature 27°C, $\rho_{a,t} =$ 0·001 177, assuming $\rho_{gl} = 2{\cdot}5$ and $\rho_m = 8{\cdot}4$, $\rho_{q,t} = 0{\cdot}938\,08$ for 43 percent by volume of ethanol, we have

$$\beta = \underset{\text{(i)}}{0{\cdot}052\,3} + \underset{\text{(ii)}}{0{\cdot}006\,6} = 0{\cdot}058\,9 \approx 0{\cdot}059$$

where (i) is the buoyancy correction for the alcoholic liquid, and (ii) is that for the glass of the pyknometer. Similarly β, for same para-

metres but $\rho_{q,t} = 0{\cdot}805\ 29$ for 95 percent by volume ethanol works out to $0{\cdot}053\ 2 + 0{\cdot}006\ 6 = 0{\cdot}059\ 8 \approx 0{\cdot}060$. Substitution of $V\rho_{q,t}$ for the apparent mass of the alcoholic liquid weighed, for the purpose of the mathematical analysis, is valid as it would not affect the computation of β in any significant manner.

Notwithstanding the above, the masses of the sample/water as are to be used for working out the apparent specific gravity (*see* **5.1**), are experimentally determined by the difference of mass of pyknometer with the sample/water and that when it is empty. The buoyancy correction (ii) for glass, therefore, cancels out (*see* **5.1.1**). β effective is thus 0·052 to 0·053 in the entire range.

5.3.1 Before examining the dependence of buoyancy correction on various perameters, we shall examine the extent to which it affects the computation of apparent specific gravity from OIML data. From the mathematical relationship defined in **5.2**, we have

$$\frac{\delta\sigma}{\delta\beta} = -V(\rho_{w,t} - \rho_{q,t})/(V\rho_{w,t} - \beta)^2$$

which computes to $-3{\cdot}86 \times 10^{-3}$ for 95 percent by volume ethanol, measurements done at 27°C. For a deviation of 0·001 in β, as seen in **5.3**, from 95 percent to 43 percent by volume ethanol, the corresponding deviation in apparent specific gravity, $\Delta\sigma = -3{\cdot}86 \times 10^{-3} \times 0{\cdot}001 = -3{\cdot}86 \times 10^{-6}$ which is ignorable for the purposes of constructing Table 1, specially when β works out to 0·052 for water, 0·052 for 43 percent by volume ethanol, etc, to 0·053 for 59 percent and above by volume ethanol, which values in the light of above considerations have been rounded to 0·052 from 0 up to 58 percent by volume ethanol and 0·053 from 59 to 100 percent by volume ethanol. $\Delta\sigma$ would at the worst work out to $-3{\cdot}86 \times 10^{-3} \times 0{\cdot}0005$ (due to rounding up of β values to third place of decimal) $= -1{\cdot}9 \times 10^{-6}$ which is quite ignorable for 5 digit data in Table 1.

5.3.2 Having worked out the buoyancy correction β, for parameters optimum for pyknometry in Indian ambient conditions, it is necessary to find the variation of β with likely changes in these parameters to ensure the accuracy of the apparent specific gravity values in Table 1.

5.3.2.1 Variation of β with that in pyknometer volume is given by

$$\frac{\delta\beta}{\delta V} = \rho_{q,t} \quad \rho_{a,t}\left(\frac{1}{\rho_{q,t}} - \frac{1}{\rho_m}\right)$$

which works out to $1{\cdot}046 \times 10^{-3}$ for ethanol 43 percent by volume, measurements carried out at 27°C. An inaccuracy of 0·2 ml in the 50 ml pyknometer would result in $\Delta\beta = 1{\cdot}046 \times 10^{-3} \times 0{\cdot}2 \approx 2{\cdot}1 \times 10^{-4}$ which can be ignored as it is seen under **5.3.1** that $\Delta\beta$ below 1×10^{-3} does not affect the computations of apparent specific gravity in Table 1.

5.3.2.2 Variation of β with that in density of the alcoholic liquid (or its ethanolic content) has already been covered under **5.3.1**.

5.3.2.3 Variation of β with that in the density of air (function of temperature, pressure) is given by

$$\frac{\delta\beta}{\delta\rho_{a,t}} = V\rho_{q,t}\left(\frac{1}{\rho_{q,t}} - \frac{1}{\rho_m}\right)$$

which works out to 44·42 for ethanolic content 43 percent by volume and other usual parameters described in **5.3**. An extreme deviation of working temperature of, say, 15°C on either side of the optimum 27°C taken for the evaluation of β (covering working temperature range given in Table 1), would result in a change of air density (at normal atmospheric pressure) of a round 0·000 063, that is $\Delta\beta = 44{\cdot}42 \times 6{\cdot}3 \times 10^{-5} = 0{\cdot}002\ 8$ which as discussed in **5.3.1** would result in $\Delta\sigma$ of $-3{\cdot}86 \times 10^{-3} \times 2{\cdot}80 \times 10^{-3} = -1{\cdot}1 \times 10^{-5}$, that is, by one in the fifth significant figure in the apparent specific gravity values in Table 1. This even at the most extreme temperatures (10 or 40°C) is acceptable as the values in the tables have to be rounded to the fourth significant figure as described in **5.1.3** for the actual application of the pyknometer tables.

Also, a variation in atmospheric pressure from the normal 760 mm would result in a change in air density which is of the order of 8×10^{-5} for a variation of atmospheric pressure by as much as 50 mm (that is, 710 mm atmospheric pressure). This would result in $\Delta\beta = 44{\cdot}42 \times 8 \times 10^{-5} = 3{\cdot}55 \times 10^{-3}$ and in turn $\Delta\sigma = -3{\cdot}86 \times 10^{-3} \times 3{\cdot}55 \times 10^{-3} = -1{\cdot}4 \times 10^{-5}$ which, as described above, would not affect the working accuracy of the data in Table 1.

5.3.2.4 Variation of β with that in the density of the metal (alloy) of the weights in the balance used, is given by:

$$\frac{\delta\beta}{\delta\rho_m} = \frac{\rho_{a,t}\ V\ \rho_{q,t}}{(\rho_m)^2}$$

which works out for 43 percent by volume ethanol and other usual parameters as given in **5.3**, to $0{\cdot}78 \times 10^{-3}$. Thus, a variation in the density of the weights of the order of, say, 0·2 would result in $\Delta\beta = 0{\cdot}78 \times 10^{-3} \times 0{\cdot}2 = 1{\cdot}6 \times 10^{-4}$ corresponding to $\Delta\sigma = -3{\cdot}86 \times 10^{-3} \times 1{\cdot}6 \times 10^{-4} = -0{\cdot}62 \times 10^{-6}$ which would not at all affect the accuracy of the data in Table 1.

5.3.2.5 The question of variation of effective β with change in the mass of the pykno-

meter does not now arise as β contributed by pyknometer cancels out in weighing of sample by difference (*see* **5.3**).

5.4 Table 2 Application

The real strength of an aqueous alcoholic mixture, that is, ethanol content by volume is read in Table 1 as that at 20°C/20°C, the international reference temperature. For excise purposes, ethanol content at 15°C (for medicinal and toilet preparations) and that at 15·56° C/15·56°C (for other alcoholic liquids like Indian made foreign liquors, country spirit, rectified spirit, etc) is still in vogue in our country. Till the international reference temperature of 20°C is adopted, Table 2 may be used to convert ethanol content at 20°C to that at 15°C or 15·56°C by subtracting the minor corrections.

5.4.1 The minor corrections for converting percent by volume at 20°C to that at 15 or 15·56°C have been computed as illustrated below:

Let

$$q_{15}^{\circ} = q_{20}^{\circ} - C$$

where q is the strength by volume and C is the correction factor. q_{20}° means q volumes of ethanol at 20°C in 100 volumes of aqueous ethanol at 20°C

$= q_{20}^{\circ} \times \left(\frac{\rho_{20}^{\circ}}{\rho_{15}^{\circ}}\right)_{\text{ethanol}}$ volumes of ethanol at 15°C

in $100 \times \left(\frac{\rho_{20}^{\circ}}{1\rho_{5}^{\circ}}\right)_{\text{aqethanol}}$ volumes of aqueous ethanol

at 15°C (because $\rho_{20}^{\circ} \times V\,20 = \rho 15^{\circ} \times V\,15^{\circ}$),

that is $q_{20}^{\circ} \times \left(\frac{\rho_{20}^{\circ}}{\rho_{15}^{\circ}}\right)_{\text{ethanol}} \times \left(\frac{\rho_{15}^{\circ}}{\rho_{20}^{\circ}}\right)_{\text{aq-ethanol}}$

volumes of ethanol at 15°C in 100 volumes of aqueous ethanol at 15°C = ρ15°

$$C = b_{20}^{\circ} - q_{20}^{\circ} \times \left[\frac{\rho_{20}^{\circ}}{d_{15}^{\circ}}\right]_{\text{ethanol}} \times \left[\frac{\rho_{15}^{\circ}}{\rho_{20}^{\circ}}\right]_{\text{aqethanol}}$$

For $q_{20}^{\circ} = 25$ percent C work out to

$$C = 25 - \left(25 \times \frac{0{\cdot}789\,24}{0.793\,51} \times \frac{0{\cdot}970\,20}{0{\cdot}968\,10}\right)$$

$= 25 - 24{\cdot}916\,4 = 0{\cdot}080\,6 \approx 0{\cdot}1$

6. EXAMPLES FOR USE OF TABLE 1 AND 2

6.1 Example 1

Let the specific gravity or relative density, $t°/t°$, measured in air with the use of a 50-ml pyknometer be:

a) 0·992 7
b) 0·946 3
c) 0·814 2

at a measurement temperature of 17°C.

Inspecting Table 1 across 17°C in the region of apparent specific gravities (a), (b) and (c), we have the following real alcohol strength (20°C):

a) 5·1 percent (0·992 7 lies between 0·992 8 and 0·992 6, that is, between 5·0 and 5·2 percent).
b) 43·0 percent (0·946 3 lies in the range 0·946 2 and 0·946 6, between 0·946 2 and the mid-value 0·946 4, that is, between 43 and 42·9 percent. 42·95 percent rounded to 43·0 percent).
c) 95·2 percent (0.814 2 lies in the range 0·814 0 and 0·814 8, that is, 95·2 and 95·0 percent between 0·8140 and mid-value 0·8144, that is between 95·2 and 95·1 percent rounded to 95·2 percent).

6.2 Example 2

Let the specific gravity, $t°/t°$, in air using 50 ml pyknometer be:

a) 0·992 7
b) 0·942 3
c) 0·810 3

at a measurement temperature 27·5°C.

Inspecting Table 1, across 27 and 28°C in ther egion of apparent specific gravities (a), (b) and (c) we have the following real alcoholic strengths (20°C):

a) 5·1 percent (0·992 7 lies between 0·992 5 and 0·992 8, mid-values of 27 and 28°C for 5·2 and 5·0 percent that is 5·1 percent).
b) 42·3 percent (0·9423 lies between 0·9421 and 0·942 5, mid-values of 27 and 28°C for 42·4 and 42·2 percent that is, 42:3 percent).
c) 94·3 percent (0·810 3 lies in the range 0·810 6 and 0·809 8, mid-values of 27 and 28° C for 94·2 and 94·4 percent, close to mid value 0·810 2, that is 94·3 percent).

6.3 The values of real alcoholic strength, that is, ethanolic content by volume in Example 1 and 2 (**6.1** and **6.2**) are at 20°C. In order to convert these to the ethanolic content at 15

and 15·56°C using Table 2, we have:

Volume, Percent of Ethanol at		
20°C	15°C	15·56°C
5·1	5·1 − 0·0 = 5·1	5·1 − 0·0 = 5·1
42·3	42·3 − 0·1 = 42·2	42·3 − 0·1 = 42·2
43·0	43·0 − 0·1 = 41·9	43·0 − 0·1 = 42·9
94·3	94·3 − 0·0 = 94·3	94·3 − 0·0 = 94·3
95·2	95·2 − 0·0 = 95·2	95·2 − 0·0 = 95·2

The rounding off values read from Table 1 and 2 and used in the above examples has been done in accordance with IS : 2-1960*.

*Rules for rounding off numerical values (*revised*).

7. DOUBLE BULK, TREBLE BULK AND QUADRUPLE BULK

7.1 If the double bulk, treble bulk and quadruple bulk methods are employed in the determination of specific gravity by the pyknometer method for want of sufficient amount of the liquid, the percentage of ethanol by volume is found as detailed under **6** from the specific gravity obtained by the pyknometer method. Then the actual percentage of ethanol is calculated by multiplying it by 2, 3 or 4 depending upon whether double, treble or quadruple bulk method is employed.

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures

(*Clauses* 0.4, 1.1, 3.0, 3.3.5, 5.3.1, 5.3.2, 5.3.2.1, 5.3.2.3, 5.3.2.4, 5.4, 6, 6.1 *and* 6.2)

Temperature °C	Percentages of Volume at 20°C									
	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8
10	1.000 00	0.999 70	0.999 39	0.999 09	0.998 78	0.998 48	0.998 19	0.997 90	0.997 60	0.997 31
11	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
12	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 91	0.997 61	0.997 32
13	1.000 00	0.99970	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 91	0.997 61	0.997 32
14	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
15	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 19	0.997 90	0.997 60	0.997 31
16	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
17	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
18	1.000 00	0.999 70	0.999 40	0.999 10	0.998 80	0.998 50	0.998 20	0.997 91	0.997 61	0.997 32
19	1.000 00	0.999 70	0.999 40	0.999 10	0.998 80	0.998 50	0.998 20	0.997 91	0.997 61	0.997 32
20	1.000 00	0.999 70	0.999 40	0.999 10	0.998 80	0.998 50	0.998 20	0.997 91	0.997 61	0.997 32
21	1.000 00	0.999 70	0.999 40	0.999 10	0.998 80	0.998 50	0.998 20	0.997 91	0.997 61	0.997 32
22	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
23	1.000 00	0.999 70	0.999 39	0.999 09	0.998 78	0.998 48	0.998 19	0.997 90	0.997 60	0.997 31
24	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
25	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
26	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
27	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 20	0.997 90	0.997 61	0.997 31
28	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 19	0.997 90	0.997 60	0.997 31
29	1.000 00	0.999 70	0.999 40	0.999 09	0.998 79	0.998 49	0.998 19	0.997 89	0.997 60	0.997 30
30	1.000 00	0.999 70	0.999 39	0.999 09	0.998 78	0.998 48	0.998 18	0.997 88	0.997 59	0.997 29
31	1.000 00	0.999 70	0.999 39	0.999 09	0.999 78	0.998 48	0.998 18	0.997 88	0.997 59	0.997 29
32	1.000 00	0.999 70	0.999 39	0.999 09	0.998 78	0.998 48	0.998 18	0.997 88	0.997 59	0.997 29
33	1.000 00	0.999 69	0.999 39	0.999 08	0.998 78	0.998 47	0.998 17	0.997 87	0.997 58	0.997 28
34	1.000 00	0.999 69	0.999 39	0.999 08	0.998 78	0.998 47	0.998 17	0.997 87	0.997 57	0.997 27
35	1.000 00	0.999 69	0.999 38	0.999 08	0.998 77	0.998 46	0.998 16	0.997 86	0.997 57	0.997 27
36	1.000 00	0.999 69	0.999 38	0.999 08	0.998 77	0.998 46	0.998 16	0.997 86	0.997 56	0.997 26
37	1.000 00	0.999 69	0.999 38	0.999 07	0.998 76	0.998 45	0.998 15	0.997 85	0.997 55	0.997 25
38	1.000 00	0.999 69	0.999 38	0.999 07	0.998 76	0.998 45	0.998 15	0.997 85	0.997 54	0.997 24
39	1.000 00	0.999 69	0.999 38	0.999 07	0.998 76	0.998 45	0.998 14	0.997 84	0.997 53	0.997 23
40	1.000 00	0.999 69	0.999 38	0.999 06	0.998 75	0.998 44	0.998 13	0.997 83	0.997 52	0.997 22

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8
10	0.997 02	0.996 73	0.996 45	0.996 16	0.995 88	0.995 59	0.995 32	0.995 04	0.994 77	0.994 49
11	0.997 02	0.996 74	0.99645	0.996 17	0.995 88	0.995 60	0.995 33	0.995 05	0.994 78	0.994 50
12	0.997 03	0.996 74	0.996 46	0.996 17	0.995 89	0.995 60	0.995 33	0.995 05	0.994 78	0.994 50
13	0.997 03	0.996 74	0.996 46	0.996 17	0.995 89	0.995 60	0.995 32	0.995 05	0.994 77	0.994 50
14	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 05	0.994 77	0.994 50
15	0.997 01	0.996 73	0.996 44	0.996 16	0.995 87	0.995 59	0.995 31	0.995 04	0.994 76	0.994 49
16	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 04	0.994 77	0.994 49
17	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 04	0.994 77	0.994 49
18	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 04	0.994 77	0.994 49
19	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 04	0.994 76	0.994 48
20	0.997 02	0.996 74	0.996 45	0.996 17	0.995 88	0.995 60	0.995 32	0.995 04	0.994 75	0.994 47
21	0.997 02	0.996 73	0.996 45	0.996 16	0.995 88	0.995 59	0.995 31	0.995 03	0.994 75	0.994 47
22	0.997 02	0.996 73	0.996 45	0.996 16	0.995 88	0.995 59	0.995 31	0.995 03	0.994 74	0.994 46
23	0.997 02	0.996 73	0.996 44	0.996 16	0.995 87	0.995 58	0.995 30	0.995 02	0.994 74	0.994 46
24	0.997 02	0.996 73	0.996 44	0.996 16	0.995 87	0.995 58	0.995 30	0.995 02	0.994 74	0.994 46
25	0.997 02	0.996 73	0.996 44	0.996 16	0.995 87	0.995 58	0.995 30	0.995 02	0.994 73	0.994 45
26	0.997 02	0.996 73	0.996 44	0.996 15	0.995 86	0.995 57	0.995 29	0.995 01	0.994 73	0.994 45
27	0.997 02	0.996 73	0.996 44	0.996 15	0.995 86	0.995 57	0.995 29	0.995 00	0.994 72	0.994 43
28	0.997 01	0.996 72	0.996 43	0.996 14	0.995 85	0.995 56	0.995 28	0.994 99	0.994 71	0.994 42
29	0.997 00	0.996 71	0.996 42	0.996 14	0.995 85	0.995 56	0.995 27	0.994 99	0.994 70	0.994 42
30	0.996 99	0.996 70	0.996 41	0.996 12	0.995 83	0.995 54	0.995 26	0.994 97	0.994 69	0.994 40
31	0.996 99	0.996 70	0.996 41	0.996 11	0.995 82	0.995 53	0.995 25	0.994 96	0.994 68	0.994 39
32	0.996 99	0.996 70	0.996 41	0.996 11	0.995 82	0.995 53	0.995 24	0.994 96	0.994 67	0.994 39
33	0.996 98	0.996 69	0.996 40	0.996 10	0.995 81	0.995 52	0.995 23	0.994 94	0.994 66	0.994 37
34	0.996 97	0.996 68	0.996 39	0.996 09	0.995 80	0.995 51	0.995 22	0.994 93	0.994 65	0.994 36
35	0.99 97	0.996 68	0.996 38	0.996 09	0.995 79	0995 50	0.995 21	0.994 92	0.994 64	0.994 35
36	0.996 96	0.996 67	0.996 37	0.996 08	0.995 78	0.995 49	0.995 20	0.994 91	0.994 63	0.994 34
37	0.996 95	0.996 65	0.996 36	0.996 06	0.995 77	0.995 47	0.995 18	0.994 89	0.994 60	0.994 31
38	0.996 94	0.996 64	0.996 34	0.996 05	0.995 75	0.995 45	0.995 16	0.994 87	0.994 59	0.994 30
39	0.996 92	0.996 62	0.996 33	0.996 03	0.995 74	0.995 44	0.995 15	0.994 86	0.994 57	0.994 28
40	0.996 91	0.996 61	0.996 32	0.996 02	0.995 73	0.995 43	0.995 14	0.994 85	0.994 55	0.994 26

Temperature °C	Percentages of Volume at 20°C									
	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8
10	0.994 22	0.993 96	0.993 69	0.993 43	0.993 16	0.992 90	0.992 64	0.992 38	0.992 13	0.991 87
11	0.994 23	0.993 96	0.993 70	0.993 43	0.993 17	0.992 90	0.992 64	0.992 38	0.992 13	0.991 87
12	0.994 23	0.993 96	0.993 69	0.993 43	0.993 16	0.992 89	0.992 63	0.992 37	0.992 12	0.991 86
13	0.994 22	0.993 95	0.993 69	0.993 42	0.993 16	0.992 89	0.992 63	0.992 37	0.992 11	0.991 85
14	0.994 22	0.993 95	0.993 68	0.993 42	0.993 15	0.992 88	0.992 62	0.992 36	0.992 09	0.991 83
15	0.994 21	0.993 94	0.993 67	0.993 41	0.993 14	0.992 87	0.992 61	0.992 34	0.992 08	0.991 81
16	0.994 21	0.993 94	0.993 67	0.993 41	0.993 14	0.992 87	0.992 61	0.992 34	0.992 08	0.991 81
17	0.994 21	0.993 94	0.993 67	0.993 39	0.993 12	0.992 85	0.992 59	0.992 33	0.992 06	0.991 80
18	0.994 21	0.993 94	0.993 67	0.993 39	0.993 12	0.992 85	0.992 59	0.992 32	0.992 06	0.991 79
19	0.994 20	0.993 93	0.993 66	0.993 38	0.993 11	0.992 84	0.992 58	0.992 31	0.992 05	0.991 78
20	0.994 19	0.993 92	0.993 65	0.993 38	0.993 11	0.992 84	0.992 57	0.992 31	0.992 04	0.991 78
21	0.994 19	0.993 92	0.993 65	0.993 37	0.993 10	0.992 83	0.992 56	0.992 29	0.992 03	0.991 76
22	0.994 18	0.993 91	0.993 64	0.993 36	0.993 09	0.992 82	0.992 55	0.992 28	0.992 01	0.991 74
23	0.994 18	0.993 90	0.993 63	0.993 35	0.993 08	0.992 80	0.992 53	0.992 26	0.992 00	0.991 73
24	0.994 18	0.993 90	0.993 63	0.993 35	0.993 08	0.992 80	0.992 53	0.992 26	0.991 99	0.991 72
25	0.994 17	0.993 89	0.993 62	0.993 34	0.993 07	0.992 79	0.992 52	0.992 25	0.991 98	0.991 71
26	0.994 17	0.993 89	0.993 61	0.993 34	0.993 06	0.992 78	0.992 51	0.992 24	0.991 96	0.991 69
27	0.994 15	0.993 87	0.993 60	0.993 32	0.993 05	0.992 77	0.992 50	0.992 22	0.991 95	0.991 67
28	0.994 14	0.993 86	0.993 59	0.993 31	0.993 04	0.992 76	0.992 49	0.992 21	0.991 94	0.991 66
29	0.994 13	0.993 85	0.993 57	0.993 30	0.993 02	0.992 74	0.992 47	0.992 19	0.991 92	0.991 64
30	0.994 12	0.993 84	0.993 56	0.993 28	0.993 00	0.992 72	0.992 44	0.992 17	0.991 89	0.991 62
31	0.994 11	0.993 83	0.993 55	0.993 27	0.992 99	0.992 71	0.992 43	0.992 16	0.991 88	0.991 61
32	0.994 10	0.993 82	0.993 54	0.993 26	0.992 98	0.992 70	0.992 42	0.992 15	0.991 87	0.991 60
33	0.994 08	0.993 80	0.993 52	0.993 23	0.992 95	0.992 67	0.992 39	0.992 12	0.991 84	0.991 57
34	0.994 07	0.993 79	0.993 51	0.993 22	0.992 94	0.992 66	0.992 38	0.992 10	0.991 83	0.991 55
35	0.994 06	0.993 78	0.993 49	0.993 21	0.992 92	0.992 64	0.992 36	0.992 08	0.991 81	0.991 53
36	0.994 05	0.993 77	0.993 48	0.993 20	0.992 91	0.992 63	0.992 35	0.992 07	0.991 79	0.991 51
37	0.994 02	0.993 74	0.993 45	0.993 17	0.992 88	0.992 60	0.992 32	0.992 04	0.991 76	0.991 48
38	0.994 01	0.993 72	0.993 44	0.993 15	0.992 87	0.992 58	0.992 30	0.992 02	0.991 75	0.991 47
39	0.993 99	0.993 71	0.993 42	0.993 14	0.992 85	0.992 57	0.992 29	0.992 01	0.991 72	0.991 44
40	0.993 97	0.993 68	0.993 40	0.993 11	0.992 83	0.992 54	0.992 26	0.991 98	0.991 69	0.991 41

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8
10	0.991 61	0.991 36	0.991 11	0.990 87	0.990 62	0.990 37	0.990 13	0.989 89	0.989 64	0.989 40
11	0.991 61	0.991 36	0.991 11	0.990 86	0.990 61	0.990 36	0.990 11	0.989 87	0.989 62	0.989 38
12	0.991 60	0.991 35	0.991 10	0.990 84	0.990 59	0.990 34	0.990 09	0.989 85	0.989 60	0.989 36
13	0.991 59	0.991 34	0.991 08	0.990 83	0.990 57	0.990 32	0.990 07	0.989 83	0.989 58	0.989 34
14	0.991 57	0.991 32	0.991 06	0.990 81	0.990 55	0.990 30	0.990 05	0.989 81	0.989 56	0.989 32
15	0.991 55	0.991 30	0.991 04	0.990 79	0.990 53	0.990 28	0.990 03	0.989 78	0.989 54	0.989 29
16	0.991 55	0.991 29	0.991 04	0.990 78	0.990 53	0.990 27	0.990 02	0.989 77	0.989 53	0.989 28
17	0.991 54	0.991 28	0.991 03	0.990 77	0.990 52	0.990 26	0.990 01	0.989 76	0.989 51	0.989 26
18	0.991 53	0.991 27	0.991 01	0.990 76	0.990 50	0.990 24	0.989 99	0.989 74	0.989 48	0.989 23
19	0.991 52	0.991 26	0.991 00	0.990 74	0.990 48	0.990 22	0.989 97	0.989 72	0.989 46	0.989 21
20	0.991 51	0.991 25	0.990 99	0.990 72	0.990 46	0.990 20	0.989 95	0.989 69	0.989 44	0.989 18
21	0.991 49	0.991 23	0.990 97	0.990 70	0.990 44	0.990 18	0.989 93	0.989 67	0.989 42	0.989 16
22	0.991 47	0.991 21	0.990 95	0.990 69	0.990 43	0.990 17	0.989 91	0.989 65	0.989 40	0.989 14
23	0.991 46	0.991 20	0.990 94	0.990 67	0.990 41	0.990 15	0.989 89	0.989 63	0.989 37	0.989 11
24	0.991 45	0.991 19	0.990 92	0.990 66	0.990 39	0.990 13	0.989 87	0.989 61	0.989 36	0.989 10
25	0.991 44	0.991 17	0.990 91	0.990 64	0.990 38	0.990 11	0.989 85	0.989 59	0.989 33	0.989 07
26	0.991 42	0.991 15	0.990 89	0.990 62	0.990 36	0.990 09	0.989 83	0.989 57	0.989 30	0.989 04
27	0.991 40	0.991 13	0.990 86	0.990 60	0.990 33	0.990 06	0.989 80	0.989 54	0.989 28	0.989 02
28	0.991 39	0.991 12	0.990 85	0.990 58	0.990 31	0.990 04	0.989 78	0.989 52	0.989 25	0.988 99
29	0.991 37	0.991 10	0.990 83	0.990 57	0.990 30	0.9990 03	0.989 76	0.989 50	0.989 23	0.988 97
30	0.991 34	0.991 07	0.990 80	0.990 54	0.990 27	0.990 00	0.989 73	0.989 47	0.989 20	0.988 94
31	0.991 33	0.991 06	0.990 79	0.990 51	0.990 24	0.989 97	0.989 71	0.989 44	0.989 18	0.988 91
32	0.991 32	0.991 05	0.990 78	0.990 50	0.990 23	0.989 96	0.989 69	0.989 42	0.989 16	0.988 89
33	0.991 29	0.991 02	0.990 75	0.990 47	0.990 20	0.989 93	0.989 66	0.989 39	0.989 13	0.988 86
34	0.991 27	0.991 00	0.990 72	0.990 45	0.990 17	0.989 90	0.989 63	0.989 36	0.989 09	0.988 82
35	0.991 25	0.990 98	0.990 70	0.990 43	0.990 15	0.989 88	0.989 61	0.989 34	0.989 07	0.988 80
36	0.991 23	0.990 96	0.990 68	0.990 41	0.990 13	0.989 86	0.989 59	0.989 32	0.989 04	0.988 77
37	0.991 20	0.990 92	0.990 65	0.990 37	0.990 10	0.989 82	0.989 55	0.989 28	0.989 00	0.988 73
38	0.991 19	0.990 91	0.990 64	0.990 36	0.990 09	8.989 81	0.989 54	0.989 26	0.988 99	0.988 71
39	0.991 16	0.990 88	0.990 60	0.990 33	0.990 05	0.989 77	0.989 50	0.989 22	0.988 95	0.988 67
40	0.991 13	0.990 85	0.990 58	0.990 30	0.990 03	0.989 75	0.989 48	0.989 20	0.988 93	0.988 65

Temperature °C	Percentages of Volume at 20°C									
	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8
10	0.989 16	0.988 92	0.988 69	0.988 45	0.988 22	0.987 98	0.987 75	0.987 52	0.987 30	0.987 07
11	0.989 13	0.988 89	0.988 66	0.988 42	0.988 19	0.987 95	0.987 72	0.987 49	0.987 27	0.987 04
12	0.989 11	0.988 87	0.988 64	0.988 40	0.988 17	0.987 93	0.987 70	0.987 47	0.987 24	0.987 01
13	0.989 09	0.988 85	0.988 61	0.988 38	0.988 14	0.987 90	0.987 67	0.987 44	0.987 20	0.986 97
14	0.989 07	0.988 83	0.988 59	0.988 35	0.988 11	0.987 87	0.987 64	0.987 40	0.987 17	0.986 93
15	0.989 04	0.988 80	0.988 56	0.988 32	0.988 08	0.987 84	0.987 60	0.987 36	0.987 13	0.986 89
16	0.989 03	0.988 78	0.988 54	0.988 29	0.988 05	0.987 80	0.98756	0.987 33	0.987 09	0.986 86
17	0.989 01	0.988 76	0.988 52	0.988 27	0.988 03	0.987 78	0.987 54	0.987 30	0.987 07	0.986 83
18	0.988 98	0.988 73	0.988 49	0.988 24	0.988 00	0.987 75	0.987 51	0.987 27	0.987 03	0.986 79
19	0.988 96	0.988 71	0.988 46	0.988 22	0.987 97	0.987 72	0.987 48	0.987 24	0.986 99	0.986 75
20	0.988 93	0.988 68	0.988 43	0.988 19	0.987 94	0.987 69	0.987 45	0.987 20	0.986 96	0.986 71
21	0.988 91	0.988 66	0.988 41	0.988 15	0.987 90	0.987 65	0.987 41	0.987 16	0.986 92	0.986 67
22	0.988 88	0.988 63	0.988 38	0.988 12	0.987 87	0.987 62	0.987 38	0.987 13	0.986 89	0.986 64
23	0.988 85	0.988 60	0.988 35	0.988 09	0.987 84	0.987 59	0.987 34	0.987 09	0.986 85	0.986 60
24	0.988 84	0.988 58	0.988 33	0.988 07	0.987 82	0.987 56	0.987 31	0.987 06	0.986 82	0.986 57
25	0.988 81	0.988 55	0.988 30	0.988 04	0.987 79	0.987 53	0.987 28	0.987 03	0.986 78	0.986 53
26	0.988 78	0.988 52	0.988 27	0.988 01	0.987 76	0.987 50	0.987 25	0.987 00	0.986 74	0.986 49
27	0.988 76	0.988 50	0.988 24	0.987 98	0.987 72	0.987 46	0.987 21	0.986 96	0.986 70	0.986 45
28	0.988 73	0.988 47	0.988 21	0.987 95	0.987 69	0.987 43	0.987 17	0.986 92	0.986 66	0.986 41
29	0.988 70	0.988 44	0.988 18	0.987 93	0.987 67	0.987 41	0.987 15	0.986 89	0.986 64	0.986 38
30	0.988 67	0.988 41	0.988 15	0.987 88	0.987 62	0.987 36	0.987 10	0.986 84	0.986 58	0.986 32
31	0.988 65	0.988 39	0.988 12	0.987 86	0.987 59	0.987 33	0.987 07	0.986 81	0.986 55	0.986 29
32	0.988 62	0.988 36	0.988 09	0.987 83	0.987 56	0.987 30	0.987 04	0.986 78	0.986 52	0.986 26
33	0.988 59	0.988 32	0.988 06	0.987 79	0.987 53	0.987 26	0.987 00	0.986 74	0.986 47	0.986 21
34	0.988 55	0.988 28	0.988 02	0.987 75	0.987 49	0.987 22	0.986 96	0.986 70	0.986 43	0.986 17
35	0.988 53	0.988 26	0.987 99	0.987 73	0.987 46	0.987 19	0.986 93	0.986 66	0.986 40	0.986 13
36	0.988 50	0.988 23	0.987 96	0.987 70	0.987 43	0.987 16	0.986 90	0.986 63	0.986 37	0.986 10
37	0.988 46	0.988 19	0.987 92	0.987 66	0.987 39	0.987 12	0.986 85	0.986 58	0.986 32	0.986 05
38	0.988 44	0.988 17	0.987 90	0.987 63	0.987 36	0.987 09	0.986 82	0.986 55	0.986 29	0.986 02
39	0.988 40	0.988 13	0.987 86	0.987 59	0.987 32	0.987 05	0.986 78	0.986 51	0.986 25	0.985 98
40	0.988 38	0.988 11	0.987 84	0.987 56	0.987 29	0.987 02	0.986 75	0.986 48	0.986 21	0.985 94

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8
10	0.986 84	0.986 62	0.986 40	0.986 18	0.985 96	0.985 74	0.985 53	0.985 31	0.985 10	0.984 88
11	0.986 81	0.986 59	0.986 37	0.986 14	0.985 92	0.985 70	0.985 48	0.985 27	0.985 05	0.984 84
12	0.986 78	0.986 56	0.986 33	0.986 11	0.985 88	0.985 66	0.985 44	0.985 22	0.985 01	0.984 79
13	0.986 74	0.986 51	0.986 29	0.986 06	0.985 84	0.985 61	0.985 39	0.985 17	0.984 94	0.984 72
14	0.986 70	0.986 47	0.986 24	0.986 01	0.985 78	0.985 55	0.985 33	0.985 11	0.984 88	0.984 66
15	0.986 65	0.986 42	0.986 19	0.985 97	0.985 74	0.985 51	0.985 29	0.985 06	0.984 84	0.984 61
16	0.986 62	0.986 39	0.986 16	0.985 92	0.985 69	0.985 46	0.985 24	0.985 01	0.984 79	0.984 56
17	0.986 59	0.986 36	0.986 12	0.985 89	0.985 65	0.985 42	0.985 19	0.984 96	0.984 73	0.984 50
18	0.986 55	0.986 31	0.986 08	0.985 84	0.985 61	0.985 37	0.985 14	0.984 91	0.984 68	0.984 45
19	0.986 51	0.986 27	0.986 04	0.985 80	0.985 57	0.985 33	0.985 10	0.984 87	0.984 63	0.984 40
20	0.986 47	0.986 23	0.985 99	0.985 76	0.985 52	0.985 28	0.985 04	0.984 81	0.984 57	0.984 34
21	0.986 43	0.986 19	0.985 95	0.985 71	0.985 47	0.985 23	0.984 99	0.984 76	0.984 52	0.984 29
22	0.986 40	0.986 16	0.985 91	0.985 67	0.985 42	0.985 18	0.984 94	0.984 71	0.984 47	0.984 24
23	0.986 35	0.986 11	0.985 87	0.985 62	0.985 38	0.985 14	0.984 90	0.984 66	0.984 41	0.984 17
24	0.986 32	0.986 07	0.985 83	0.985 58	0.985 34	0.985 09	0.984 85	0.984 61	0.984 37	0.984 13
25	0.986 28	0.986 03	0.985 78	0.985 54	0.985 29	0.985 04	0.984 80	0.984 56	0.984 31	0.984 07
26	0.986 24	0.985 99	0.985 74	0.985 50	0.985 25	0.985 00	0.984 75	0.984 51	0.984 26	0.984 02
27	0.986 20	0.985 95	0.985 70	0.985 45	0.985 20	0.984 95	0.984 70	0.984 46	0.984 21	0.983 97
28	0.986 15	0.985 90	0.985 65	0.985 40	0.985 15	0.984 90	0.984 65	0.984 40	0.984 16	0.983 91
29	0.986 12	0.985 87	0.985 61	0.985 36	0.985 10	0.984 85	0.984 60	0.984 35	0.984 11	0.983 86
30	0.986 06	0.985 81	0.985 56	0.985 30	0.985 05	0.984 80	0.984 55	0.984 30	0.984 04	0.983 79
31	0.986 03	0.985 77	0.985 52	0.985 26	0.985 01	0.984 75	0.984 50	0.984 25	0.983 99	0.983 74
32	0.986 00	0.985 74	0.985 48	0.985 23	0.984 97	0.984 71	0.984 46	0.984 20	0.983 95	0.983 69
33	0.985 95	0.985 69	0.985 43	0.985 18	0.984 92	0.984 66	0.984 40	0.984 14	0.983 89	0.983 63
34	0.985 91	0.985 65	0.985 39	0.985 13	0.984 87	0.984 61	0.984 35	0.984 09	0.983 84	0.983 58
35	0.985 87	0.985 61	0.985 35	0.985 08	0.984 82	0.984 56	0.984 30	0.984 04	0.983 78	0.983 52
36	0.985 84	0.985 58	0.985 31	0.985 05	0.984 78	0.984 52	0.984 26	0.984 00	0.983 73	0.983 47
37	0.985 78	0.985 52	0.985 25	0.984 99	0.984 72	0.984 46	0.984 20	0.983 94	0.983 67	0.983 41
38	0.985 75	0.985 48	0.985 22	0.984 95	0.984 69	0.984 42	0.984 16	0.983 89	0.983 63	0.983 36
39	0.985 71	0.985 44	0.985 18	0.984 91	0.984 65	0.984 38	0.984 11	0.983 85	0.983 58	0.983 32
40	0.985 67	0.985 40	0.985 13	0.984 87	0.984 60	0.984 33	0.984 06	0.983 80	0.983 53	0.983 27

Temperature °C	Percentages of Volume at 20°C									
	12.0	12.2	12.4	12.6	12.8	13.0	13.2	13.4	13.6	13.8
10	0.984 67	0.984 46	0.984 25	0.984 05	0.983 84	0.983 63	0.983 43	0.983 23	0.983 02	0.982 82
11	0.984 62	0.984 41	0.984 20	0.983 99	0.983 78	0.983 57	0.983 36	0.983 16	0.982 95	0.982 75
12	0.984 57	0.984 36	0.984 14	0.983 93	0.983 71	0.983 50	0.983 29	0.983 08	0.982 88	0.982 67
13	0.984 50	0.984 29	0.984 07	0.983 86	0.983 64	0.983 43	0.983 22	0.983 01	0.982 80	0.982 59
14	0.984 44	0.984 22	0.984 01	0.983 79	0.983 58	0.983 36	0.983 15	0.982 94	0.982 72	0.982 51
15	0.984 39	0.984 17	0.983 95	0.983 73	0.983 51	0.983 29	0.983 08	0.982 86	0.982 65	0.982 43
16	0.984 34	0.984 12	0.983 89	0.983 67	0.983 44	0.983 22	0.983 00	0.982 79	0.982 57	0.982 36
17	0.984 27	0.984 05	0.983 83	0.983 60	0.983 38	0.983 16	0.982 94	0.982 72	0.982 50	0.982 28
18	0.984 22	0.984 00	0.983 77	0.983 55	0.983 32	0.983 10	0.982 88	0.982 66	0.982 43	0.982 21
19	0.984 17	0.983 94	0.983 71	0.983 49	0.983 26	0.983 03	0.982 81	0.982 58	0.982 36	0.982 13
20	0.984 10	0.983 87	0.983 64	0.983 42	0.983 19	0.982 96	0.982 73	0.982 51	0.982 28	0.982 06
21	0.984 05	0.983 82	0.983 59	0.983 36	0.983 13	0.982 90	0.982 67	0.982 44	0.982 21	0.981 98
22	0.984 00	0.983 76	0.983 53	0.983 29	0.983 06	0.982 82	0.982 59	0.982 36	0.982 13	0.981 90
23	0.983 93	0.983 70	0.983 46	0.983 23	0.982 99	0.982 76	0.982 53	0.982 30	0.982 06	0.981 83
24	0.983 89	0.983 65	0.983 41	0.983 18	0.982 94	0.982 70	0.982 46	0.982 23	0.981 99	0.981 76
25	0.983 83	0.983 59	0.983 35	0.983 11	0.982 87	0.982 63	0.982 39	0.982 16	0.981 92	0.981 69
26	0.983 77	0.983 53	0.983 29	0.983 05	0.982 81	0.982 57	0.982 33	0.982 09	0.981 85	0.981 61
27	0.983 72	0.983 48	0.983 23	0.982 99	0.982 74	0.982 50	0.982 26	0.982 02	0.981 78	0.981 54
28	0.983 66	0.983 42	0.983 17	0.982 93	0.982 68	0.982 44	0.982 20	0.981 95	0.981 71	0.981 46
29	0.983 61	0.983 36	0.983 11	0.982 87	0.982 62	0.982 37	0.982 12	0.981 88	0.981 63	0.981 39
30	0.983 54	0.983 29	0.983 04	0.982 79	0.982 54	0.982 29	0.982 04	0.981 80	0.981 55	0.981 31
31	0.983 49	0.983 24	0.982 99	0.982 73	0.982 48	0.982 23	0.981 98	0.981 73	0.981 49	0.981 24
32	0.983 44	0.983 19	0.982 93	0.982 68	0.982 42	0.982 17	0.981 92	0.981 67	0.981 42	0.981 17
33	0.983 37	0.983 12	0.982 87	0.982 61	0.982 36	0.982 11	0.981 86	0.981 60	0.981 35	0.981 09
34	0.983 32	0.983 06	0.982 81	0.982 55	0.982 30	0.982 04	0.981 78	0.981 53	0.981 27	0.981 02
35	0.983 26	0.983 00	0.982 74	0.982 49	0.982 23	0.981 97	0.981 71	0.981 46	0.981 20	0.980 95
36	0.983 21	0.982 95	0.982 69	0.982 44	0.982 18	0.981 92	0.981 66	0.981 40	0.981 15	0.980 89
37	0.983 15	0.982 89	0.982 63	0.982 37	0.982 11	0.981 85	0.981 59	0.981 33	0.981 07	0.980 81
38	0.983 10	0.982 84	0.982 58	0.982 31	0.982 05	0.981 79	0.981 53	0.981 27	0.981 00	0.980 74
39	0.983 05	0.982 79	0.982 52	0.982 26	0.981 99	0.981 73	0.981 47	0.981 20	0.980 94	0.980 67
40	0.983 00	0.982 73	0.982 47	0.982 20	0.981 94	0.981 67	0.981 41	0.981 14	0.980 88	0.980 61

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	14.0	14.2	14.4	14.6	14.8	15.0	15.2	15.4	15.6	15.8
10	0.982 62	0.982 42	0.982 22	0.982 03	0.981 83	0.981 63	0.981 44	0.981 24	0.981 05	0.980 85
11	0.982 54	0.982 34	0.982 14	0.981 93	0.981 73	0.981 53	0.981 34	0.981 14	0.980 95	0.980 75
12	0.982 46	0.982 26	0.982 06	0.981 85	0.981 65	0.981 45	0.981 25	0.981 05	0.980 85	0.980 65
13	0.982 38	0.982 18	0.981 97	0.981 77	0.981 56	0.981 36	0.981 16	0.980 96	0.980 76	0.980 56
14	0.982 30	0.982 09	0.981 88	0.981 68	0.981 47	0.981 26	0.981 05	0.980 85	0.980 64	0.980 44
15	0.982 22	0.982 01	0.981 80	0.981 58	0.981 37	0.981 16	0.980 95	0.980 74	0.980 54	0.980 33
16	0.982 14	0.981 93	0.981 71	0.981 50	0.981 28	0.981 07	0.980 86	0.980 65	0.980 45	0.980 24
17	0.982 06	0.981 85	0.981 63	0.981 42	0.981 20	0.980 99	0.980 78	0.980 56	0.980 35	0.980 13
18	0.981 99	0.981 77	0.981 55	0.981 33	0.981 11	0.980 89	0.980 68	0.980 46	0.980 25	0.980 03
19	0.981 91	0.981 69	0.981 47	0.981 25	0.981 03	0.980 81	0.980 59	0.980 37	0.980 16	0.979 94
20	0.981 83	0.981 61	0.981 39	0.981 16	0.980 94	0.980 72	0.980 50	0.980 28	0.980 05	0.979 83
21	0.981 75	0.981 52	0.981 30	0.981 07	0.980 85	0.980 62	0.980 40	0.980 18	0.979 95	0.979 73
22	0.981 67	0.981 44	0.981 22	0.980 99	0.980 77	0.980 54	0.980 31	0.980 09	0.979 86	0.979 64
23	0.981 60	0.981 37	0.981 14	0.980 90	0.980 67	0.980 44	0.980 21	0.979 99	0.979 76	0.979 54
24	0.981 52	0.981 29	0.981 06	0.980 83	0.980 60	0.980 37	0.980 14	0.979 91	0.979 67	0.979 44
25	0.981 45	0.981 21	0.980 98	0.980 74	0.980 51	0.980 27	0.980 04	0.979 81	0.979 58	0.979 35
26	0.981 37	0.981 13	0.980 90	0.980 66	0.980 43	0.980 19	0.979 95	0.979 72	0.979 48	0.979 25
27	0.981 30	0.981 06	0.980 82	0.980 58	0.980 34	0.980 10	0.979 86	0.979 62	0.979 39	0.979 15
28	0.981 22	0.980 98	0.980 74	0.980 49	0.980 25	0.980 01	0.979 77	0.979 53	0.979 30	0.979 06
29	0.981 14	0.980 90	0.980 66	0.980 41	0.980 17	0.979 93	0.979 69	0.979 45	0.979 20	0.978 96
30	0.981 06	0.980 81	0.980 57	0.980 32	0.980 08	0.979 83	0.979 59	0.979 34	0.979 10	0.978 85
31	0.980 99	0.980 74	0.980 49	0.980 25	0.980 00	0.979 75	0.979 50	0.979 26	0.979 01	0.978 77
32	0.980 92	0.980 67	0.980 42	0.980 17	0.979 92	0.979 67	0.979 42	0.979 17	0.978 93	0.978 68
33	0.980 84	0.980 59	0.980 34	0.980 08	0.979 83	0.979 58	0.979 33	0.979 08	0.978 83	0.978 58
34	0.980 76	0.980 51	0.980 25	0.980 00	0.979 74	0.979 49	0.979 24	0.978 99	0.978 73	0.978 48
35	0.980 69	0.980 44	0.980 18	0.979 93	0.979 67	0.979 42	0.979 16	0.978 91	0.978 65	0.978 40
36	0.980 63	0.980 37	0.980 11	0.979 86	0.979 60	0.979 34	0.979 08	0.978 82	0.978 57	0.978 31
37	0.980 55	0.980 29	0.980 03	0.979 77	0.979 51	0.979 25	0.978 99	0.978 73	0.978 47	0.978 21
38	0.980 48	0.980 22	0.979 96	0.979 69	0.979 43	0.979 17	0.978 91	0.978 65	0.978 38	0.978 12
39	0.980 41	0.980 15	0.979 88	0.979 62	0.979 35	0.979 09	0.978 83	0.978 56	0.978 30	0.978 03
40	0.980 35	0.980 08	0.979 81	0.979 55	0.979 28	0.979 01	0.978 74	0.978 48	0.978 21	0.977 95

Temperature °C	Percentages of Volume at 20°C									
	16.0	16.2	16.4	16.6	16.8	17.0	17.2	17.4	17.6	17.8
10	0.980 66	0.980 47	0.980 28	0.980 09	0.979 90	0.979 71	0.979 52	0.979 34	0.979 15	0.978 97
11	0.980 56	0.980 37	0.980 17	0.979 98	0.979 78	0.979 59	0.979 40	0.979 21	0.979 03	0.978 84
12	0.980 45	0.980 26	0.980 06	0.979 87	0.979 67	0.979 48	0.979 29	0.979 09	0.978 90	0.978 70
13	0.980 36	0.980 16	0.979 96	0.979 76	0.979 56	0.979 36	0.979 16	0.978 96	0.978 77	0.978 57
14	0.980 23	0.980 03	0.979 83	0.979 63	0.979 43	0.979 23	0.979 03	0.978 83	0.978 63	0.978 43
15	0.980 12	0.979 92	0.979 71	0.979 51	0.979 30	0.979 10	0.978 90	0.978 70	0.978 50	0.978 30
16	0.980 03	0.979 82	0.979 61	0.979 41	0.979 20	0.978 99	0.978 78	0.978 58	0.978 37	0.978 17
17	0.979 92	0.979 71	0.979 50	0.979 29	0.979 08	0.978 87	0.978 66	0.978 45	0.978 25	0.978 04
18	0.979 82	0.979 61	0.979 40	0.979 18	0.978 97	0.978 76	0.978 55	0.978 34	0.978 13	0.977 92
19	0.979 72	0.979 50	0.979 29	0.979 07	0.978 86	0.978 64	0.978 43	0.978 21	0.978 00	0.977 78
20	0.979 61	0.979 39	0.979 18	0.978 96	0.978 75	0.978 53	0.978 31	0.978 10	0.977 88	0.977 67
21	0.979 51	0.979 29	0.979 07	0.978 84	0.978 62	0.978 40	0.978 18	0.977 96	0.977 75	0.977 53
22	0.979 41	0.979 19	0.978 96	0.978 74	0.978 51	0.978 29	0.978 07	0.977 85	0.977 63	0.977 41
23	0.979 31	0.979 08	0.978 85	0.978 63	0.978 40	0.978 17	0.977 95	0.977 72	0.977 50	0.977 27
24	0.979 21	0.978 98	0.978 75	0.978 53	0.978 30	0.978 07	0.977 84	0.977 61	0.977 39	0.977 16
25	0.979 12	0.978 89	0.978 66	0.978 42	0.978 19	0.977 96	0.977 73	0.977 50	0.977 27	0.977 04
26	0.979 01	0.978 78	0.978 55	0.978 31	0.978 08	0.977 85	0.977 62	0.977 38	0.977 15	0.976 91
27	0.978 91	0.978 67	0.978 44	0.978 20	0.977 97	0.977 73	0.977 49	0.977 26	0.977 02	0.976 79
28	0.978 82	0.978 58	0.978 34	0.978 10	0.977 86	0.977 62	0.977 38	0.977 15	0.976 91	0.976 68
29	0.978 72	0.978 48	0.978 24	0.978 00	0.977 76	0.977 52	0.977 28	0.977 04	0.976 79	0.976 55
30	0.978 61	0.978 37	0.978 13	0.977 88	0.977 64	0.977 40	0.977 16	0.976 91	0.976 67	0.976 42
31	0.978 52	0.978 27	0.978 03	0.977 78	0.977 54	0.977 29	0.977 04	0.976 80	0.976 55	0.976 31
32	0.978 43	0.978 18	0.977 93	0.977 69	0.977 44	0.977 19	0.976 94	0.976 69	0.976 45	0.976 20
33	0.978 33	0.978 08	0.977 83	0.977 57	0.977 32	0.977 07	0.976 82	0.976 57	0.976 33	0.976 08
34	0.978 23	0.977 98	0.977 73	0.977 47	0.977 22	0.976 97	0.976 72	0.976 47	0.976 21	0.975 96
35	0.978 14	0.977 89	0.977 63	0.977 38	0.977 12	0.976 87	0.976 61	0.976 36	0.976 10	0.975 85
36	0.978 05	0.977 79	0.977 53	0.977 28	0.977 02	0.976 76	0.976 50	0.976 24	0.975 99	0.975 73
37	0.977 95	0.977 69	0.977 43	0.977 17	0.976 91	0.976 65	0.976 39	0.976 13	0.975 87	0.975 61
38	0.977 86	0.977 60	0.977 34	0.977 07	0.976 81	0.976 55	0.976 29	0.976 03	0.975 76	0.975 50
39	0.977 77	0.977 51	0.977 24	0.976 98	0.976 71	0.976 45	0.976 19	0.975 92	0.975 66	0.975 39
40	0.977 68	0.977 41	0.977 15	0.976 88	0.976 62	0.976 35	0.976 08	0.975 81	0.975 55	0.975 28

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	18.0	18.2	18.4	18.6	18.8	19.0	19.2	19.4	19.6	19.8
10	0.978 78	0.978 60	0.978 41	0.978 23	0.978 04	0.977 86	0.977 68	0.977 50	0.977 31	0.977 13
11	0.978 65	0.978 46	0.978 27	0.978 09	0.977 90	0.977 71	0.977 52	0.977 34	0.977 15	0.976 97
12	0.978 51	0.978 32	0.978 13	0.977 94	0.977 75	0.977 56	0.977 37	0.977 18	0.976 98	0.976 79
13	0.978 37	0.978 18	0.977 98	0.977 79	0.977 59	0.977 40	0.977 21	0.977 01	0.976 82	0.976 62
14	0.978 23	0.978 03	0.977 84	0.977 64	0.977 45	0.977 25	0.977 05	0.976 86	0.976 66	0.976 47
15	0.978 10	0.977 90	0.977 70	0.977 49	0.977 29	0.977 09	0.976 89	0.976 69	0.976 49	0.976 29
16	0.977 96	0.977 76	0.977 55	0.977 35	0.977 14	0.976 94	0.976 74	0.976 54	0.976 33	0.976 13
17	0.977 83	0.977 62	0.977 42	0.977 21	0.977 01	0.976 80	0.976 59	0.976 38	0.976 18	0.975 97
18	0.977 71	0.977 50	0.977 29	0.977 07	0.976 86	0.976 65	0.976 44	0.976 23	0.976 03	0.975 82
19	0.977 57	0.977 36	0.977 15	0.976 93	0.976 72	0.976 51	0.976 30	0.976 09	0.975 87	0.975 66
20	0.977 45	0.977 23	0.977 01	0.976 80	0.976 58	0.976 36	0.976 15	0.975 93	0.975 72	0.975 50
21	0.977 31	0.977 09	0.976 87	0.976 66	0.976 44	0.976 22	0.976 00	0.975 78	0.975 56	0.975 34
22	0.977 19	0.976 97	0.976 74	0.976 52	0.976 29	0.976 07	0.975 85	0.975 63	0.975 41	0.975 19
23	0.977 05	0.976 83	0.976 61	0.976 38	0.976 16	0.975 94	0.975 71	0.975 49	0.975 26	0.975 04
24	0.976 93	0.976 70	0.976 48	0.976 25	0.976 03	0.975 80	0.975 57	0.975 34	0.975 12	0.974 89
25	0.976 81	0.976 58	0.976 35	0.976 12	0.975 89	0.975 66	0.975 43	0.975 20	0.974 97	0.974 74
26	0.976 68	0.976 45	0.976 22	0.975 98	0.975 75	0.975 52	0.975 29	0.975 05	0.974 82	0.974 58
27	0.976 55	0.976 32	0.976 08	0.975 85	0.975 61	0.975 38	0.975 14	0.974 91	0.974 67	0.974 44
28	0.976 44	0.976 20	0.975 96	0.975 72	0.975 48	0.975 24	0.975 00	0.974 77	0.974 53	0.974 30
29	0.976 31	0.976 07	0.975 83	0.975 59	0.975 35	0.975 11	0.974 87	0.974 63	0.974 39	0.974 15
30	0.976 18	0.975 94	0.975 70	0.975 45	0.975 21	0.974 97	0.974 73	0.974 48	0.974 24	0.973 99
31	0.976 06	0.975 82	0.975 57	0.975 33	0.975 08	0.974 84	0.974 59	0.974 34	0.974 10	0.973 85
32	0.975 95	0.975 70	0.975 45	0.975 21	0.974 96	0.974 71	0.974 46	0.974 21	0.973 96	0.973 71
33	0.975 83	0.975 58	0.975 33	0.975 07	0.974 82	0.974 57	0.974 32	0.974 07	0.973 81	0.973 56
34	0.975 71	0.975 46	0.975 20	0.974 95	0.974 69	0.974 44	0.974 18	0.973 93	0.973 67	0.973 42
35	0.975 59	0.975 33	0.975 08	0.974 82	0.974 57	0.974 31	0.974 05	0.973 79	0.973 54	0.973 28
36	0.975 47	0.975 21	0.974 95	0.974 70	0.974 44	0.974 18	0.973 92	0.973 66	0.973 40	0.973 14
37	0.975 35	0.975 09	0.974 83	0.974 56	0.974 30	0.974 04	0.973 78	0.973 52	0.973 25	0.972 99
38	0.975 24	0.974 98	0.974 71	0.974 45	0.974 18	0.973 92	0.973 66	0.973 39	0.973 13	0.972 86
39	0.975 13	0.974 86	0.974 59	0.974 33	0.974 06	0.973 79	0.973 52	0.973 26	0.972 99	0.972 73
40	0.975 01	0.974 74	0.974 47	0.974 21	0.973 94	0.973 67	0.973 40	0.973 13	0.972 86	0.972 59

Temperature °C	Percentages of Volume at 20°C									
	20.0	20.2	20.4	20.6	20.8	21.0	21.2	21.4	21.6	21.8
10	0.976 95	0.976 77	0.976 59	0.976 40	0.976 22	0.976 04	0.975 86	0.975 68	0.975 49	0.975 31
11	0.976 78	0.976 59	0.976 41	0.976 22	0.976 04	0.975 85	0.975 66	0.975 48	0.975 29	0.975 11
12	0.976 60	0.976 41	0.976 22	0.976 04	0.975 85	0.975 66	0.975 47	0.975 28	0.975 09	0.974 90
13	0.976 43	0.976 24	0.976 05	0.975 85	0.975 66	0.975 47	0.975 28	0.975 09	0.974 89	0.974 70
14	0.976 27	0.976 07	0.975 88	0.975 68	0.975 49	0.975 29	0.975 09	0.974 89	0.974 70	0.974 50
15	0.976 09	0.975 89	0.975 69	0.975 49	0.975 29	0.975 09	0.974 89	0.974 69	0.974 49	0.974 29
16	0.975 93	0.975 73	0.975 53	0.975 32	0.975 12	0.974 92	0.974 72	0.974 51	0.974 31	0.974 10
17	0.975 76	0.975 56	0.975 35	0.975 15	0.974 94	0.974 74	0.974 53	0.974 32	0.974 12	0.973 91
18	0.975 61	0.975 40	0.975 19	0.974 98	0.974 77	0.974 56	0.974 35	0.974 14	0.973 93	0.973 72
19	0.975 45	0.975 24	0.975 02	0.974 81	0.974 59	0.974 38	0.974 17	0.973 96	0.973 74	0.973 53
20	0.975 29	0.975 07	0.974 86	0.974 64	0.974 43	0.974 21	0.973 99	0.973 77	0.973 56	0.973 34
21	0.975 12	0.974 90	0.974 68	0.974 47	0.974 25	0.974 03	0.973 81	0.973 59	0.973 38	0.973 16
22	0.974 97	0.974 75	0.974 53	0.974 30	0.974 08	0.973 86	0.973 64	0.973 41	0.973 19	0.972 96
23	0.974 81	0.974 59	0.974 36	0.974 14	0.973 91	0.973 69	0.973 46	0.973 23	0.973 01	0.972 78
24	0.974 66	0.974 43	0.974 20	0.973 98	0.973 75	0.973 52	0.973 29	0.973 06	0.972 84	0.972 61
25	0.974 51	0.974 28	0.974 05	0.973 81	0.973 58	0.973 35	0.973 12	0.972 89	0.972 66	0.972 43
26	0.974 35	0.974 12	0.973 89	0.973 65	0.973 42	0.973 19	0.972 95	0.972 72	0.972 48	0.972 25
27	0.974 20	0.973 96	0.973 73	0.973 49	0.973 26	0.973 02	0.972 78	0.972 54	0.972 31	0.972 07
28	0.974 06	0.973 82	0.973 58	0.973 34	0.973 10	0.972 86	0.972 62	0.972 38	0.972 13	0.971 89
29	0.973 91	0.973 67	0.973 42	0.973 18	0.972 93	0.972 69	0.972 45	0.972 20	0.971 96	0.971 71
30	0.973 75	0.973 50	0.973 26	0.973 01	0.972 77	0.972 52	0.972 27	0.972 03	0.971 78	0.971 54
31	0.973 60	0.973 35	0.973 10	0.972 86	0.972 61	0.972 36	0.972 11	0.971 86	0.971 62	0.971 37
32	0.973 46	0.973 21	0.972 96	0.972 70	0.972 45	0.972 20	0.971 95	0.971 70	0.971 45	0.971 20
33	0.973 31	0.973 06	0.972 80	0.972 55	0.972 29	0.972 04	0.971 78	0.971 53	0.971 27	0.971 02
34	0.973 16	0.972 90	0.972 65	0.972 39	0.972 14	0.971 88	0.971 62	0.971 36	0.971 10	0.970 84
35	0.973 02	0.972 76	0.972 50	0.972 24	0.971 98	0.971 72	0.971 46	0.971 20	0.970 93	0.970 67
36	0.972 88	0.972 62	0.972 36	0.972 09	0.971 83	0.971 57	0.971 31	0.971 04	0.970 78	0.970 51
37	0.972 73	0.972 47	0.972 20	0.971 94	0.971 67	0.971 41	0.971 14	0.970 87	0.970 61	0.970 34
38	0.972 60	0.972 33	0.972 06	0.971 80	0.971 53	0.971 26	0.970 99	0.970 72	0.970 45	0.970 18
39	0.972 46	0.972 19	0.971 92	0.971 65	0.971 38	0.971 11	0.970 83	0.970 56	0.970 28	0.970 01
40	0.972 32	0.972 05	0.971 77	0.971 50	0.971 22	0.970 95	0.970 67	0.970 40	0.970 12	0.969 85

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	22.0	22.2	22.4	22.6	22.8	23.0	23.2	23.4	23.6	23.8
10	0.975 13	0.974 95	0.974 77	0.974 58	0.974 40	0.974 22	0.974 03	0.973 85	0.973 66	0.973 48
11	0.974 92	0.974 73	0.974 54	0.974 36	0.974 17	0.973 98	0.973 79	0.973 60	0.973 42	0.973 23
12	0.974 71	0.974 52	0.974 33	0.974 14	0.973 95	0.973 76	0.973 57	0.973 38	0.973 18	0.972 99
13	0.974 51	0.974 32	0.974 12	0.973 93	0.973 73	0.973 54	0.973 34	0.973 14	0.972 95	0.972 75
14	0.974 30	0.974 10	0.973 90	0.973 71	0.973 51	0.973 31	0.973 11	0.972 91	0.972 71	0.972 51
15	0.974 09	0.973 89	0.973 69	0.973 49	0.973 29	0.973 09	0.972 89	0.972 68	0.972 48	0.972 27
16	0.973 90	0.973 69	0.973 49	0.973 28	0.973 08	0.972 87	0.972 66	0.972 46	0.972 25	0.972 05
17	0.973 70	0.973 49	0.973 28	0.973 08	0.972 87	0.972 66	0.972 45	0.972 24	0.972 03	0.971 82
18	0.973 51	0.973 30	0.973 09	0.972 87	0.972 66	0.972 45	0.972 24	0.972 02	0.971 81	0.971 59
19	0.973 32	0.973 11	0.972 89	0.972 68	0.972 46	0.972 25	0.972 03	0.971 81	0.971 59	0.971 37
20	0.973 12	0.972 90	0.972 68	0.972 47	0.972 25	0.972 03	0.971 81	0.971 59	0.971 37	0.971 15
21	0.972 94	0.972 72	0.972 49	0.972 27	0.972 04	0.971 82	0.971 60	0.971 38	0.971 15	0.970 93
22	0.972 74	0.972 52	0.972 29	0.972 07	0.971 84	0.971 62	0.971 39	0.971 16	0.970 94	0.970 71
23	0.972 55	0.972 32	0.972 10	0.971 87	0.971 65	0.971 42	0.971 19	0.970 96	0.970 73	0.970 50
24	0.972 38	0.972 15	0.971 92	0.971 68	0.971 45	0.971 22	0.970 99	0.970 76	0.970 52	0.970 29
25	0.972 20	0.971 96	0.971 73	0.971 49	0.971 26	0.971 02	0.970 78	0.970 55	0.970 31	0.970 08
26	0.972 01	0.971 77	0.971 54	0.971 30	0.971 07	0.970 83	0.970 59	0.970 35	0.970 10	0.969 86
27	0.971 83	0.971 59	0.971 35	0.971 11	0.970 87	0.970 63	0.970 39	0.970 14	0.969 90	0.969 65
28	0.971 65	0.971 41	0.971 16	0.970 92	0.970 67	0.970 43	0.970 18	0.969 94	0.969 69	0.969 45
29	0.971 47	0.971 22	0.970 98	0.970 73	0.970 49	0.970 24	0.969 99	0.969 74	0.969 49	0.969 24
30	0.971 29	0.971 04	0.970 79	0.970 54	0.970 29	0.970 04	0.969 79	0.969 54	0.969 28	0.969 03
31	0.971 12	0.970 87	0.970 61	0.970 36	0.970 10	0.969 85	0.969 60	0.969 34	0.969 09	0.968 83
32	0.970 95	0.970 69	0.970 44	0.970 18	0.969 93	0.969 67	0.969 41	0.969 15	0.968 90	0.968 64
33	0.970 76	0.970 50	0.970 25	0.969 99	0.969 74	0.969 48	0.969 22	0.968 96	0.968 69	0.968 43
34	0.970 58	0.970 32	0.970 06	0.969 81	0.969 55	0.969 29	0.969 03	0.968 76	0.968 50	0.968 23
35	0.970 41	0.970 15	0.969 88	0.969 62	0.969 35	0.969 09	0.968 82	0.968 56	0.968 29	0.968 03
36	0.970 25	0.969 98	0.969 71	0.969 45	0.969 18	0.968 91	0.968 64	0.968 37	0.968 10	0.967 83
37	0.970 07	0.969 80	0.969 53	0.969 26	0.968 99	0.968 72	0.968 45	0.968 18	0.967 90	0.967 63
38	0.969 91	0.969 64	0.969 37	0.969 09	0.968 82	0.968 55	0.968 27	0.968 00	0.967 72	0.967 45
39	0.969 73	0.969 46	0.969 18	0.968 91	0.968 63	0.968 36	0.968 08	0.967 80	0.967 53	0.967 25
40	0.969 57	0.969 29	0.969 01	0.968 74	0.968 46	0.968 18	0.967 90	0.967 62	0.967 34	0.967 06

Temperature °C	Percentages of Volume at 20°C									
	24.0	24.2	24.4	24.6	24.8	25.0	25.2	25.4	25.6	25.8
10	0.973 29	0.973 10	0.972 91	0.972 73	0.972 54	0.972 35	0.972 16	0.971 97	0.971 78	0.971 59
11	0.973 04	0.972 85	0.972 66	0.972 47	0.972 28	0.972 09	0.971 90	0.971 70	0.971 51	0.971 31
12	0.972 80	0.972 61	0.972 41	0.972 22	0.972 02	0.971 83	0.971 63	0.971 43	0.971 23	0.971 03
13	0.972 55	0.972 35	0.972 15	0.971 96	0.971 76	0.971 56	0.971 36	0.971 16	0.970 95	0.970 75
14	0.972 31	0.972 11	0.971 91	0.971 70	0.971 50	0.971 30	0.971 10	0.970 89	0.970 69	0.970 48
15	0.972 07	0.971 86	0.971 66	0.971 45	0.971 25	0.971 04	0.970 83	0.970 62	0.970 41	0.970 20
16	0.971 84	0.971 63	0.971 42	0.971 21	0.971 00	0.970 79	0.970 58	0.970 37	0.970 15	0.969 94
17	0.971 61	0.971 40	0.971 18	0.970 97	0.970 75	0.970 54	0.970 32	0.970 11	0.969 89	0.969 68
18	0.971 38	0.971 16	0.970 95	0.970 73	0.970 52	0.970 30	0.970 08	0.969 86	0.969 63	0.969 41
19	0.971 15	0.970 93	0.970 71	0.970 49	0.970 27	0.970 05	0.969 83	0.969 61	0.969 38	0.969 16
20	0.970 93	0.970 71	0.970 48	0.970 26	0.970 03	0.969 81	0.969 58	0.969 36	0.969 13	0.968 91
21	0.970 71	0.970 48	0.970 25	0.970 03	0.969 80	0.969 57	0.969 34	0.969 11	0.968 88	0.968 65
22	0.970 48	0.970 25	0.970 02	0.969 79	0.969 56	0.969 33	0.969 10	0.968 87	0.968 63	0.968 40
23	0.970 27	0.970 04	0.969 80	0.969 57	0.969 33	0.969 10	0.968 86	0.968 62	0.968 39	0.968 15
24	0.970 06	0.969 82	0.969 58	0.969 35	0.969 11	0.968 87	0.968 63	0.968 39	0.968 15	0.967 91
25	0.969 84	0.969 60	0.969 36	0.969 12	0.968 88	0.968 64	0.968 40	0.968 15	0.967 91	0.967 66
26	0.969 62	0.969 38	0.969 14	0.968 89	0.968 65	0.968 41	0.968 16	0.967 92	0.967 67	0.967 43
27	0.969 41	0.969 17	0.968 92	0.968 68	0.968 43	0.968 19	0.967 94	0.967 69	0.967 43	0.967 18
28	0.969 20	0.968 95	0.968 70	0.968 46	0.968 21	0.967 96	0.967 71	0.967 45	0.967 20	0.966 94
29	0.968 99	0.968 74	0.968 49	0.968 24	0.967 99	0.967 74	0.967 48	0.967 23	0.966 97	0.966 72
30	0.968 78	0.968 52	0.968 27	0.968 01	0.967 76	0.967 50	0.967 24	0.966 98	0.966 73	0.966 47
31	0.968 58	0.968 32	0.968 06	0.967 80	0.967 54	0.967 28	0.967 02	0.966 76	0.966 50	0.966 24
32	0.968 38	0.968 12	0.967 86	0.967 59	0.967 33	0.967 07	0.966 80	0.966 54	0.966 27	0.966 01
33	0.968 17	0.967 91	0.967 64	0.967 38	0.967 11	0.966 85	0.966 58	0.966 31	0.966 05	0.965 78
34	0.967 97	0.967 70	0.967 43	0.967 17	0.966 90	0.966 63	0.966 36	0.966 09	0.965 82	0.965 55
35	0.967 76	0.967 49	0.967 22	0.966 95	0.966 68	0.966 41	0.966 14	0.965 86	0.965 59	0.965 31
36	0.967 56	0.967 29	0.967 02	0.966 74	0.966 47	0.966 20	0.965 92	0.965 65	0.965 37	0.965 10
37	0.967 36	0.967 08	0.966 81	0.966 53	0.966 26	0.965 98	0.965 70	0.965 42	0.965 15	0.964 87
38	0.967 17	0.966 89	0.966 61	0.966 33	0.966 05	0.965 77	0.965 49	0.965 21	0.964 92	0.964 64
39	0.966 97	0.966 69	0.966 41	0.966 13	0.965 85	0.965 57	0.965 28	0.965 00	0.964 71	0.964 43
40	0.966 78	0.966 49	0.966 21	0.965 92	0.965 64	0.965 35	0.965 06	0.964 77	0.964 49	0.964 20

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures—*Contd*

Temperature °C	Percentages of Volume at 20°C									
	26.0	26.2	26.4	26.6	26.8	27.0	27.2	27.4	27.6	27.8
10	0.971 40	0.971 21	0.971 02	0.970 82	0.970 63	0.970 44	0.970 24	0.970 04	0.969 84	0.969 64
11	0.971 12	0.970 92	0.970 72	0.970 53	0.970 33	0.970 13	0.969 93	0.969 73	0.969 52	0.969 32
12	0.970 83	0.970 63	0.970 43	0.970 22	0.970 02	0.969 82	0.969 61	0.969 41	0.969 20	0.969 00
13	0.970 55	0.970 35	0.970 14	0.969 94	0.969 73	0.969 53	0.969 32	0.969 11	0.968 89	0.968 68
14	0.970 28	0.970 07	0.969 86	0.969 64	0.969 43	0.969 22	0.969 01	0.968 79	0.968 58	0.968 36
15	0.969 99	0.969 78	0.969 57	0.969 35	0.969 14	0.968 93	0.968 71	0.968 49	0.968 28	0.968 06
16	0.969 73	0.969 51	0.969 29	0.969 08	0.968 86	0.968 64	0.968 42	0.968 20	0.967 97	0.967 75
17	0.969 46	0.969 24	0.969 02	0.968 80	0.968 58	0.968 36	0.968 14	0.967 91	0.967 69	0.967 46
18	0.969 19	0.968 97	0.968 75	0.968 52	0.968 30	0.968 08	0.967 85	0.967 62	0.967 39	0.967 16
19	0.968 94	0.968 71	0.968 48	0.968 25	0.968 02	0.967 79	0.967 56	0.967 33	0.967 10	0.966 87
20	0.968 68	0.968 45	0.968 22	0.967 98	0.967 75	0.967 52	0.967 28	0.967 05	0.966 81	0.966 58
21	0.968 42	0.968 19	0.967 95	0.967 72	0.967 48	0.967 25	0.967 01	0.966 77	0.966 54	0.966 30
22	0.968 17	0.967 93	0.967 69	0.967 45	0.967 21	0.966 97	0.966 73	0.966 49	0.966 25	0.966 01
23	0.967 91	0.967 67	0.967 43	0.967 18	0.966 94	0.966 70	0.966 46	0.966 21	0.965 97	0.965 72
24	0.967 67	0.967 43	0.967 18	0.966 94	0.966 69	0.966 45	0.966 20	0.965 95	0.965 71	0.965 46
25	0.967 42	0.967 17	0.966 92	0.966 68	0.966 43	0.966 18	0.965 93	0.965 68	0.965 42	0.965 17
26	0.967 18	0.966 93	0.966 68	0.966 42	0.966 17	0.965 92	0.965 67	0.965 41	0.965 16	0.964 90
27	0.966 93	0.966 68	0.966 42	0.966 17	0.965 91	0.965 66	0.965 40	0.965 14	0.964 89	0.964 63
28	0.966 69	0.966 43	0.966 17	0.965 92	0.965 66	0.965 40	0.965 14	0.964 88	0.964 62	0.964 36
29	0.966 46	0.966 20	0.965 94	0.965 67	0.965 41	0.965 15	0.964 89	0.964 63	0.964 36	0.964 10
30	0.966 21	0.965 95	0.965 68	0.965 42	0.965 15	0.964 89	0.964 62	0.964 35	0.964 09	0.963 82
31	0.965 98	0.965 71	0.965 45	0.965 18	0.964 92	0.964 65	0.964 38	0.964 11	0.963 83	0.963 56
32	0.965 74	0.965 47	0.965 21	0.964 94	0.964 68	0.964 41	0.964 14	0.963 86	0.963 59	0.963 31
33	0.965 51	0.965 24	0.964 97	0.964 69	0.964 42	0.964 15	0.963 87	0.963 60	0.963 32	0.963 05
34	0.965 28	0.965 00	0.964 73	0.964 45	0.964 18	0.963 90	0.963 62	0.963 34	0.963 07	0.962 79
35	0.965 04	0.964 76	0.964 49	0.964 21	0.963 94	0.963 66	0.963 38	0.963 10	0.962 81	0.962 53
36	0.964 82	0.964 54	0.964 26	0.963 98	0.963 70	0.963 42	0.963 13	0.962 85	0.962 56	0.962 28
37	0.964 59	0.964 31	0.964 02	0.963 74	0.963 45	0.963 17	0.962 88	0.962 59	0.962 31	0.962 02
38	0.964 36	0.964 07	0.963 79	0.963 50	0.963 22	0.962 93	0.962 64	0.962 35	0.962 06	0.961 77
39	0.964 14	0.963 85	0.963 56	0.963 27	0.962 98	0.962 69	0.962 40	0.962 10	0.961 81	0.961 51
40	0.963 91	0.963 62	0.963 33	0.963 04	0.962 75	0.962 46	0.962 16	0.961 87	0.961 57	0.961 28

Temperature °C	Percentages of Volume at 20°C									
	28.0	28.2	28.4	28.6	28.8	29.0	29.2	29.4	29.6	29.8
10	0.969 44	0.969 24	0.969 03	0.968 83	0.968 62	0.968 42	0.968 21	0.968 00	0.967 80	0.967 59
11	0.969 12	0.968 91	0.968 70	0.968 49	0.968 28	0.968 07	0.967 86	0.967 64	0.967 43	0.967 21
12	0.968 79	0.968 58	0.968 37	0.968 15	0.967 94	0.967 73	0.967 51	0.967 30	0.967 08	0.966 87
13	0.968 47	0.968 26	0.968 04	0.967 83	0.967 61	0.967 40	0.967 18	0.966 95	0.966 73	0.966 50
14	0.968 15	0.967 93	0.967 71	0.967 50	0.967 28	0.967 06	0.966 83	0.966 61	0.966 38	0.966 16
15	0.967 84	0.967 62	0.967 40	0.967 17	0.966 95	0.966 73	0.966 50	0.966 27	0.966 03	0.965 80
16	0.967 53	0.967 30	0.967 08	0.966 85	0.966 63	0.966 40	0.966 17	0.965 94	0.965 70	0.965 47
17	0.967 24	0.967 01	0.966 78	0.966 54	0.966 31	0.966 08	0.965 84	0.965 61	0.965 37	0.965 14
18	0.966 93	0.966 70	0.966 47	0.966 23	0.966 00	0.965 77	0.965 53	0.965 29	0.965 04	0.964 80
19	0.966 64	0.966 40	0.966 16	0.965 93	0.965 69	0.965 45	0.965 21	0.964 97	0.964 72	0.964 48
20	0.966 34	0.966 10	0.965 86	0.965 62	0.965 38	0.965 14	0.964 89	0.964 65	0.964 40	0.964 16
21	0.966 06	0.965 81	0.965 57	0.965 32	0.965 08	0.964 83	0.964 58	0.964 33	0.964 08	0.963 83
22	0.965 77	0.965 52	0.965 27	0.965 02	0.964 77	0.964 52	0.964 27	0.964 02	0.963 76	0.963 51
23	0.965 48	0.965 23	0.964 98	0.964 72	0.964 47	0.964 22	0.963 96	0.963 71	0.963 45	0.963 20
24	0.965 21	0.964 95	0.964 70	0.964 44	0.964 19	0.963 93	0.963 67	0.963 41	0.963 16	0.962 90
25	0.964 92	0.964 66	0.964 40	0.964 15	0.963 89	0.963 63	0.963 37	0.963 11	0.962 85	0.962 59
26	0.964 65	0.964 39	0.964 13	0.963 86	0.963 60	0.963 34	0.963 08	0.962 81	0.962 55	0.962 28
27	0.964 37	0.964 11	0.963 84	0.963 58	0.963 31	0.963 05	0.962 78	0.962 52	0.962 25	0.961 99
28	0.964 10	0.963 83	0.963 57	0.963 30	0.963 04	0.962 77	0.962 50	0.962 23	0.961 95	0.961 68
29	0.963 84	0.963 57	0.963 30	0.963 08	0.962 76	0.962 49	0.962 21	0.961 94	0.961 66	0.961 39
30	0.963 55	0.963 28	0.963 01	0.962 74	0.962 47	0.962 20	0.961 92	0.961 64	0.961 37	0.961 09
31	0.963 29	0.963 01	0.962 74	0.962 46	0.962 19	0.961 91	0.961 63	0.961 35	0.961 07	0.960 79
32	0.963 04	0.962 76	0.962 48	0.962 20	0.961 92	0.961 64	0.961 36	0.961 08	0.960 79	0.960 51
33	0.962 77	0.962 49	0.962 21	0.961 93	0.961 65	0.961 37	0.961 08	0.960 80	0.960 51	0.960 23
34	0.962 51	0.962 23	0.961 94	0.961 66	0.961 37	0.961 09	0.960 80	0.960 51	0.960 22	0.959 93
35	0.962 25	0.961 96	0.961 68	0.961 39	0.961 11	0.960 82	0.960 53	0.960 24	0.959 94	0.959 65
36	0.961 99	0.961 70	0.961 41	0.961 12	0.960 83	0.960 54	0.960 25	0.959 95	0.959 66	0.959 36
37	0.961 73	0.961 44	0.961 15	0.960 85	0.960 56	0.960 27	0.959 97	0.959 67	0.959 38	0.959 08
38	0.961 48	0.961 19	0.960 89	0.960 60	0.960 30	0.960 01	0.959 71	0.959 41	0.959 10	0.958 80
39	0.961 22	0.960 92	0.960 63	0.960 33	0.960 04	0.959 74	0.959 44	0.959 14	0.958 83	0.958 53
40	0.960 98	0.960 68	0.960 38	0.960 07	0.959 77	0.959 47	0.959 17	0.958 86	0.958 56	0.958 25

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	30.0	30.2	30.4	30.6	30.8	31.0	31.2	31.4	31.6	31.8
10	0.967 38	0.967 16	0.966 94	0.966 73	0.966 51	0..966 29	0.966 07	0.965 84	0.965 62	0.965 39
11	0.967 00	0.966 78	0.966 56	0.966 35	0.966 13	0.965 91	0.965 68	0.965 45	0.965 23	0.965 00
12	0.966 65	0.966 43	0.966 20	0.965 98	0.965 75	0.965 53	0.965 30	0.965 07	0.964 83	0.964 60
13	0.966 28	0.966 05	0.965 83	0.965 60	0.965 38	0.965 15	0.964 91	0.964 68	0.964 44	0.964 21
14	0.965 93	0.965 70	0.965 47	0.965 24	0.965 01	0.964 78	0.964 54	0.964 30	0.964 06	0.963 82
15	0.965 57	0.965 34	0.965 10	0.964 87	0.964 63	0.964 40	0.964 16	0.963 92	0.963 67	0.963 43
16	0.965 24	0.965 00	0.964 76	0.964 52	0.964 28	0.964 04	0.963 80	0.963 55	0.963 31	0.963 06
17	0.964 90	0.964 66	0.964 42	0.964 17	0.963 93	0.963 69	0.963 44	0.963 19	0.962 94	0.962 69
18	0.964 56	0.964 32	0.964 07	0.963 83	0.963 58	0.963 34	0.963 09	0.962 84	0.962 58	0.962 33
19	0.964 24	0.963 99	0.963 74	0.963 49	0.963 24	0.962 99	0.962 73	0.962 48	0.962 22	0.961 97
20	0.963 91	0.963 66	0.963 40	0.963 15	0.962 89	0.962 64	0.962 38	0.962 12	0.961 87	0.961 61
21	0.963 58	0.963 33	0.963 07	0.962 82	0.962 56	0.962 31	0.962 05	0.961 78	0.961 52	0.961 25
22	0.963 26	0.963 00	0.962 74	0.962 49	0.962 23	0.961 97	0.961 70	0.961 44	0.961 17	0.960 91
23	0.962 94	0.962 68	0.962 42	0.962 16	0.961 90	0.961 64	0.961 37	0.961 10	0.960 83	0.960 56
24	0.962 64	0.962 37	0.962 11	0.961 84	0.961 58	0.961 31	0.961 04	0.960 77	0.960 50	0.960 23
25	0.962 33	0.962 06	0.961 79	0.961 52	0.961 25	0.960 98	0.960 71	0.960 44	0.960 16	0.959 89
26	0.962 02	0.961 75	0.961 48	0.961 20	0.960 93	0.960 66	0.960 38	0.960 11	0.959 83	0.959 56
27	0.961 72	0.961 44	0.961 17	0.960 89	0.960 62	0.960 34	0.960 06	0.959 78	0.959 50	0.959 22
28	0.961 41	0.961 13	0.960 86	0.960 58	0.960 31	0.960 03	0.959 75	0.959 46	0.959 18	0.958 89
29	0.961 11	0.960 83	0.960 55	0.960 27	0.959 99	0.959 71	0.959 42	0.959 14	0.958 85	0.958 57
30	0.960 81	0.960 53	0.960 24	0.959 96	0.959 67	0.959 39	0.959 10	0.958 81	0.958 52	0.958 23
31	0.960 51	0.960 23	0.959 94	0.959 66	0.959 37	0.959 09	0.958 80	0.958 51	0.958 21	0.957 92
32	0.960 23	0.959 94	0.959 65	0.959 36	0.959 07	0.958 78	0.958 49	0.958 19	0.957 90	0.957 60
33	0.959 94	0.959 65	0.959 36	0.959 06	0.958 77	0.958 48	0.958 18	0.957 88	0.957 59	0.957 29
34	0.959 64	0.959 35	0.959 05	0.958 76	0.958 46	0.958 17	0.957 87	0.957 57	0.957 27	0.956 97
35	0.959 36	0.959 06	0.958 76	0.958 47	0.958 17	0.957 87	0.957 57	0.957 27	0.956 96	0.956 66
36	0.959 07	0.958 77	0.958 47	0.958 18	0.957 88	0.957 58	0.957 27	0.956 97	0.956 66	0.956 36
37	0.958 78	0.958 48	0.958 18	0.957 87	0.957 57	0.957 27	0.956 96	0.956 66	0.956 35	0.956 05
38	0.958 50	0.958 20	0.957 89	0.957 59	0.957 28	0.956 98	0.956 67	0.956 36	0.956 05	0.955 74
39	0.958 23	0.957 92	0.957 61	0.957 31	0.957 00	0.956 69	0.956 38	0.956 07	0.955 75	0.955 44
40	0.957 95	0.957 64	0.957 33	0.957 01	0.956 70	0.956 39	0.956 08	0.955 76	0.955 45	0.955 13

Temperature °C	Percentages of Volume at 20°C									
	32.0	32.2	32.4	32.6	32.8	33.0	33.2	33.4	33.6	33.8
10	0.965 17	0.964 94	0.964 71	0.964 48	0.964 25	0.964 02	0.963 78	0.963 54	0.963 31	0.963 07
11	0.964 77	0.964 54	0.964 30	0.964 07	0.963 83	0.963 60	0.963 36	0.963 12	0.962 87	0.962 63
12	0.964 37	0.964 13	0.963 89	0.963 66	0.963 42	0.963 18	0.962 93	0.962 69	0.962 44	0.962 20
13	0.963 97	0.963 73	0.963 49	0.963 25	0.963 01	0.962 77	0.962 52	0.962 27	0.962 02	0.961 77
14	0.963 58	0.963 33	0.963 09	0.962 84	0.962 60	0.962 35	0.962 10	0.961 85	0.961 59	0.961 34
15	0.963 19	0.962 94	0.962 69	0.962 45	0.962 20	0.961 95	0.961 69	0.961 43	0.961 18	0.960 92
16	0.962 82	0.962 57	0.962 32	0.962 06	0.961 81	0.961 56	0.961 30	0.961 04	0.960 78	0.960 52
17	0.962 44	0.962 19	0.961 93	0.961 68	0.961 42	0.961 17	0.960 91	0.960 64	0.960 38	0.960 11
18	0.962 08	0.961 82	0.961 56	0.961 30	0.961 04	0.960 78	0.960 51	0.960 25	0.959 98	0.959 72
19	0.961 71	0.961 45	0.961 19	0.960 93	0.960 67	0.960 41	0.960 14	0.959 87	0.959 59	0.959 32
20	0.961 35	0.961 09	0.960 82	0.960 56	0.960 29	0.960 03	0.959 76	0.959 48	0.959 21	0.958 93
21	0.960 99	0.960 72	0.960 46	0.960 19	0.959 93	0.959 66	0.959 38	0.959 10	0.958 83	0.958 55
22	0.960 64	0.960 37	0.960 10	0.959 83	0.959 56	0.959 29	0.959 01	0.958 73	0.958 45	0.958 17
23	0.960 29	0.960 02	0.959 74	0.959 47	0.959 19	0.958 92	0.958 64	0.958 36	0.958 07	0.957 79
24	0.959 96	0.959 68	0.959 40	0.959 12	0.958 84	0.958 56	0.958 28	0.958 00	0.957 71	0.957 43
25	0.959 62	0.959 34	0.959 06	0.958 77	0.958 49	0.958 21	0.957 92	0.957 64	0.957 35	0.957 07
26	0.959 28	0.959 00	0.958 71	0.958 43	0.958 14	0.957 86	0.957 57	0.957 28	0.956 98	0.956 69
27	0.958 94	0.958 65	0.958 37	0.958 08	0.957 80	0.957 51	0.957 22	0.956 92	0.956 63	0.956 33
28	0.958 61	0.958 32	0.958 03	0.957 74	0.957 45	0.957 16	0.956 87	0.956 57	0.956 28	0.955 98
29	0.958 28	0.957 99	0.957 70	0.957 40	0.957 11	0.956 82	0.956 52	0.956 22	0.955 93	0.955 63
30	0.957 94	0.957 65	0.957 36	0.957 06	0.956 77	0.956 48	0.956 18	0.955 88	0.955 57	0.955 27
31	0.957 63	0.957 33	0.957 03	0.956 74	0.956 44	0.956 14	0.955 84	0.955 53	0.955 23	0.954 92
32	0.957 31	0.957 01	0.956 71	0.956 41	0.956 11	0.955 81	0.955 50	0.955 20	0.954 89	0.954 59
33	0.956 99	0.956 69	0.956 39	0.956 08	0.955 78	0.955 48	0.955 17	0.954 86	0.954 55	0.954 24
34	0.956 67	0.956 37	0.956 06	0.955 76	0.955 45	0.955 15	0.954 84	0.954 53	0.954 21	0.953 90
35	0.956 36	0.956 05	0.955 74	0.955 44	0.955 13	0.954 82	0.954 51	0.954 19	0.953 88	0.953 56
36	0.956 05	0.955 74	0.955 43	0.955 12	0.954 81	0.954 50	0.954 18	0.953 86	0.953 55	0.953 23
37	0.955 74	0.955 43	0.955 11	0.954 80	0.954 48	0.954 17	0.953 85	0.953 53	0.953 21	0.952 89
38	0.955 43	0.955 12	0.954 80	0.954 49	0.954 17	0.953 86	0.953 54	0.953 22	0.952 89	0.952 57
39	0.955 13	0.954 81	0.954 49	0.954 18	0.953 86	0.953 54	0.953 22	0.952 89	0.952 57	0.952 24
40	0.954 82	0.954 50	0.954 18	0.953 87	0.953 55	0.953 23	0.952 90	0.952 58	0.952 25	0.951 93

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	34.0	34.2	34.4	34.6	34.8	35.0	35.2	35.4	35.6	35.8
10	0.962 83	0.962 58	0.962 33	0.962 09	0.961 84	0.961 59	0.961 34	0.961 08	0.960 83	0.960 57
11	0.962 39	0.962 14	0.961 89	0.961 63	0.961 38	0.961 13	0.960 87	0.960 61	0.960 36	0.960 10
12	0.961 95	0.961 70	0.961 44	0.961 19	0.960 93	0.960 68	0.960 42	0.960 16	0.959 89	0.959 63
13	0.961 52	0.961 26	0.961 00	0.960 75	0.960 49	0.960 23	0.959 96	0.959 70	0.959 43	0.959 17
14	0.961 09	0.960 83	0.960 57	0.960 31	0.960 05	0.959 79	0.959 52	0.959 25	0.958 99	0.958 72
15	0.960 66	0.960 40	0.960 14	0.959 87	0.959 61	0.959 35	0.959 08	0.958 81	0.958 53	0.958 26
16	0.960 26	0.959 99	0.959 72	0.959 46	0.959 19	0.958 92	0.958 65	0.958 37	0.958 10	0.957 82
17	0.959 85	0.959 58	0.959 31	0.959 05	0.958 78	0.958 51	0.958 23	0.957 95	0.957 67	0.957 39
18	0.959 45	0.959 18	0.958 91	0.958 63	0.958 36	0.958 09	0.957 81	0.957 52	0.957 24	0.956 95
19	0.959 05	0.958 77	0.958 50	0.958 22	0.957 95	0.957 67	0.957 39	0.957 10	0.956 82	0.956 53
20	0.958 66	0.958 38	0.958 10	0.957 83	0.957 55	0.957 27	0.956 98	0.956 69	0.956 40	0.956 11
21	0.958 27	0.957 99	0.957 71	0.957 42	0.957 14	0.956 86	0.956 57	0.956 28	0.955 99	0.955 70
22	0.957 89	0.957 61	0.957 32	0.957 04	0.956 75	0.956 47	0.956 18	0.955 88	0.955 59	0.955 29
23	0.957 51	0.957 22	0.956 93	0.956 65	0.956 36	0.956 07	0.955 77	0.955 48	0.955 18	0.954 89
24	0.957 15	0.956 86	0.956 56	0.956 27	0.955 97	0.955 68	0.955 38	0.955 09	0.954 79	0.954 50
25	0.956 78	0.956 48	0.956 19	0.955 89	0.955 60	0.955 30	0.955 00	0.954 70	0.954 40	0.954 10
26	0.956 40	0.956 10	0.955 81	0.955 51	0.955 22	0.954 92	0.954 62	0.954 31	0.954 01	0.953 70
27	0.956 04	0.955 74	0.955 44	0.955 14	0.954 84	0.954 54	0.954 24	0.953 93	0.953 63	0.952 56
28	0.955 69	0.955 39	0.955 08	0.954 78	0.954 47	0.954 17	0.953 86	0.953 55	0.953 24	0.952 93
29	0.955 33	0.955 02	0.954 72	0.954 41	0.954 11	0.953 80	0.953 49	0.953 18	0.952 87	0.952 56
30	0.954 97	0.954 66	0.954 35	0.954 05	0.953 74	0.953 43	0.953 12	0.952 80	0.952 49	0.952 17
31	0.954 62	0.954 31	0.954 00	0.953 69	0.953 38	0.953 07	0.952 75	0.952 44	0.952 12	0.951 81
32	0.954 28	0.953 97	0.953 66	0.953 34	0.953 03	0.952 72	0.952 40	0.952 08	0.951 77	0.951 45
33	0.953 93	0.953 62	0.953 30	0.952 99	0.952 67	0.952 36	0.952 04	0.951 72	0.951 39	0.951 07
34	0.953 59	0.953 27	0.952 95	0.952 64	0.952 32	0.952 00	0.951 68	0.951 36	0.951 03	0.950 71
35	0.953 25	0.952 93	0.952 61	0.952 29	0.951 97	0.951 65	0.951 32	0.951 00	0.950 67	0.950 35
36	0.952 91	0.952 59	0.952 27	0.951 95	0.951 63	0.951 31	0.950 98	0.950 65	0.950 33	0.950 00
37	0.952 57	0.952 25	0.951 92	0.951 60	0.951 27	0.950 95	0.950 62	0.950 29	0.949 97	0.949 64
38	0.952 25	0.951 92	0.951 60	0.951 27	0.950 95	0.950 62	0.950 29	0.949 96	0.949 62	0.949 29
39	0.951 92	0.951 59	0.951 26	0.950 94	0.950 61	0.950 28	0.949 95	0.949 61	0.949 28	0.948 94
40	0.951 60	0.951 27	0.950 94	0.950 61	0.950 28	0.949 95	0.949 61	0.949 27	0.948 94	0.948 60

Temperature °C	Percentages of Volume at 20°C									
	36.0	36.2	36.4	36.6	36.8	37.0	37.2	37.4	37.6	37.8
10	0.960 32	0.960 06	0.959 79	0.959 53	0.959 26	0.959 00	0.958 72	0.958 45	0.958 17	0.957 90
11	0.959 84	0.959 57	0.959 30	0.959 04	0.958 77	0.958 50	0.958 22	0.957 95	0.957 67	0.957 40
12	0.959 37	0.959 10	0.958 83	0.958 55	0.958 28	0.958 01	0.957 73	0.957 45	0.957 17	0.956 89
13	0.958 90	0.958 63	0.958 35	0.958 08	0.957 80	0.957 53	0.957 25	0.956 97	0.956 68	0.956 40
14	0.958 45	0.958 17	0.957 89	0.957 61	0.957 33	0.957 05	0.956 77	0.956 48	0.956 20	0.955 91
15	0.957 99	0.957 71	0.957 43	0.957 15	0.956 87	0.956 59	0.956 30	0.956 01	0.955 72	0.955 43
16	0.957 55	0.957 27	0.956 98	0.956 70	0.956 41	0.956 13	0.955 84	0.955 55	0.955 25	0.954 96
17	0.957 11	0.956 82	0.956 54	0.956 25	0.955 97	0.955 68	0.955 39	0.955 09	0.954 80	0.954 50
18	0.956 67	0.956 38	0.956 09	0.955 81	0.955 52	0.955 23	0.954 93	0.954 64	0.954 34	0.954 05
19	0.956 25	0.955 96	0.955 67	0.955 37	0.955 08	0.954 79	0.954 49	0.954 19	0.953 90	0.953 60
20	0.955 82	0.955 53	0.955 24	0.954 94	0.954 65	0.954 36	0.954 06	0.953 76	0.953 45	0.953 15
21	0.955 41	0.955 11	0.954 81	0.954 52	0.954 22	0.953 92	0.953 61	0.953 31	0.953 00	0.952 70
22	0.955 00	0.954 70	0.954 40	0.954 10	0.953 80	0.953 50	0.953 19	0.952 88	0.952 58	0.952 27
23	0.954 59	0.954 29	0.953 99	0.953 68	0.953 38	0.953 08	0.952 77	0.952 46	0.952 14	0.951 83
24	0.954 20	0.953 89	0.953 59	0.953 28	0.952 98	0.952 67	0.952 36	0.952 05	0.951 73	0.951 42
25	0.953 80	0.953 49	0.953 18	0.952 88	0.952 57	0.952 26	0.951 94	0.951 63	0.951 31	0.951 00
26	0.953 40	0.953 09	0.952 78	0.952 46	0.952 15	0.951 84	0.951 52	0.951 21	0.950 89	0.950 58
27	0.953 02	0.952 71	0.952 39	0.952 08	0.951 76	0.951 45	0.951 13	0.950 81	0.950 48	0.950 16
28	0.952 62	0.952 30	0.951 99	0.951 67	0.951 36	0.951 04	0.950 72	0.950 40	0.950 08	0.949 76
29	0.952 25	0.951 93	0.951 61	0.951 30	0.950 98	0.950 66	0.950 33	0.950 01	0.949 68	0.949 36
30	0.951 86	0.951 54	0.951 22	0.950 90	0.950 58	0.950 26	0.949 93	0.949 60	0.949 28	0.948 95
31	0.951 49	0.951 17	0.950 84	0.950 52	0.950 19	0.949 87	0.949 54	0.949 21	0.948 88	0.948 55
32	0.951 13	0.950 80	0.950 48	0.950 15	0.949 83	0.949 50	0.949 17	0.948 84	0.948 50	0.948 17
33	0.950 75	0.950 42	0.950 10	0.949 77	0.949 45	0.949 12	0.948 79	0.948 45	0.948 12	0.947 78
34	0.950 39	0.950 06	0.949 73	0.949 40	0.949 07	0.948 74	0.948 40	0.948 07	0.947 73	0.947 40
35	0.950 02	0.949 69	0.949 36	0.949 03	0.948 70	0.948 37	0.948 03	0.947 69	0.947 36	0.947 02
36	0.949 67	0.949 34	0.949 00	0.948 67	0.948 33	0.948 00	0.947 66	0.947 32	0.946 97	0.946 63
37	0.949 31	0.948 97	0.948 64	0.948 30	0.947 97	0.947 63	0.947 29	0.946 94	0.946 60	0.946 25
38	0.948 96	0.948 62	0.948 28	0.947 94	0.947 60	0.947 26	0.946 92	0.943 58	0.946 23	0.945 89
39	0.948 61	0.948 27	0.947 93	0.947 58	0.947 24	0.946 90	0.946 56	0.946 21	0.945 87	0.945 52
40	0.948 26	0.947 92	0.947 58	0.947 23	0.946 89	0.946 55	0.946 20	0.945 85	0.945 51	0.945 16

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	38.0	38.2	38.4	38.6	38.8	39.0	39.2	39.4	39.6	39.8
10	0.957 62	0.957 34	0.957 06	0.956 77	0.956 49	0.956 21	0.955 92	0.955 63	0.955 34	0.955 05
11	0.957 12	0.956 84	0.956 55	0.956 27	0.955 98	0.955 70	0.955 40	0.955 11	0.954 81	0.954 52
12	0.956 61	0.956 32	0.956 04	0.955 75	0.955 47	0.955 18	0.954 88	0.954 58	0.954 29	0.953 99
13	0.956 12	0.955 83	0.955 54	0.955 24	0.954 95	0.954 66	0.954 36	0.954 06	0.953 77	0.953 47
14	0.955 63	0.955 34	0.955 04	0.954 75	0.954 45	0.954 16	0.953 86	0.953 55	0.953 25	0.952 94
15	0.955 14	0.954 84	0.954 55	0.954 25	0.953 96	0.953 66	0.953 36	0.953 05	0.952 75	0.952 44
16	0.954 67	0.954 37	0.954 07	0.953 78	0.953 48	0.953 18	0.952 87	0.952 56	0.952 26	0.951 95
17	0.954 21	0.953 91	0.953 61	0.953 30	0.953 00	0.952 70	0.952 39	0.952 08	0.951 77	0.951 46
18	0.953 75	0.953 44	0.953 14	0.952 83	0.952 53	0.952 22	0.951 91	0.951 60	0.951 28	0.950 97
19	0.953 30	0.952 99	0.952 68	0.952 37	0.952 06	0.951 75	0.951 44	0.951 12	0.950 81	0.950 49
20	0.952 85	0.952 54	0.952 23	0.951 91	0.951 60	0.951 29	0.950 97	0.950 66	0.950 34	0.950 03
21	0.952 39	0.952 08	0.951 77	0.951 45	0.951 14	0.950 83	0.950 51	0.950 19	0.949 88	0.949 56
22	0.951 96	0.951 64	0.951 33	0.951 01	0.950 70	0.950 38	0.950 06	0.949 73	0.949 41	0.949 08
23	0.951 52	0.951 20	0.950 88	0.950 57	0.950 25	0.949 93	0.949 61	0.949 28	0.948 96	0.948 63
24	0.951 11	0.950 79	0.950 47	0.950 14	0.949 82	0.949 50	0.949 17	0.948 84	0.948 52	0.948 19
25	0.950 68	0.950 36	0.950 04	0.949 71	0.949 39	0.949 07	0.948 74	0.948 41	0.948 08	0.947 75
26	0.950 26	0.949 93	0.949 61	0.949 28	0.948 96	0.948 63	0.948 30	0.947 97	0.947 63	0.947 30
27	0.949 84	0.949 51	0.949 19	0.948 86	0.948 54	0.948 21	0.947 88	0.947 54	0.947 21	0.946 87
28	0.949 44	0.949 11	0.948 78	0.948 45	0.948 12	0.947 79	0.947 45	0.947 11	0.946 78	0.946 44
29	0.949 03	0.948 70	0.948 37	0.948 03	0.947 70	0.947 37	0.947 03	0.946 69	0.946 35	0.946 01
30	0.948 62	0.948 29	0.947 95	0.947 62	0.947 28	0.946 95	0.946 61	0.946 27	0.945 92	0.945 58
31	0.948 22	0.947 89	0.947 55	0.947 22	0.946 88	0.946 55	0.946 21	0.945 86	0.945 52	0.945 17
32	0.947 84	0.947 50	0.947 16	0.946 83	0.946 49	0.946 15	0.945 80	0.945 46	0.945 11	0.944 77
33	0.947 45	0.947 11	0.946 77	0.946 42	0.946 08	0.945 74	0.945 39	0.945 04	0.944 70	0.944 35
34	0.947 06	0.946 72	0.946 38	0.946 03	0.945 69	0.945 35	0.945 00	0.944 65	0.944 29	0.943 94
35	0.946 68	0.946 33	0.945 99	0.945 64	0.945 30	0.944 95	0.944 60	0.944 25	0.943 89	0.943 54
36	0.946 29	0.945 94	0.945 60	0.945 25	0.944 91	0.944 56	0.944 21	0.943 86	0.943 50	0.943 15
37	0.945 91	0.945 56	0.945 21	0.944 87	0.944 52	0.944 17	0.943 82	0.943 46	0.943 11	0.942 75
38	0.945 55	0.945 20	0.944 85	0.944 50	0.944 15	0.943 80	0.943 44	0.943 08	0.942 73	0.942 37
39	0.945 18	0.944 83	0.944 47	0.944 12	0.943 76	0.943 41	0.943 05	0.942 70	0.942 34	0.941 99
40	0.944 81	0.944 46	0.944 10	0.943 75	0.943 39	0.943 04	0.942 68	0.942 32	0.941 96	0.941 60

Temperature °C	Percentages of Volume at 20°C									
	40.0	40.2	40.4	40.6	40.8	41.0	41.2	41.4	41.6	41.8
10	0.954 76	0.954 46	0.954 16	0.953 86	0.953 56	0.953 26	0.952 95	0.952 64	0.952 33	0.952 02
11	0.954 22	0.953 92	0.953 61	0.953 31	0.953 00	0.952 70	0.952 39	0.952 08	0.951 76	0.951 45
12	0.953 69	0.953 39	0.953 08	0.952 78	0.952 47	0.952 17	0.951 85	0.951 54	0.951 22	0.950 91
13	0.953 17	0.952 86	0.952 55	0.952 25	0.951 94	0.951 63	0.951 31	0.950 99	0.950 68	0.950 36
14	0.952 64	0.952 33	0.952 02	0.951 71	0.951 40	0.951 09	0.950 77	0.950 45	0.950 14	0.949 82
15	0.952 14	0.951 82	0.951 51	0.951 19	0.950 88	0.950 56	0.950 24	0.949 92	0.949 60	0.949 28
16	0.951 64	0.951 32	0.951 01	0.950 69	0.950 38	0.950 06	0.949 73	0.949 41	0.949 08	0.948 76
17	0.951 15	0.950 83	0.950 51	0.950 20	0.949 88	0.949 56	0.949 23	0.948 90	0.948 58	0.948 25
18	0.950 66	0.950 34	0.950 02	0.949 70	0.949 38	0.949 06	0.948 73	0.948 40	0.948 07	0.947 74
19	0.950 18	0.949 86	0.949 53	0.949 21	0.948 88	0.948 56	0.948 23	0.947 90	0.947 56	0.947 23
20	0.949 71	0.949 38	0.949 05	0.948 73	0.948 40	0.948 07	0.947 74	0.947 41	0.947 07	0.946 74
21	0.949 24	0.948 91	0.948 58	0.948 25	0.947 92	0.947 59	0.947 26	0.946 92	0.946 59	0.946 25
22	0.948 76	0.948 43	0.948 10	0.947 78	0.947 45	0.947 12	0.946 78	0.946 44	0.946 10	0.945 76
23	0.948 31	0.947 98	0.947 64	0.947 31	0.946 97	0.946 64	0.946 30	0.945 96	0.945 63	0.945 29
24	0.947 86	0.947 53	0.947 19	0.946 86	0.946 52	0.946 19	0.945 85	0.945 51	0.945 16	0.944 82
25	0.947 42	0.947 08	0.946 74	0.946 41	0.946 07	0.945 73	0.945 39	0.945 04	0.944 70	0.944 35
26	0.946 97	0.946 63	0.946 29	0.945 96	0.945 62	0.945 28	0.944 93	0.944 58	0.944 24	0.943 89
27	0.946 54	0.946 20	0.945 86	0.945 51	0.945 17	0.944 83	0.944 48	0.944 13	0.943 78	0.943 43
28	0.946 10	0.945 76	0.945 41	0.945 07	0.944 72	0.944 38	0.944 03	0.943 68	0.943 33	0.942 98
29	0.945 67	0.945 32	0.944 98	0.944 63	0.944 29	0.943 94	0.943 59	0.943 24	0.942 89	0.942 54
30	0.945 24	0.944 89	0.944 55	0.944 20	0.943 86	0.943 51	0.943 16	0.942 80	0.942 45	0.943 09
31	0.944 83	0.944 48	0.944 13	0.943 79	0.943 44	0.943 09	0.942 73	0.942 37	0.942 02	0.941 66
32	0.944 42	0.944 07	0.943 72	0.943 36	0.943 01	0.942 66	0.942 30	0.941 94	0.941 59	0.941 23
33	0.944 00	0.943 65	0.943 29	0.942 94	0.942 58	0.942 23	0.941 87	0.941 51	0.941 16	0.940 80
34	0.943 59	0.943 24	0.942 88	0.942 53	0.942 17	0.941 82	0.941 46	0.941 10	0.940 73	0.940 37
35	0.943 19	0.942 83	0.942 48	0.942 12	0.941 77	0.941 41	0.941 05	0.940 69	0.940 32	0.939 96
36	0.942 80	0.942 44	0.942 08	0.941 73	0.941 37	0.941 01	0.940 64	0.940 28	0.939 91	0.9239 55
37	0.942 40	0.942 04	0.941 68	0.941 31	0.940 95	0.940 59	0.940 22	0.939 86	0.939 49	0.939 13
38	0.942 01	0.941 65	0.941 29	0.940 92	0.940 56	0.940 20	0.939 83	0.939 46	0.939 10	0.938 73
39	0.941 63	0.941 26	0.940 90	0.940 53	0.940 17	0.939 80	0.939 43	0.939 06	0.938 70	0.938 33
40	0.941 24	0.940 88	0.940 51	0.940 15	0.939 78	0.939 42	0.939 05	0.938 68	0.938 30	0.937 93

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	42.0	42.2	42.4	42.6	42.8	43.0	43.2	43.4	43.6	43.8
10	0.951 71	0.951 39	0.951 07	0.950 75	0.950 43	0.950 11	0.949 78	0.949 46	0.949 13	0.948 81
11	0.951 14	0.950 82	0.950 50	0.950 18	0.949 86	0.949 54	0.949 21	0.948 88	0.948 55	0.948 22
12	0.950 59	0.950 27	0.949 94	0.949 62	0.949 29	0.948 97	0.948 64	0.948 31	0.947 97	0.947 64
13	0.950 04	0.949 71	0.949 39	0.949 06	0.948 74	0.948 41	0.948 08	0.947 74	0.947 41	0.947 07
14	0.949 50	0.949 17	0.948 84	0.948 52	0.948 19	0.947 86	0.947 52	0.947 18	0.946 85	0.946 51
15	0.948 96	0.948 63	0.948 30	0.947 97	0.947 64	0.947 31	0.946 97	0.946 63	0.946 29	0.945 95
16	0.948 43	0.948 10	0.947 77	0.947 44	0.947 11	0.946 78	0.946 44	0.946 10	0.945 75	0.945 41
17	0.947 92	0.947 59	0.947 25	0.946 92	0.946 58	0.946 25	0.945 91	0.945 56	0.945 22	0.944 87
18	0.947 41	0.947 07	0.946 74	0.946 40	0.946 07	0.945 73	0.945 38	0.945 04	0.944 69	0.944 35
19	0.946 90	0.946 56	0.946 22	0.945 89	0.945 55	0.945 21	0.944 86	0.944 51	0.944 17	0.943 82
20	0.946 41	0.946 07	0.945 73	0.945 38	0.945 04	0.944 70	0.944 35	0.944 00	0.943 66	0.943 31
21	0.945 92	0.945 58	0.945 23	0.944 89	0.944 54	0.944 20	0.943 85	0.943 50	0.943 14	0.942 79
22	0.945 42	0.945 08	0.944 73	0.944 39	0.944 04	0.943 70	0.943 35	0.942 99	0.942 64	0.942 28
23	0.944 95	0.944 60	0.944 25	0.943 90	0.943 55	0.943 20	0.942 85	0.942 50	0.942 14	0.941 79
24	0.944 48	0.944 13	0.943 78	0.943 43	0.943 08	0.942 73	0.942 37	0.942 02	0.941 66	0.941 31
25	0.944 01	0.943 66	0.943 31	0.942 95	0.942 60	0.942 25	0.941 89	0.941 53	0.941 18	0.940 82
26	0.943 54	0.943 19	0.942 83	0.942 48	0.942 12	0.941 77	0.941 41	0.941 05	0.940 69	0.940 33
27	0.943 08	0.942 72	0.942 37	0.942 01	0.941 66	0.941 30	0.940 94	0.940 58	0.940 22	0.939 86
28	0.942 63	0.942 27	0.941 92	0.941 56	0.941 21	0.940 85	0.940 49	0.940 12	0.939 76	0.939 39
29	0.942 19	0.941 83	0.941 47	0.941 11	0.940 75	0.940 39	0.940 02	0.939 66	0.939 29	0.938 93
30	0.941 74	0.941 38	0.941 02	0.940 65	0.940 29	0.939 93	0.939 56	0.939 20	0.938 83	0.938 47
31	0.941 30	0.940 94	0.940 58	0.940 21	0.939 85	0.939 49	0.939 12	0.938 75	0.938 38	0.938 01
32	0.940 87	0.940 51	0.940 14	0.939 78	0.939 41	0.939 05	0.938 68	0.938 31	0.937 93	0.937 56
33	0.940 44	0.940 07	0.939 71	0.939 34	0.938 98	0.938 61	0.938 24	0.937 87	0.937 49	0.937 12
34	0.940 01	0.939 64	0.939 28	0.938 91	0.938 55	0.938 18	0.937 81	0.937 43	0.937 06	0.936 68
35	0.939 60	0.939 23	0.938 86	0.938 48	0.938 11	0.937 74	0.937 37	0.936 99	0.936 62	0.936 24
36	0.939 18	0.938 81	0.938 44	0.938 06	0.937 69	0.937 32	0.936 94	0.936 56	0.936 19	0.935 81
37	0.938 76	0.938 39	0.938 01	0.937 64	0.937 26	0.936 89	0.936 51	0.936 13	0.935 76	0.935 38
38	0.938 36	0.937 99	0.937 61	0.937 24	0.936 86	0.936 49	0.936 11	0.935 73	0.935 35	0.934 97
39	0.937 96	0.937 58	0.937 21	0.936 83	0.936 46	0.936 08	0.935 70	0.935 31	0.934 93	0.934 54
40	0.937 56	0.937 18	0.936 80	0.936 43	0.936 05	0.935 67	0.935 29	0.934 91	0.934 52	0.934 14

(Continued)

Temperature °C	Percentages of Volume at 20°C									
	44.0	44.2	44.4	44.6	44.8	45.0	45.2	45.4	45.6	45.8
10	0.948 48	0.948 14	0.947 81	0.947 47	0.947 14	0.946 80	0.946 46	0.946 11	0.945 77	0.945 42
11	0.947 89	0.947 55	0.947 21	0.946 88	0.946 54	0.946 20	0.945 85	0.945 51	0.945 16	0.944 82
12	0.947 31	0.946 97	0.946 63	0.946 30	0.945 96	0.945 62	0.945 27	0.944 92	0.944 57	0.944 22
13	0.946 74	0.946 40	0.946 06	0.945 71	0.945 37	0.945 03	0.944 68	0.944 33	0.943 98	0.943 63
14	0.946 17	0.945 83	0.945 48	0.945 14	0.944 79	0.944 45	0.944 10	0.943 75	0.943 40	0.943 05
15	0.945 61	0.945 26	0.944 92	0.944 57	0.944 23	0.943 88	0.943 53	0.943 17	0.942 82	0.942 46
16	0.945 07	0.944 72	0.944 37	0.944 03	0.943 68	0.943 33	0.942 97	0.942 62	0.942 26	0.941 91
17	0.944 53	0.944 18	0.943 83	0.943 48	0.943 13	0.942 78	0.942 42	0.942 07	0.941 71	0.941 36
18	0.944 00	0.943 65	0.943 30	0.942 94	0.942 59	0.942 24	0.941 88	0.941 52	0.941 16	0.940 80
19	0.943 47	0.943 12	0.942 77	0.942 41	0.942 06	0.941 71	0.941 35	0.940 99	0.940 62	0.940 26
20	0.942 96	0.942 60	0.942 24	0.941 89	0.941 53	0.941 17	0.940 81	0.940 45	0.940 08	0.939 72
21	0.942 44	0.942 08	0.941 72	0.941 37	0.941 01	0.940 65	0.940 28	0.939 92	0.939 55	0.939 19
22	0.941 93	0.941 57	0.941 21	0.940 85	0.940 49	0.940 13	0.939 76	0.939 40	0.939 03	0.938 67
23	0.941 44	0.941 08	0.940 72	0.940 35	0.939 99	0.939 63	0.939 26	0.938 89	0.938 52	0.938 15
24	0.940 95	0.940 59	0.940 22	0.939 86	0.939 49	0.939 13	0.938 76	0.938 39	0.938 01	0.937 64
25	0.940 46	0.940 09	0.939 73	0.939 36	0.939 00	0.938 63	0.938 26	0.937 89	0.937 51	0.937 14
26	0.939 97	0.939 60	0.939 24	0.938 87	0.938 51	0.938 14	0.937 77	0.937 39	0.937 02	0.936 64
27	0.939 50	0.939 13	0.938 76	0.938 39	0.938 02	0.937 65	0.937 28	0.936 90	0.936 58	0.936 15
28	0.939 03	0.938 66	0.938 29	0.937 91	0.937 54	0.937 17	0.936 79	0.936 42	0.936 04	0.935 67
29	0.938 56	0.938 19	0.937 82	0.937 44	0.937 07	0.936 70	0.936 32	0.935 94	0.935 57	0.935 19
30	0.938 10	0.937 73	0.937 35	0.936 98	0.936 60	0.936 23	0.935 85	0.935 47	0.935 09	0.934 71
31	0.937 64	0.937 26	0.936 89	0.936 51	0.936 14	0.935 76	0.935 38	0.935 00	0.934 61	0.934 23
32	0.937 19	0.936 81	0.936 44	0.936 06	0.935 69	0.935 31	0.934 93	0.934 54	0.934 16	0.933 77
33	0.936 75	0.936 37	0.935 99	0.935 61	0.935 23	0.934 85	0.934 46	0.934 08	0.933 69	0.933 31
34	0.936 31	0.935 93	0.935 55	0.935 16	0.934 78	0.934 40	0.934 01	0.933 63	0.933 24	0.932 86
35	0.935 87	0.935 49	0.935 11	0.934 72	0.934 34	0.933 96	0.933 57	0.933 18	0.932 80	0.932 41
36	0.935 43	0.935 05	0.934 67	0.934 28	0.933 90	0.933 52	0.933 13	0.932 74	0.932 36	0.931 97
37	0.935 00	0.934 62	0.934 23	0.933 85	0.933 46	0.933 08	0.932 69	0.932 30	0.931 91	0.931 52
38	0.934 59	0.934 20	0.933 82	0.933 43	0.933 05	0.932 66	0.932 27	0.931 88	0.931 48	0.931 09
39	0.934 16	0.933 77	0.933 39	0.933 00	0.932 62	0.932 23	0.931 84	0.931 44	0.931 05	0.930 65
40	0.933 76	0.933 37	0.932 98	0.932 59	0.932 20	0.931 81	0.931 42	0.931 02	0.930 63	0.930 23

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	46.0	46.2	46.4	46.6	46.8	47.0	47.2	47.4	47.6	47.8
10	0.945 08	0.944 72	0.944 37	0.944 01	0.943 66	0.943 30	0.942 94	0.942 58	0.942 22	0.941 86
11	0.944 47	0.944 12	0.943 76	0.943 41	0.943 05	0.942 70	0.942 34	0.941 97	0.941 61	0.941 24
12	0.943 87	0.943 51	0.943 16	0.942 80	0.942 45	0.942 09	0.941 73	0.941 36	0941 00	0.940 63
13	0.943 28	0.942 92	0.942 56	0.942 20	0.941 84	0.941 48	0.941 12	0.940 75	0.940 39	0.940 02
14	0.942 70	0.942 34	0.941 98	0.941 61	0.941 25	0.940 89	0.940 52	0.940 15	0.939 79	0.939 42
15	0.942 11	0.941 75	0.941 39	0.941 02	0.940 66	0.940 30	0.939 93	0.939 56	0.939 20	0.938 83
16	0.941 55	0.941 19	0.940 82	0.940 46	0.940 09	0.939 73	0.939 36	0.938 99	0.938 62	0.938 25
17	0.941 00	0.940 63	0.940 26	0.939 90	0.939 53	0.939 16	0.938 79	0.938 42	0.938 05	0.937 68
18	0.940 44	0.940 07	0.939 71	0.939 34	0.938 98	0.938 61	0.938 24	0.937 86	0.937 49	0.937 11
19	0.939 90	0.939 53	0.939 16	0.938 80	0.938 43	0.938 06	0.937 68	0.937 30	0.936 93	0.936 55
20	0.939 36	0.938 99	0.938 62	0.938 24	0.937 87	0.937 50	0.937 12	0.936 75	0.936 37	0.936 00
21	0.938 82	0.938 45	0.938 08	0.937 71	0.937 34	0.936 97	0.936 59	0.936 21	0.935 83	0.935 45
22	0.938 30	0.937 93	0.937 55	0.937 18	0.936 80	0.936 43	0.936 05	0.935 67	0.935 29	0.934 91
23	0.937 78	0.937 41	0.937 03	0.936 66	0.936 28	0.935 91	0.935 53	0.935 15	0.934 76	0.934 38
24	0.937 27	0.936 89	0.936 52	0.936 14	0.935 77	0.935 39	0.935 01	0.934 62	0.934 24	0.933 85
25	0.936 77	0.936 39	0.936 01	0.935 64	0.935 26	0.934 88	0.934 49	0.934 11	0.933 72	0.933 34
26	0.936 27	0.935 89	0.935 51	0.935 13	0.934 75	0.934 37	0.933 98	0.933 59	0.933 21	0.932 82
27	0.935 78	0.935 40	0.935 02	0.934 63	0.934 25	0.933 87	0.933 48	0.933 09	0.932 70	0.932 31
28	0.935 29	0.934 91	0.934 52	0.934 14	0.933 75	0.933 37	0.932 98	0.932 59	0.932 20	0.931 81
29	0.934 81	0.934 42	0.934 04	0.933 65	0.933 27	0.932 88	0.932 49	0.932 10	0.931 71	0.931 32
30	0.934 33	0.933 94	0.933 55	0.933 17	0.932 78	0.932 39	0.932 00	0.931 60	0.931 21	0.930 81
31	0.933 85	0.933 46	0.933 07	0.932 69	0.932 30	0.931 91	0.931 52	0.931 13	0.930 73	0.930 34
32	0.933 39	0.933 00	0.932 61	0.932 23	0.931 84	0.931 45	0.931 05	0.930 66	0.930 26	0.929 87
33	0.932 92	0.932 53	0.932 14	0.931 75	0.931 36	0.930 97	0.930 57	0.930 18	0.929 78	0.929 39
34	0.932 47	0.932 08	0.931 69	0.931 29	0.930 90	0.930 51	0.930 11	0.929 71	0.929 32	0.928 92
35	0.932 02	0.931 63	0.931 23	0.930 84	0.930 44	0.930 05	0.929 65	0.929 25	0.928 86	0.928 46
36	0.931 58	0.931 18	0.930 79	0.930 39	0.930 00	0.929 60	0.929 20	0.928 80	0.928 40	0.928 00
37	0.931 13	0.930 73	0.930 33	0.929 94	0.929 54	0.929 14	0.928 74	0.928 34	0.927 94	0.927 54
38	0.930 70	0.930 30	0.929 90	0.929 50	0.929 10	0.928 70	0.928 30	0.927 90	0.927 50	0.927 10
39	0.930 26	0.929 86	0.929 46	0.929 06	0.928 66	0.928 26	0.927 86	0.927 46	0.927 05	0.926 65
40	0.929 84	0.929 44	0.929 04	0.928 63	0.928 23	0.927 83	0.927 42	0.927 02	0.926 61	0.926 21

Temperature °C	Percentages of Volume at 20°C									
	48.0	48.2	48.4	48.6	48.8	49.0	49.2	49.4	49.6	49.8
10	0.941 50	0.941 13	0.940 76	0.940 40	0.940 03	0.939 66	0.939 28	0.938 91	0.938 53	0.938 16
11	0.940 88	0.940 51	0.940 14	0.939 77	0.939 40	0.939 03	0.938 65	0.938 27	0.937 90	0.937 52
12	0.940 27	0.939 90	0.939 52	0.939 15	0.938 77	0.938 40	0.938 02	0.937 64	0.937 27	0.936 89
13	0.939 66	0.939 29	0.938 91	0.938 54	0.938 16	0.937 79	0.937 41	0.937 03	0.936 64	0.936 26
14	0.939 05	0.938 68	0.938 30	0.937 93	0.937 55	0.937 18	0.936 80	0.936 42	0.936 03	0.935 65
15	0.938 46	0.938 08	0.937 71	0.937 33	0.936 96	0.936 58	0.936 20	0.935 81	0.935 43	0.935 04
16	0.937 88	0.937 50	0.937 12	0.936 75	0.936 37	0.935 99	0.935 60	0.935 22	0.934 83	0.934 45
17	0.937 31	0.936 93	0.936 55	0.936 16	0.935 78	0.935 40	0.935 02	0.934 63	0.934 25	0.933 86
18	0.936 74	0.936 36	0.935 98	0.935 59	0.935 21	0.934 83	0.934 44	0.934 06	0.933 67	0.933 29
19	0.936 17	0.935 79	0.935 41	0.935 03	0.934 65	0.934 27	0.933 88	0.933 49	0.933 10	0.932 71
20	0.935 62	0.935 24	0.934 85	0.934 47	0.934 08	0.933 70	0.933 31	0.932 92	0.932 53	0.932 14
21	0.935 07	0.934 69	0.934 30	0.933 92	0.933 53	0.933 15	0.932 76	0.932 37	0.931 97	0.931 58
22	0.934 53	0.934 14	0.933 76	0.933 37	0.932 99	0.932 60	0.932 21	0.931 81	0.931 42	0.931 02
23	0.934 00	0.933 61	0.933 22	0.932 83	0.932 44	0.932 05	0.931 66	0.931 26	0.930 87	0.930 47
24	0.933 47	0.933 08	0.932 69	0.932 30	0.931 91	0.931 52	0.931 13	0.930 73	0.930 34	0.929 94
25	0.932 95	0.932 56	0.932 17	0.931 77	0.931 38	0.930 99	0.930 59	0.930 20	0.929 80	0.929 41
26	0.932 43	0.932 04	0.931 65	0.931 25	0.930 86	0.930 47	0.930 07	0.929 67	0.929 28	0.928 88
27	0.931 92	0.931 53	0.931 13	0.930 74	0.930 34	0.929 95	0.929 55	0.929 15	0.928 75	0.928 35
28	0.931 42	0.931 03	0.930 63	0.930 24	0.929 84	0.929 45	0.929 05	0.928 65	0.928 24	0.927 84
29	0.930 93	0.930 53	0.930 14	0.929 74	0.929 35	0.928 95	0.928 55	0.928 14	0.927 74	0.927 33
30	0.930 42	0.930 02	0.929 62	0.929 23	0.928 83	0.928 43	0.928 03	0.927 63	0.927 22	0.926 82
31	0.929 95	0.929 55	0.929 15	0.928 75	0.928 35	0.927 95	0.927 54	0.927 14	0.926 73	0.926 33
32	0.929 47	0.929 07	0.928 67	0.928 26	0.927 86	0.927 46	0.927 05	0.926 65	0.926 24	0.925 84
33	0.928 99	0.928 59	0.928 19	0.927 78	0.927 38	0.926 98	0.926 57	0.926 16	0.925 76	0.925 35
34	0.928 52	0.928 12	0.927 71	0.927 31	0.926 90	0.926 50	0.926 09	0.925 68	0.925 28	0.924 87
35	0.928 06	0.927 65	0.927 25	0.926 84	0.926 44	0.926 03	0.925 62	0.925 21	0.924 80	0.924 39
36	0.927 60	0.927 19	0.926 78	0.926 38	0.925 97	0.925 56	0.925 15	0.924 74	0.924 33	0.923 92
37	0.927 14	0.926 73	0.926 32	0.925 92	0.925 51	0.925 10	0.924 69	0.924 28	0.923 86	0.923 45
38	0.926 70	0.926 29	0.925 88	0.925 47	0.925 06	0.924 65	0.924 24	0.923 82	0.923 41	0.922 99
39	0.926 25	0.925 84	0.925 43	0.925 02	0.924 61	0.924 20	0.923 78	0.923 37	0.922 95	0.922 54
40	0.925 80	0.925 39	0.924 98	0.924 57	0.924 16	0.923 75	0.923 33	0.922 92	0.922 50	0.922 09

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	50.0	50.2	50.4	50.6	50.8	51.0	51.2	51.4	51.6	51.8
10	0.937 78	0.937 40	0.937 01	0.936 63	0.936 24	0.935 86	0.935 47	0.935 08	0.934 69	0.934 30
11	0.937 14	0.936 76	0.936 37	0.935 99	0.935 60	0.935 22	0.934 83	0.934 44	0.934 04	0.933 65
12	0.936 51	0.936 12	0.935 74	0.935 35	0.934 97	0.934 58	0.934 19	0.933 80	0.933 40	0.933 01
13	0.935 88	0.935 49	0.935 11	0.934 72	0.934 34	0.933 95	0.933 56	0.933 16	0.932 77	0.932 37
14	0.935 27	0.934 88	0.934 49	0.934 11	0.933 72	0.933 33	0.932 93	0.932 54	0.932 14	0.931 75
15	0.934 66	0.934 27	0.933 88	0.933 49	0.933 10	0.932 71	0.932 31	0.931 92	0.931 52	0.931 13
16	0.934 06	0.933 67	0.933 28	0.932 89	0.932 50	0.932 11	0.931 71	0.931 31	0.930 91	0.930 51
17	0.933 48	0.933 09	0.932 69	0.932 30	0.931 90	0.931 51	0.931 11	0.930 71	0.930 32	0.929 92
18	0.932 90	0.932 50	0.932 11	0.931 71	0.931 32	0.930 92	0.930 52	0.930 12	0.929 73	0.929 33
19	0.932 32	0.931 92	0.931 53	0.931 13	0.930 74	0.930 34	0.929 94	0.929 54	0.929 13	0.928 73
20	0.931 75	0.931 35	0.930 95	0.930 56	0.930 16	0.929 76	0.929 36	0.928 96	0.928 55	0.928 15
21	0.931 19	0.930 79	0.930 39	0.929 99	0.929 59	0.929 19	0.928 79	0.928 39	0.927 98	0.927 58
22	0.930 63	0.930 23	0.929 83	0.929 44	0.929 04	0.928 64	0.928 23	0.927 83	0.927 42	0.927 02
23	0.930 08	0.929 68	0.929 28	0.928 88	0.928 48	0.928 08	0.927 67	0.927 26	0.926 86	0.926 45
24	0.929 55	0.929 15	0.928 75	0.928 34	0.927 94	0.927 54	0.927 13	0.926 72	0.926 32	0.925 91
25	0.929 01	0.928 61	0.928 21	0.927 80	0.927 40	0.927 00	0.926 59	0.926 18	0.925 77	0.925 36
26	0.928 48	0.928 08	0.927 67	0.927 27	0.926 86	0.926 46	0.926 05	0.925 64	0.925 23	0.924 82
27	0.927 95	0.927 54	0.927 14	0.926 73	0.926 33	0.925 92	0.925 51	0.925 10	0.924 70	0.924 29
28	0.927 44	0.927 03	0.926 62	0.926 22	0.925 81	0.925 40	0.924 99	0.924 58	0.924 16	0.923 75
29	0.926 93	0.926 52	0.926 11	0.925 71	0.925 30	0.924 89	0.924 48	0.924 07	0.923 65	0.923 24
30	0.926 42	0.926 01	0.925 60	0.925 19	0.924 78	0.924 37	0.923 96	0.923 54	0.923 13	0.922 71
31	0.925 92	0.925 51	0.925 10	0.924 69	0.924 28	0.923 87	0.923 45	0.923 04	0.922 62	0.922 21
32	0.925 43	0.925 02	0.924 61	0.924 20	0.923 79	0.923 38	0.922 96	0.922 54	0.922 13	0.921 71
33	0.924 94	0.924 53	0.924 12	0.923 70	0.923 29	0.922 88	0.922 46	0.922 04	0.921 63	0.921 21
34	0.924 46	0.924 04	0.923 63	0.923 21	0.922 80	0.922 38	0.921 96	0.921 54	0.921 13	0.920 71
35	0.923 98	0.923 56	0.923 15	0.922 73	0.922 32	0.921 90	0.921 48	0.921 06	0.920 64	0.920 22
36	0.923 51	0.923 09	0.922 67	0.922 26	0.921 84	0.921 42	0.921 00	0.920 58	0.920 16	0.919 74
37	0.923 04	0.922 62	0.922 20	0.921 79	0.921 37	0.920 95	0.920 53	0.920 10	0.919 68	0.919 25
38	0.922 58	0.922 16	0.921 74	0.921 33	0.920 91	0.920 49	0.920 06	0.919 64	0.919 21	0.918 79
39	0.922 12	0.921 70	0.921 28	0.920 86	0.920 44	0.920 02	0.919 60	0.919 17	0.918 75	0.918 32
40	0.921 67	0.921 25	0.920 83	0.920 40	0.919 98	0.919 56	0.919 13	0.918 71	0.918 28	0.917 86

Temperature °C	Percentages of Volume at 20°C									
	52.0	52.2	52.4	52.6	52.8	53.0	53.2	53.4	53.6	53.8
10	0.933 91	0.933 51	0.933 12	0.932 72	0.932 33	0.931 93	0.931 53	0.931 12	0.930 72	0.930 31
11	0.933 26	0.932 86	0.932 46	0.932 07	0.931 67	0.931 27	0.930 87	0.930 46	0.930 06	0.929 65
12	0.932 62	0.932 22	0.931 82	0.931 42	0.931 02	0.930 62	0.930 21	0.929 81	0.929 40	0.929 00
13	0.931 98	0.931 58	0.931 18	0.930 78	0.930 38	0.929 98	0.929 57	0.929 17	0.928 76	0.928 36
14	0.931 35	0.930 95	0.930 55	0.930 14	0.929 74	0.929 34	0.928 93	0.928 52	0.928 12	0.927 71
15	0.930 73	0.930 33	0.929 92	0.929 52	0.929 11	0.928 71	0.928 30	0.927 89	0.927 49	0.927 08
16	0.930 11	0.929 71	0.929 31	0.928 90	0.928 50	0.928 10	0.927 69	0.927 28	0.926 86	0.926 45
17	0.929 52	0.929 12	0.928 71	0.928 31	0.927 90	0.927 50	0.927 09	0.926 68	0.926 26	0.925 85
18	0.928 93	0.928 52	0.928 11	0.927 71	0.927 30	0.926 89	0.926 48	0.926 07	0.925 66	0.925 25
19	0.928 33	0.927 92	0.927 52	0.927 11	0.926 71	0.926 30	0.925 89	0.925 47	0.925 06	0.924 64
20	0.927 75	0.927 34	0.926 93	0.926 53	0.926 12	0.925 71	0.925 30	0.924 88	0.924 47	0.924 05
21	0.927 18	0.926 77	0.926 36	0.925 95	0.925 54	0.925 13	0.924 72	0.924 30	0.923 89	0.923 47
22	0.926 61	0.926 20	0.925 79	0.925 37	0.924 96	0.924 55	0.924 14	0.923 72	0.923 31	0.922 89
23	0.926 04	0.925 63	0.925 22	0.924 80	0.924 39	0.923 98	0.923 56	0.923 15	0.922 73	0.922 32
24	0.925 50	0.925 09	0.924 67	0.924 26	0.923 84	0.923 43	0.923 01	0.922 60	0.922 18	0.921 77
25	0.924 95	0.924 54	0.924 12	0.923 71	0.923 29	0.922 88	0.922 46	0.922 04	0.921 62	0.921 20
26	0.924 41	0.923 99	0.923 58	0.923 16	0.922 75	0.922 33	0.921 91	0.921 49	0.921 07	0.920 65
27	0.923 88	0.923 46	0.923 04	0.922 63	0.922 21	0.921 79	0.921 37	0.920 95	0.920 53	0.920 11
28	0.923 34	0.922 92	0.922 50	0.922 09	0.921 67	0.921 25	0.920 83	0.920 41	0.919 98	0.919 56
29	0.922 83	0.922 41	0.921 99	0.921 57	0.921 15	0.920 73	0.920 30	0.919 88	0.919 45	0.919 03
30	0.922 30	0.921 88	0.921 46	0.921 04	0.920 62	0.920 20	0.919 77	0.919 35	0.918 92	0.918 50
31	0.921 79	0.921 37	0.920 95	0.920 52	0.920 10	0.919 68	0.919 25	0.918 83	0.918 40	0.917 98
32	0.921 29	0.920 87	0.920 44	0.920 02	0.919 59	0.919 17	0.918 74	0.918 32	0.917 89	0.917 47
33	0.920 79	0.920 36	0.919 94	0.919 51	0.919 09	0.918 66	0.918 23	0.917 81	0.917 38	0.916 96
34	0.920 29	0.919 86	0.919 44	0.919 01	0.918 59	0.918 16	0.917 73	0.917 30	0.916 88	0.916 45
35	0.919 80	0.919 37	0.918 95	0.918 52	0.918 10	0.917 67	0.917 24	0.916 81	0.916 38	0.915 95
36	0.919 32	0.918 89	0.918 46	0.918 04	0.917 61	0.917 18	0.916 75	0.916 32	0.915 88	0.915 45
37	0.918 83	0.918 40	0.917 97	0.917 55	0.917 12	0.916 69	0.916 26	0.915 83	0.915 39	0.914 96
38	0.918 36	0.917 93	0.917 50	0.917 07	0.916 64	0.916 21	0.915 78	0.915 35	0.914 91	0.914 48
39	0.917 90	0.917 47	0.917 04	0.916 60	0.916 17	0.915 74	0.915 31	0.914 87	0.914 44	0.914 00
40	0.917 43	0.917 00	0.916 57	0.916 13	0.915 70	0.915 27	0.914 83	0.914 40	0.913 96	0.913 53

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	54.0	54.2	54.4	54.6	54.8	55.0	55.2	55.4	55.6	55.8
10	0.929 91	0.929 50	0.929 09	0.928 68	0.928 27	0.927 86	0.927 45	0.927 03	0.926 62	0.926 20
11	0.929 25	0.928 84	0.928 43	0.928 02	0.927 61	0.927 20	0.926 78	0.926 36	0.925 95	0.925 53
12	0.928 59	0.928 18	0.927 77	0.927 36	0.926 95	0.926 54	0.926 12	0.925 70	0.925 29	0.924 87
13	0.927 95	0.927 54	0.927 13	0.926 71	0.926 30	0.935 89	0.925 47	0.925 05	0.924 63	0.924 21
14	0.927 30	0.926 89	0.926 48	0.926 06	0.925 65	0.925 24	0.924 82	0.924 40	0.923 98	0.923 56
15	0.926 67	0.926 25	0.925 84	0.925 42	0.925 01	0.924 59	0.924 17	0.923 75	0.923 34	0.922 92
16	0.926 04	0.925 63	0.925 21	0.924 80	0.924 38	0.923 97	0.923 55	0.923 13	0.922 71	0.922 29
17	0.925 44	0.925 02	0.924 61	0.924 19	0.923 78	0.923 36	0.922 94	0.922 51	0.922 09	0.921 66
18	0.924 84	0.924 42	0.924 00	0.923 58	0.923 16	0.922 74	0.922 32	0.921 90	0.921 47	0.921 05
19	0.924 23	0.923 81	0.923 39	0.922 97	0.922 55	0.922 13	0.921 71	0.921 29	0.920 86	0.920 44
20	0.923 64	0.923 22	0.922 80	0.922 38	0.921 96	0.921 54	0.921 11	0.920 69	0.920 26	0.919 84
21	0.923 06	0.922 64	0.922 22	0.921 79	0.921 37	0.920 95	0.920 52	0.920 10	0.919 67	0.919 25
22	0.922 48	0.922 06	0.921 63	0.921 21	0.920 78	0.920 36	0.919 93	0.919 51	0.919 08	0.918 66
23	0.921 90	0.921 48	0.921 06	0.920 63	0.920 21	0.919 79	0.919 36	0.918 93	0.918 50	0.918 07
24	0.921 35	0.920 93	0.920 50	0.920 08	0.919 65	0.919 23	0.918 80	0.918 37	0.917 94	0.917 51
25	0.920 78	0.920 35	0.919 93	0.919 50	0.919 08	0.918 65	0.918 22	0.917 79	0.917 37	0.916 94
26	0.920 23	0.919 80	0.919 38	0.918 95	0.918 53	0.918 10	0.917 67	0.917 24	0.916 80	0.916 37
27	0.919 69	0.919 26	0.918 83	0.918 41	0.917 98	0.917 55	0.917 12	0.916 69	0.916 25	0.915 82
28	0.919 14	0.918 71	0.918 28	0.917 86	0.917 43	0.917 00	0.916 57	0.916 14	0.915 70	0.915 27
29	0.918 60	0.918 17	0.917 74	0.917 32	0.916 89	0.916 46	0.916 03	0.915 59	0.915 16	0.914 72
30	0.918 07	0.917 64	0.917 21	0.916 79	0.916 36	0.915 93	0.915 49	0.915 06	0.914 62	0.914 19
31	0.917 55	0.917 12	0.916 69	0.916 26	0.915 83	0.915 40	0.914 96	0.914 53	0.914 09	0.913 66
32	0.917 04	0.916 61	0.916 18	0.915 74	0.915 31	0.914 88	0.914 44	0.914 00	0.913 57	0.913 13
33	0.916 53	0.916 10	0.915 66	0.915 23	0.914 79	0.914 36	0.913 92	0.913 48	0.913 05	0.912 61
34	0.916 02	0.915 59	0.915 15	0.914 72	0.914 28	0.913 85	0.913 41	0.912 97	0.912 53	0.912 09
35	0.915 52	0.915 08	0.914 65	0.914 21	0.913 78	0.913 34	0.912 90	0.912 46	0.912 02	0.911 58
36	0.915 02	0.914 58	0.914 15	0.913 71	0.913 28	0.912 84	0.912 40	0.911 96	0.911 51	0.911 07
37	0.914 53	0.914 09	0.913 65	0.913 22	0.912 78	0.912 34	0.911 90	0.911 46	0.911 01	0.910 57
38	0.914 05	0.913 61	0.913 17	0.912 74	0.912 30	0.911 86	0.911 42	0.910 97	0.910 53	0.910 08
39	0.913 57	0.913 13	0.912 69	0.912 25	0.911 81	0.911 37	0.910 92	0.910 48	0.910 03	0.909 59
40	0.913 09	0.912 65	0.912 21	0.911 76	0.911 32	0.910 88	0.910 43	0.909 99	0.909 54	0.909 10

Temperature °C	Percentages of Volume at 20°C									
	56.0	56.2	56.4	56.6	56.8	57.0	57.2	57.4	57.6	57.8
10	0.925 79	0.925 37	0.924 95	0.924 52	0.924 10	0.923 68	0.923 25	0.922 82	0.922 40	0.921 97
11	0.925 11	0.924 69	0.924 27	0.923 85	0.923 43	0.923 01	0.922 58	0.922 15	0.921 73	0.921 30
12	0.924 45	0.924 03	0.923 61	0.923 18	0.922 76	0.922 34	0.921 91	0.921 48	0.921 06	0.920 63
13	0.923 79	0.923 37	0.922 94	0.922 52	0.922 09	0.921 67	0.921 24	0.920 81	0.920 39	0.919 96
14	0.923 14	0.922 72	0.922 29	0.921 87	0.921 44	0.921 02	0.920 59	0.920 16	0.919 72	0.919 29
15	0.922 50	0.922 07	0.921 65	0.921 22	0.920 80	0.920 37	0.919 94	0.919 51	0.919 07	0.918 64
16	0.921 87	0.921 44	0.921 01	0.920 59	0.920 16	0.919 73	0.919 30	0.918 87	0.918 44	0.918 01
17	0.921 24	0.920 81	0.920 39	0.919 96	0.919 54	0.919 11	0.918 68	0.918 24	0.917 81	0.917 37
18	0.920 63	0.920 20	0.919 77	0.919 35	0.918 92	0.918 49	0.918 05	0.917 62	0.917 18	0.916 75
19	0.920 02	0.919 59	0.919 16	0.918 73	0.918 30	0.917 87	0.917 44	0.917 00	0.916 57	0.916 13
20	0.919 41	0.918 98	0.918 55	0.918 13	0.917 70	0.917 27	0.916 83	0.916 40	0.915 96	0.915 53
21	0.918 82	0.918 39	0.917 96	0.917 53	0.917 10	0.916 67	0.916 23	0.915 79	0.915 36	0.914 92
22	0.918 23	0.917 80	0.917 37	0.916 93	0.916 50	0.916 07	0.915 63	0.915 20	0.914 76	0.914 33
23	0.917 64	0.917 21	0.916 78	0.916 34	0.915 91	0.915 48	0.915 04	0.914 60	0.914 17	0.913 73
24	0.917 08	0.916 65	0.916 21	0.915 78	0.915 34	0.914 91	0.914 47	0.914 03	0.913 59	0.913 15
25	0.916 51	0.916 08	0.915 64	0.915 21	0.914 77	0.914 34	0.913 90	0.913 46	0.913 02	0.912 58
26	0.915 94	0.915 50	0.915 07	0.914 63	0.914 20	0.913 76	0.913 32	0.912 88	0.912 44	0.912 00
27	0.915 39	0.914 95	0.914 52	0.914 08	0.913 65	0.913 21	0.912 77	0.912 33	0.911 88	0.911 44
28	0.914 84	0.914 40	0.913 96	0.913 53	0.913 09	0.912 65	0.912 21	0.911 77	0.911 32	0.910 88
29	0.914 29	0.913 85	0.913 41	0.912 98	0.912 54	0.912 10	0.911 66	0.911 21	0.910 77	0.910 32
30	0.913 75	0.913 31	0.912 87	0.912 43	0.911 99	0.911 55	0.911 11	0.910 66	0.910 22	0.909 77
31	0.913 22	0.912 78	0.912 34	0.911 89	0.911 45	0.911 01	0.910 57	0.910 12	0.909 68	0.909 23
32	0.912 69	0.912 25	0.911 81	0.911 37	0.910 93	0.910 49	0.910 04	0.909 60	0.909 15	0.908 71
33	0.912 17	0.911 73	0.911 29	0.910 84	0.910 40	0.909 96	0.909 51	0.909 06	0.908 61	0.908 16
34	0.911 65	0.911 21	0.910 77	0.910 32	0.909 88	0.909 44	0.908 99	0.908 54	0.908 09	0.907 64
35	0.911 14	0.910 69	0.910 25	0.909 80	0.909 36	0.908 91	0.908 46	0.908 01	0.907 57	0.907 12
36	0.910 63	0.910 19	0.909 74	0.909 30	0.908 85	0.908 41	0.907 96	0.907 51	0.907 06	0.906 61
37	0.910 13	0.909 68	0.909 23	0.908 79	0.908 34	0.907 89	0.907 44	0.906 99	0.906 53	0.906 08
38	0.909 64	0.909 19	0.908 74	0.908 30	0.907 85	0.907 40	0.906 95	0.906 49	0.906 04	0.905 58
39	0.909 14	0.908 69	0.908 24	0.907 80	0.907 35	0.906 90	0.906 45	0.905 99	0.905 54	0.905 08
40	0.908 65	0.908 20	0.907 75	0.907 30	0.906 85	0.906 40	0.905 95	0.905 49	0.905 04	0.904 58

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	58.0	58.2	58.4	58.6	58.8	59.0	59.2	59.4	59.6	59.8
10	0.921 54	0.921 10	0.920 67	0.920 23	0.919 80	0.919 36	0.918 92	0.918 49	0.918 05	0.917 62
11	0.920 87	0.920 43	0.919 99	0.919 56	0.919 12	0.918 68	0.918 24	0.917 80	0.917 37	0.916 93
12	0.920 20	0.919 76	0.919 32	0.918 88	0.918 44	0.918 00	0.917 56	0.917 12	0.916 69	0.916 25
13	0.919 53	0.919 09	0.918 65	0.918 21	0.917 77	0.917 33	0.916 89	0.916 45	0.916 02	0.915 58
14	0.918 86	0.918 42	0.917 98	0.917 55	0.917 11	0.916 67	0.916 23	0.915 79	0.915 35	0.914 91
15	0.918 21	0.917 77	0.917 33	0.916 90	0.916 46	0.916 02	0.915 58	0.915 13	0.914 69	0.914 24
16	0.917 58	0.917 14	0.916 70	0.916 25	0.915 81	0.915 37	0.914 93	0.914 49	0.914 04	0.913 60
17	0.916 94	0.916 50	0.916 06	0.915 62	0.915 18	0.914 74	0.914 30	0.913 85	0.913 41	0.912 96
18	0.916 31	0.915 87	0.915 43	0.914 99	0.914 55	0.914 11	0.913 66	0.913 22	0.912 77	0.912 33
19	0.915 70	0.915 26	0.914 81	0.914 37	0.913 92	0.913 48	0.913 04	0.912 60	0.912 15	0.911 71
20	0.915 09	0.914 64	0.914 20	0.913 75	0.913 31	0.912 86	0.912 42	0.911 97	0.911 53	0.911 08
21	0.914 48	0.914 03	0.913 59	0.913 14	0.912 70	0.912 25	0.911 81	0.911 36	0.910 92	0.910 47
22	0.913 89	0.913 44	0.912 99	0.912 55	0.912 10	0.911 65	0.911 20	0.910 76	0.910 31	0.909 87
23	0.913 29	0.912 84	0.912 40	0.911 95	0.911 51	0.911 06	0.910 61	0.910 16	0.909 72	0.909 27
24	0.912 71	0.912 26	0.911 81	0.911 37	0.910 92	0.910 47	0.910 02	0.909 58	0.909 13	0.908 69
25	0.912 14	0.911 69	0.911 24	0.910 79	0.910 34	0.909 89	0.909 44	0.908 99	0.908 55	0.908 10
26	0.911 56	0.911 11	0.910 66	0.910 21	0.909 76	0.909 31	0.908 86	0.908 41	0.907 96	0.907 51
27	0.911 00	0.910 55	0.910 10	0.909 65	0.909 20	0.908 75	0.908 30	0.907 85	0.907 39	0.906 94
28	0.910 44	0.909 99	0.909 54	0.909 08	0.908 63	0.908 18	0.907 73	0.907 28	0.906 82	0.906 37
29	0.909 88	0.909 43	0.908 98	0.908 52	0.908 07	0.907 62	0.907 17	0.906 72	0.906 26	0.905 81
30	0.909 33	0.908 88	0.908 42	0.907 97	0.907 51	0.907 06	0.906 61	0.906 16	0.905 70	0.905 25
31	0.908 79	0.908 34	0.907 88	0.907 43	0.906 97	0.906 52	0.906 06	0.905 61	0.905 15	0.904 70
32	0.908 26	0.907 80	0.907 35	0.906 89	0.906 44	0.905 98	0.905 52	0.905 07	0.904 61	0.904 16
33	0.907 71	0.907 26	0.906 80	0.906 35	0.905 89	0.905 44	0.904 98	0.904 53	0.904 07	0.903 62
34	0.907 19	0.906 73	0.906 28	0.905 82	0.905 37	0.904 91	0.904 45	0.903 99	0.903 54	0.903 08
35	0.906 67	0.906 21	0.905 75	0.905 30	0.904 84	0.904 38	0.903 92	0.903 46	0.903 01	0.902 55
36	0.906 16	0.905 70	0.905 24	0.904 78	0.904 32	0.903 86	0.903 40	0.902 94	0.902 49	0.902 03
37	0.905 63	0.905 17	0.904 71	0.904 25	0.903 79	0.903 33	0.902 87	0.902 41	0.901 96	0.901 50
38	0.905 13	0.904 67	0.904 21	0.903 75	0.903 29	0.902 83	0.902 37	0.901 91	0.901 45	0.900 99
39	0.904 63	0.904 17	0.903 71	0.903 24	0.902 78	0.902 32	0.901 86	0.901 40	0.900 93	0.900 47
40	0.904 13	0.903 67	0.903 20	0.902 74	0.902 27	0.901 81	0.901 35	0.900 89	0.900 42	0.899 96

Temperature °C	Percentages of Volume at 20°C									
	60.0	60.2	60.4	60.6	60.8	61.0	61.2	61.4	61.6	61.8
10	0.917 18	0.916 74	0.916 30	0.915 85	0.915 41	0.914 97	0.914 52	0.914 07	0.913 63	0.913 18
11	0.916 49	0.916 05	0.915 61	0.915 16	0.914 72	0.914 28	0.913 83	0.913 38	0.912 93	0.912 48
12	0.915 81	0.915 37	0.914 92	0.914 48	0.914 03	0.913 59	0.913 14	0.912 69	0.912 24	0.911 79
13	0.915 14	0.914 69	0.914 25	0.913 80	0.913 36	0.912 91	0.912 46	0.912 01	0.911 56	0.911 11
14	0.914 47	0.914 02	0.913 58	0.913 13	0.912 69	0.912 24	0.911 79	0.911 34	0.910 89	0.910 44
15	0.913 80	0.913 36	0.912 91	0.912 47	0.912 02	0.911 58	0.911 13	0.910 67	0.910 22	0.909 76
16	0.913 16	0.912 71	0.912 26	0.911 82	0.911 37	0.910 92	0.910 47	0.910 02	0.909 57	0.909 12
17	0.912 52	0.912 07	0.911 63	0.911 18	0.910 74	0.910 29	0.909 84	0.909 38	0.908 93	0.908 47
18	0.911 88	0.911 43	0.910 99	0.910 54	0.910 10	0.909 65	0.909 19	0.908 74	0.908 28	0.907 83
19	0.911 27	0.910 82	0.910 37	0.909 91	0.909 46	0.909 01	0.908 56	0.908 10	0.907 65	0.907 19
20	0.910 64	0.910 19	0.909 74	0.909 29	0.908 84	0.908 39	0.907 93	0.907 48	0.907 02	0.906 57
21	0.910 03	0.909 58	0.909 13	0.908 67	0.908 22	0.907 77	0.907 31	0.906 86	0.906 40	0.905 95
22	0.909 42	0.908 97	0.908 52	0.908 07	0.907 62	0.907 17	0.906 71	0.906 25	0.905 80	0.905 34
23	0.908 82	0.908 37	0.907 91	0.907 46	0.907 00	0.906 55	0.906 09	0.905 64	0.905 18	0.904 73
24	0.908 24	0.907 79	0.907 33	0.906 88	0.906 42	0.905 97	0.905 51	0.905 05	0.904 60	0.904 14
25	0.907 65	0.907 19	0.906 74	0.906 28	0.905 83	0.905 37	0.904 91	0.904 45	0.904 00	0.903 54
26	0.907 06	0.906 61	0.906 15	0.905 70	0.905 24	0.904 79	0.904 33	0.903 87	0.903 41	0.902 95
27	0.906 49	0.906 03	0.905 58	0.905 12	0.904 67	0.904 21	0.903 75	0.903 29	0.902 83	0.902 37
28	0.905 92	0.905 46	0.905 01	0.904 55	0.904 10	0.903 64	0.903 18	0.902 72	0.902 26	0.901 80
29	0.905 36	0.904 90	0.904 45	0.903 99	0.903 54	0.903 08	0.902 62	0.902 15	0.901 69	0.901 22
30	0.904 80	0.904 34	0.903 88	0.903 42	0.902 96	0.902 50	0.902 04	0.901 58	0.901 11	0.900 65
31	0.904 24	0.903 78	0.903 32	0.902 87	0.902 41	0.901 95	0.901 49	0.901 02	0.900 56	0.900 09
32	0.903 70	0.903 24	0.902 78	0.902 33	0.901 87	0.901 41	0.900 94	0.900 48	0.900 01	0.899 55
33	0.903 16	0.902 70	0.902 24	0.901 77	0.901 31	0.900 85	0.900 39	0.899 92	0.899 46	0.898 99
34	0.902 62	0.902 16	0.901 70	0.901 24	0.900 78	0.900 32	0.899 85	0.899 38	0.898 92	0.898 45
35	0.902 09	0.901 63	0.901 17	0.900 70	0.900 24	0.899 78	0.899 31	0.898 84	0.898 38	0.897 91
36	0.901 57	0.901 11	0.900 64	0.900 18	0.899 71	0.899 25	0.898 78	0.898 31	0.897 84	0.897 37
37	0.901 04	0.900 57	0.900 11	0.899 64	0.899 18	0.898 71	0.898 24	0.897 77	0.897 31	0.896 84
38	0.900 53	0.900 06	0.899 60	0.899 13	0.898 67	0.898 20	0.897 73	0.897 26	0.896 79	0.896 32
39	0.900 01	0.899 54	0.899 08	0.898 61	0.898 15	0.897 68	0.897 21	0.896 74	0.896 27	0.895 80
40	0.899 50	0.899 03	0.898 56	0.898 10	0.897 63	0.897 16	0.896 69	0.896 22	0.895 74	0.895 27

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	62.0	62.2	62.4	62.6	62.8	63.0	63.2	63.4	63.6	63.8
10	0.912 73	0.912 28	0.911 83	0.911 37	0.910 92	0.910 47	0.910 01	0.909 55	0.909 10	0.908 64
11	0.912 03	0.911 58	0.911 13	0.910 67	0.910 22	0.909 77	0.909 31	0.908 85	0.908 40	0.907 94
12	0.911 34	0.910 89	0.910 44	0.909 98	0.909 53	0.909 08	0.908 62	0.908 16	0.907 70	0.907 24
13	0.910 66	0.910 21	0.909 75	0.909 30	0.908 84	0.908 39	0.907 93	0.907 47	0.907 01	0.906 55
14	0.909 99	0.909 53	0.909 08	0.908 62	0.908 17	0.907 71	0.907 25	0.906 79	0.906 33	0.905 87
15	0.909 31	0.908 86	0.908 40	0.907 95	0.907 49	0.907 04	0.906 58	0.906 12	0.905 66	0.905 20
16	0.908 67	0.908 21	0.907 75	0.907 30	0.906 84	0.906 38	0.905 92	0.905 46	0.904 99	0.904 53
17	0.908 02	0.907 56	0.907 10	0.906 65	0.906 19	0.905 73	0.905 27	0.904 81	0.904 34	0.903 88
18	0.907 37	0.906 91	0.906 46	0.906 00	0.905 55	0.905 09	0.904 63	0.904 16	0.903 70	0.903 23
19	0.906 74	0.906 28	0.905 82	0.905 37	0.904 91	0.904 45	0.903 99	0.903 52	0.903 06	0.902 59
20	0.906 11	0.905 65	0.905 19	0.904 74	0.904 28	0.903 82	0.903 35	0.902 89	0.902 42	0.901 96
21	0.905 49	0.905 03	0.904 57	0.904 11	0.903 65	0.903 19	0.902 73	0.902 26	0.901 80	0.901 33
22	0.904 88	0.904 42	0.903 96	0.903 49	0.903 03	0.902 57	0.902 10	0.901 64	0.901 17	0.900 71
23	0.904 27	0.903 81	0.903 35	0.902 88	0.902 42	0.901 96	0.901 49	0.901 03	0.900 56	0.900 10
24	0.903 68	0.903 22	0.902 75	0.902 29	0.901 82	0.901 36	0.900 89	0.900 42	0.899 96	0.899 49
25	0.903 08	0.902 62	0.902 15	0.901 69	0.901 22	0.900 76	0.900 29	0.899 82	0.899 36	0.898 89
26	0.902 49	0.902 03	0.901 56	0.901 10	0.900 63	0.900 17	0.899 70	0.899 23	0.898 76	0.898 29
27	0.901 91	0.901 45	0.900 98	0.900 52	0.900 05	0.899 59	0.899 12	0.898 65	0.898 17	0.897 70
28	0.901 34	0.900 87	0.900 40	0.899 94	0.899 47	0.899 00	0.898 53	0.898 06	0.897 59	0.897 12
29	0.900 76	0.900 29	0.899 83	0.899 36	0.898 90	0.898 43	0.897 96	0.897 49	0.897 01	0.896 54
30	0.900 19	0.899 72	0.899 25	0.898 79	0.898 32	0.897 85	0.897 38	0.896 91	0.896 43	0.895 96
31	0.899 63	0.899 16	0.898 69	0.898 23	0.897 76	0.897 29	0.896 82	0.896 34	0.895 87	0.895 39
32	0.899 08	0.898 61	0.898 14	0.897 68	0.897 21	0.896 74	0.896 26	0.895 79	0.895 31	0.894 84
33	0.898 53	0.898 06	0.897 59	0.897 12	0.896 65	0.896 18	0.895 71	0.895 23	0.894 76	0.894 28
34	0.897 98	0.897 51	0.897 04	0.896 56	0.896 09	0.895 62	0.895 15	0.894 67	0.894 20	0.893 72
35	0.897 44	0.896 97	0.896 50	0.896 02	0.895 55	0.895 08	0.894 60	0.894 13	0.893 65	0.893 18
36	0.896 90	0.896 43	0.895 96	0.895 48	0.895 01	0.894 54	0.894 06	0.893 59	0.893 11	0.892 64
37	0.896 37	0.895 90	0.895 42	0.894 95	0.894 47	0.894 00	0.893 52	0.893 04	0.892 57	0.892 09
38	0.895 85	0.895 37	0.894 90	0.894 42	0.893 95	0.893 47	0.892 99	0.892 51	0.892 04	0.891 56
39	0.895 33	0.894 85	0.894 38	0.893 90	0.893 43	0.892 95	0.892 47	0.891 99	0.891 51	0.891 03
40	0.894 80	0.894 32	0.893 85	0.893 37	0.892 90	0.892 42	0.891 94	0.891 46	0.890 98	0.890 50

Temperature °C	Percentages of Volume at 20°C									
	64.0	64.2	64.4	64.6	64.8	65.0	65.2	65.4	65.6	65.8
10	0.908 18	0.907 72	0.907 25	0.906 79	0.906 32	0.905 86	0.905 39	0.904 92	0.904 46	0.903 99
11	0.907 48	0.907 01	0.906 55	0.906 08	0.905 62	0.905 15	0.904 68	0.904 21	0.903 75	0.903 28
12	0.906 78	0.906 32	0.905 85	0.905 39	0.904 92	0.904 46	0.903 99	0.903 52	0.903 05	0.902 58
13	0.906 09	0.905 63	0.905 16	0.904 70	0.904 23	0.903 77	0.903 30	0.902 83	0.902 36	0.901 89
14	0.905 41	0.904 94	0.904 48	0.904 01	0.903 55	0.903 08	0.902 61	0.902 14	0.901 66	0.901 19
15	0.904 74	0.904 27	0.903 80	0.903 34	0.902 87	0.902 40	0.901 93	0.901 46	0.900 99	0.900 52
16	0.904 07	0.903 60	0.903 13	0.902 67	0.902 20	0.901 73	0.901 26	0.900 79	0.900 32	0.899 85
17	0.903 42	0.902 95	0.902 48	0.902 02	0.901 55	0.901 08	0.900 61	0.900 14	0.899 66	0.899 19
18	0.902 77	0.902 30	0.901 83	0.901 37	0.900 90	0.900 43	0.899 96	0.899 48	0.899 01	0.898 53
19	0.902 13	0.901 66	0.901 19	0.900 73	0.900 26	0.899 79	0.899 31	0.898 84	0.898 36	0.897 89
20	0.901 49	0.901 02	0.900 55	0.900 08	0.899 61	0.899 14	0.898 67	0.898 19	0.897 72	0.897 24
21	0.900 87	0.900 40	0.899 93	0.899 45	0.898 98	0.898 51	0.898 03	0.897 56	0.897 08	0.896 61
22	0.900 24	0.899 77	0.899 30	0.898 83	0.898 36	0.897 89	0.897 41	0.896 94	0.896 46	0.895 99
23	0.899 63	0.899 16	0.898 69	0.898 21	0.897 74	0.897 27	0.896 79	0.896 31	0.895 84	0.895 36
24	0.899 02	0.898 55	0.898 08	0.897 60	0.897 13	0.896 66	0.896 18	0.895 70	0.895 23	0.894 75
25	0.898 42	0.897 95	0.897 47	0.897 00	0.896 52	0.896 05	0.895 57	0.895 09	0.894 62	0.894 14
26	0.897 82	0.897 35	0896 87	0.896 40	0.895 92	0.895 45	0.894 97	0.894 49	0.894 02	0.893 54
27	0.897 23	0.896 76	0.896 28	0.895 81	0.895 33	0.894 86	0.894 38	0.893 90	0.893 42	0.892 94
28	0.896 65	0.896 17	0.895 70	0.895 22	0.894 75	0.894 27	0.893 79	0.893 31	0.892 83	0.892 35
29	0.896 07	0.895 59	0.895 12	0.894 64	0.894 17	0.893 69	0.893 21	0.892 73	0.892 25	0.891 77
30	0.895 49	0.895 01	0.894 53	0.894 06	0.893 58	0.893 10	0.892 62	0.892 14	0.891 66	0.891 18
31	0.894 92	0.894 44	0.893 97	0.893 49	0.893 02	0.892 54	0.892 06	0.891 57	0.891 09	0.890 60
32	0.894 36	0.893 88	0.893 41	0.892 93	0.892 46	0.891 98	0.891 50	0.891 01	0.890 53	0.890 04
33	0.893 81	0.893 33	0.892 85	0.892 37	0.891 89	0.891 41	0.890 93	0.890 44	0.889 96	0.889 47
34	0.893 25	0.892 77	0.892 29	0.891 81	0.891 33	0.890 85	0.890 37	0.889 88	0.889 40	0.888 91
35	0.892 70	0.892 22	0.891 74	0.891 26	0.890 78	0.890 30	0.889 81	0.889 33	0.888 84	0.888 36
36	0.892 16	0.891 68	0.891 20	0.890 71	0.890 23	0.889 75	0.889 26	0.888 78	0.888 29	0.887 81
37	0.891 61	0.891 13	0.890 65	0.890 16	0.889 68	0.889 20	0.888 71	0.888 23	0.887 74	0.887 26
38	0.891 08	0.890 60	0.890 11	0.889 63	0.889 14	0.888 66	0.888 17	0.887 68	0.887 20	0.886 71
39	0.890 55	0.890 06	0.889 58	0.889 09	0.888 61	0.888 12	0.887 63	0.887 14	0.886 66	0.886 17
40	0.890 02	0.889 53	0.889 05	0.888 56	0.888 08	0.887 59	0.887 10	0.886 61	0.886 13	0.885 64

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	66.0	66.2	66.4	66.6	66.8	67.0	67.2	67.4	67.6	67.8
10	0.903 52	0.903 05	0.902 58	0.902 10	0.901 63	0.901 16	0.900 68	0.900 20	0.899 72	0.899 24
11	0.902 81	0.902 34	0.901 87	0.901 39	0.900 92	0.900 45	0.899 97	0.899 49	0.899 01	0.898 53
12	0.902 11	0.901 63	0.901 16	0.900 68	0.900 21	0.899 73	0.899 25	0.898 77	0.898 30	0.897 82
13	0.901 42	0.900 94	0.900 47	0.899 99	0.899 52	0.899 04	0.898 56	0.898 08	0.897 60	0.897 12
14	0.900 72	0.900 25	0.899 77	0.899 30	0.898 82	0.898 35	0.897 87	0.897 39	0.896 90	0.896 42
15	0.900 05	0.899 57	0.899 09	0.898 62	0.898 14	0.897 66	0.897 18	0.896 70	0.896 22	0.895 74
16	0.899 38	0.898 90	0.898 42	0.897 95	0.897 47	0.896 99	0.896 51	0.896 03	0.895 54	0.895 06
17	0.898 72	0.898 24	0.897 76	0.897 28	0.896 80	0.896 32	0.895 84	0.895 36	0.894 87	0.894 39
18	0.898 06	0.897 58	0.897 10	0.896 62	0.896 14	0.895 66	0.895 18	0.894 70	0.894 21	0.893 73
19	0.897 41	0.896 93	0.896 45	0.895 98	0.895 50	0.895 02	0.894 54	0.894 05	0.893 57	0.893 08
20	0.896 77	0.896 29	0.895 81	0.895 33	0.894 85	0.894 37	0.893 89	0.893 40	0.892 92	0.892 43
21	0.896 13	0.895 65	0.895 17	0.894 70	0.894 22	0.893 74	0.893 25	0.892 77	0.892 28	0.891 80
22	0.895 51	0.895 03	0.894 55	0.894 06	0.893 58	0.893 10	0.892 61	0.892 13	0.891 64	0.891 16
23	0.894 88	0.894 40	0.893 92	0.893 43	0.892 95	0.892 47	0.891 99	0.891 50	0.891 02	0.890 53
24	0.894 27	0.893 79	0.893 31	0.892 82	0.892 34	0.891 86	0.891 37	0.890 89	0.890 40	0.889 92
25	0.893 66	0.893 18	0.892 70	0.892 22	0.891 74	0.891 26	0.890 77	0.890 28	0.889 79	0.889 30
26	0.893 06	0.892 58	0.892 09	0.891 61	0.891 12	0.890 64	0.890 15	0.889 66	0.889 17	0.888 68
27	0.892 46	0.891 98	0.891 49	0.891 01	0.890 52	0.890 04	0.889 55	0.889 06	0.888 57	0.888 08
28	0.891 87	0.891 39	0.890 90	0.890 42	0.889 93	0.889 45	0.888 96	0.888 47	0.887 98	0.887 49
29	0.891 29	0.890 80	0.890 31	0.889 83	0.889 34	0.888 85	0.888 36	0.887 87	0.887 38	0.886 89
30	0.890 70	0.890 21	0.889 73	0.889 24	0.888 76	0.888 27	0.887 78	0.887 28	0.886 79	0.886 29
31	0.890 12	0.889 63	0.889 15	0.888 66	0.888 18	0.887 69	0.887 20	0.886 71	0.886 21	0.885 72
32	0.889 56	0.889 07	0.888 58	0.888 10	0.887 61	0.887 12	0.886 63	0.886 14	0.885 64	0.885 15
33	0.888 99	0.888 50	0.888 01	0.887 53	0.887 04	0.886 55	0.886 06	0.885 56	0.885 07	0.884 57
34	0.888 43	0.887 94	0.887 45	0.886 96	0.886 47	0.885 98	0.885 49	0.884 99	0.884 50	0.884 00
35	0.887 87	0.887 38	0.886 89	0.886 40	0.885 91	0.885 42	0.884 92	0.884 43	0.883 93	0.883 44
36	0.887 32	0.886 83	0.886 34	0.885 84	0.885 35	0.884 86	0.884 36	0.883 87	0.883 37	0.882 88
37	0.886 77	0.886 28	0.885 79	0.885 29	0.884 80	0.884 31	0.883 81	0.883 31	0.882 82	0.882 32
38	0.886 22	0.885 73	0.885 24	0.884 74	0.884 25	0.883 76	0.883 26	0.882 77	0.882 27	0.881 78
39	0.885 68	0.885 19	0.884 69	0.884 20	0.883 70	0.883 21	0.882 71	0.882 21	0.881 72	0.881 22
40	0.885 15	0.884 65	0.884 16	0.883 66	0.883 17	0.882 67	0.882 17	0.881 67	0.881 18	0.880 68

Temperature °C	Percentages of Volume at 20°C									
	68.0	68.2	68.4	68.6	68.8	69.0	69.2	69.4	69.6	69.8
10	0.898 76	0.898 28	0.897 79	0.897 31	0.896 82	0.896 34	0.895 85	0.895 36	0.894 88	0.894 39
11	0.898 05	0.897 57	0.897 08	0.896 60	0.896 11	0.895 63	0.895 14	0.894 65	0.894 16	0.893 67
12	0.897 34	0.896 86	0.896 37	0.895 89	0.895 40	0.894 92	0.894 43	0.893 94	0.893 44	0.892 95
13	0.896 64	0.896 15	0.895 67	0.895 18	0.894 70	0.894 21	0.893 72	0.893 23	0.892 74	0.892 25
14	0.895 94	0.895 45	0.894 97	0.894 48	0.894 00	0.893 51	0.893 02	0.892 53	0.892 03	0.891 54
15	0.895 26	0.894 77	0.894 28	0.893 80	0.893 31	0.892 82	0.892 33	0.891 84	0.891 34	0.890 85
16	0.894 58	0.894 09	0.893 60	0.893 12	0.892 63	0.892 14	0.891 65	0.891 16	0.890 66	0.890 17
17	0.893 91	0.893 42	0.892 93	0.892 45	0.891 96	0.891 47	0.890 98	0.890 49	0.889 99	0.889 50
18	0.893 25	0.892 76	0.892 27	0.891 78	0.891 29	0.890 80	0.890 31	0.889 82	0.889 32	0.888 83
19	0.892 60	0.892 11	0.891 62	0.891 13	0.890 64	0.890 15	0.889 65	0.889 16	0.888 66	0.888 17
20	0.891 95	0.891 46	0.890 97	0.890 48	0.889 99	0.889 50	0.889 00	0.888 51	0.888 01	0.887 52
21	0.891 31	0.890 82	0.890 33	0.889 83	0.889 34	0.888 85	0.888 35	0.887 86	0.887 36	0.886 87
22	0.890 67	0.890 18	0.889 69	0.889 19	0.888 70	0.888 21	0.887 71	0.887 22	0.886 72	0.886 23
23	0.890 05	0.889 56	0.889 06	0.888 56	0.888 07	0.887 58	0.887 08	0.886 59	0.886 09	0.885 60
24	0.889 43	0.888 94	0.888 45	0.887 95	0.887 46	0.886 97	0.886 47	0.885 97	0.885 48	0.884 98
25	0.888 81	0.888 32	0.887 83	0.887 33	0.886 84	0.886 35	0.885 85	0.885 35	0.884 85	0.884 35
26	0.888 19	0.887 70	0.887 21	0.886 71	0.886 22	0.885 73	0.885 23	0.884 73	0.884 23	0.883 73
27	0.887 59	0.887 10	0.886 60	0.886 11	0.885 61	0.885 12	0.884 62	0.884 12	0.883 62	0.883 12
28	0.887 00	0.886 50	0.886 00	0.885 51	0.885 01	0.884 51	0.884 01	0.883 51	0.883 01	0.882 51
29	0.886 40	0.885 91	0.885 41	0.884 92	0.884 42	0.883 93	0.883 43	0.882 93	0.882 42	0.881 92
30	0.885 80	0.885 30	0.884 81	0.884 31	0.883 82	0.883 32	0.882 82	0.882 32	0.881 82	0.881 32
31	0.885 23	0.884 73	0.884 23	0.883 74	0.883 24	0.882 74	0.882 24	0.881 74	0.881 23	0.880 73
32	0.884 66	0.884 16	0.883 66	0.883 16	0.882 66	0.882 16	0.881 66	0.881 16	0.880 65	0.880 15
33	0.884 08	0.883 58	0.883 08	0.882 59	0.882 09	0.881 59	0.881 08	0.880 58	0.880 07	0.879 57
34	0.883 51	0.883 01	0.882 51	0.882 02	0.881 52	0.881 02	0.880 51	0.880 01	0.879 50	0.879 00
35	0.882 94	0.882 44	0.881 94	0.881 44	0.880 94	0.880 44	0.879 94	0.879 43	0.878 93	0.878 42
36	0.882 38	0.881 88	0.881 38	0.880 89	0.880 39	0.879 89	0.879 38	0.878 88	0.878 37	0.877 87
37	0.881 82	0.881 32	0.880 82	0.880 32	0.879 82	0.879 32	0.878 81	0.878 31	0.877 80	0.877 30
38	0.881 28	0.880 78	0.880 28	0.879 77	0.879 27	0.878 77	0.878 26	0.877 75	0.877 25	0.876 74
39	0.880 72	0.880 22	0.879 72	0.879 21	0.878 71	0.878 21	0.877 70	0.877 20	0.876 69	0.876 19
40	0.880 18	0.879 68	0.879 18	0.878 67	0.878 17	0.877 67	0.877 16	0.876 65	0.876 15	0.875 64

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	70.0	70.2	70.4	70.6	70.8	71.0	71.2	71.4	71.6	71.8
10	0.893 90	0.893 40	0.892 91	0.892 41	0.891 92	0.891 42	0.890 92	0.890 42	0.889 92	0.889 42
11	0.893 18	0.892 68	0.892 19	0.891 69	0.891 20	0.890 70	0.890 20	0.889 70	0.889 20	0.888 70
12	0.892 46	0.891 96	0.891 47	0.890 97	0.890 48	0.889 98	0.889 48	0.888 98	0.888 48	0.887 98
13	0.891 76	0.891 26	0.890 77	0.890 27	0.889 78	0.889 28	0.888 78	0.888 27	0.887 77	0.887 26
14	0.891 05	0.890 55	0.890 06	0.889 56	0.889 07	0.888 57	0.888 07	0.887 56	0.887 06	0.886 55
15	0.890 36	0.889 86	0.889 36	0.888 87	0.888 37	0.887 87	0.887 37	0.886 86	0.886 36	0.885 85
16	0.889 68	0.889 18	0.888 68	0.888 18	0.887 68	0.887 18	0.886 68	0.886 18	0.885 67	0.885 17
17	0.889 01	0.888 51	0.888 01	0.887 51	0.887 01	0.886 51	0.886 01	0.885 50	0.885 00	0.884 49
18	0.888 34	0.887 84	0.887 34	0.886 84	0.886 34	0.885 84	0.885 33	0.884 83	0.884 32	0.883 82
19	0.887 67	0.887 17	0.886 67	0.886 18	0.885 68	0.885 18	0.884 67	0.884 16	0.883 66	0.883 15
20	0.887 02	0.886 52	0.886 02	0.885 51	0.885 01	0.884 51	0.884 00	0.883 50	0.882 99	0.882 49
21	0.886 37	0.885 87	0.885 37	0.884 87	0.884 37	0.883 87	0.883 36	0.882 85	0.882 35	0.881 84
22	0.885 73	0.885 23	0.884 73	0.884 22	0.883 72	0.883 22	0.882 71	0.882 20	0.881 70	0.881 19
23	0.885 10	0.884 60	0.884 09	0.883 59	0.883 08	0.882 58	0.882 07	0.881 56	0.881 06	0.880 55
24	0.884 48	0.883 98	0.883 47	0.882 97	0.882 46	0.881 96	0.881 45	0.880 94	0.880 43	0.879 92
25	0.883 85	0.883 35	0.882 84	0.882 34	0.881 83	0.881 33	0.880 82	0.880 31	0.879 81	0.879 30
26	0.883 23	0.882 73	0.882 22	0.881 72	0.881 21	0.880 71	0.880 20	0.879 69	0.879 18	0.878 67
27	0.882 62	0.882 12	0.881 61	0.881 11	0.880 60	0.880 10	0.879 59	0.879 08	0.878 57	0.878 06
28	0.882 01	0.881 51	0.881 00	0.880 50	0.879 99	0.879 49	0.878 98	0.878 47	0.877 95	0.877 44
29	0.881 42	0.880 91	0.880 40	0.879 90	0.9879 39	0.878 88	0.878 37	0.877 86	0.877 35	0.876 84
30	0.880 82	0.880 31	0.879 80	0.879 30	0.878 79	0.878 28	0.877 77	0.877 26	0.876 74	0.876 23
31	0.880 23	0.879 72	0.879 21	0.878 71	0.878 20	0.877 69	0.877 18	0.876 67	0.876 15	0.875 64
32	0.879 65	0.879 14	0.878 63	0.878 13	0.877 62	0.877 11	0.876 60	0.876 08	0.875 57	0.875 05
33	0.879 06	0.878 55	0.878 05	0.877 54	0.877 04	0.876 53	0.876 01	0.875 50	0.874 98	0.874 47
34	0.878 49	0.877 98	0.877 47	0.876 96	0.876 45	0.875 94	0.875 43	0.874 91	0.874 40	0.873 88
35	0.877 92	0.877 41	0.876 90	0.876 39	0.875 88	0.875 37	0.874 85	0.874 34	0.873 82	0.873 31
36	0.877 36	0.876 85	0.876 34	0.875 82	0.875 31	0.874 80	0.874 28	0.873 77	0.873 25	0.872 74
37	0.876 79	0.876 28	0.875 77	0.875 25	0.874 74	0.874 23	0.873 71	0.873 20	0.872 68	0.872 17
38	0.876 23	0.875 72	0.875 21	0.874 69	0.874 18	0.873 67	0.873 15	0.872 64	0.872 12	0.871 61
39	0.875 68	0.875 17	0.874 66	0.874 14	0.873 63	0.873 12	0.872 60	0.872 08	0.871 57	0.871 05
40	0.875 13	0.874 61	0.874 10	0.873 58	0.873 07	0.872 55	0.872 03	0.871 51	0.871 00	0.870 48

Temperature °C	Percentages of Volume at 20°C									
	72.0	72.2	72.4	72.6	72.8	73.0	73.2	73.4	73.6	73.8
10	0.888 92	0.888 42	0.887 91	0.887 41	0.886 90	0.886 40	0.885 89	0.885 37	0.884 86	0.884 34
11	0.888 20	0.887 69	0.887 19	0.886 68	0.886 18	0.885 67	0.885 16	0.884 64	0.884 13	0.883 61
12	0.887 48	0.886 97	0.886 46	0.885 96	0.885 45	0.884 94	0.884 43	0.883 92	0.883 40	0.882 89
13	0.886 76	0.886 25	0.885 75	0.885 24	0.884 74	0.884 23	0.883 71	0.883 20	0.882 68	0.882 17
14	0.886 05	0.885 54	0.885 03	0.884 53	0.884 02	0.883 51	0.883 00	0.882 48	0.881 97	0.881 45
15	0.885 35	0.884 84	0.884 33	0.883 82	0.883 31	0.882 80	0.882 29	0.881 78	0.881 26	0.880 75
16	0.884 67	0.884 16	0.883 65	0.883 14	0.882 63	0.882 12	0.881 60	0.881 09	0.880 57	0.880 06
17	0.883 99	0.883 48	0.882 97	0.882 45	0.881 94	0.881 43	0.880 92	0.880 40	0.879 89	0.879 37
18	0.883 31	0.882 80	0.882 29	0.881 78	0.881 27	0.880 76	0.880 24	0.879 72	0.879 21	0.878 69
19	0.882 64	0.882 13	0.881 62	0.881 10	0.880 59	0.880 08	0.879 56	0.879 05	0.878 53	0.878 02
20	0.881 98	0.881 47	0.880 96	0.880 45	0.879 94	0.879 43	0.878 91	0.878 39	0.877 87	0.877 35
21	0.881 33	0.880 82	0.880 31	0.879 79	0.879 28	0.878 77	0.878 25	0.877 73	0.877 21	0.876 69
22	0.880 68	0.880 17	0.879 65	0.879 14	0.878 62	0.878 11	0.877 59	0.877 07	0.876 56	0.876 04
23	0.880 04	0.879 53	0.879 01	0.878 50	0.877 98	0.877 47	0.876 95	0.876 43	0.875 91	0.875 39
24	0.879 41	0.878 90	0.878 38	0.877 87	0.877 35	0.876 84	0.876 32	0.875 80	0.875 28	0.874 76
25	0.878 79	0.878 27	0.877 75	0.877 24	0.876 72	0.876 20	0.875 68	0.875 16	0.874 64	0.874 12
26	0.878 16	0.877 64	0.877 13	0.876 61	0.876 10	0.875 58	0.875 06	0.874 54	0.874 01	0.873 49
27	0.877 55	0.877 03	0.876 51	0.876 00	0.875 48	0.874 96	0.874 44	0.873 92	0.873 39	0.872 87
28	0.876 93	0.876 41	0.875 90	0.875 38	0.874 87	0.874 35	0.873 83	0.873 30	0.872 78	0.872 25
29	0.876 33	0.875 81	0.875 29	0.874 78	0.874 26	0.873 74	0.873 22	0.872 69	0.872 17	0.871 64
30	0.875 72	0.875 20	0.874 68	0.874 17	0.873 65	0.873 13	0.872 61	0.872 08	0.871 56	0.871 03
31	0.875 13	0.874 61	0.874 09	0.873 57	0.873 05	0.872 53	0.872 01	0.871 48	0.870 96	0.870 43
32	0.874 54	0.874 02	0.873 50	0.872 99	0.872 47	0.871 95	0.871 42	0.870 90	0.870 37	0.869 85
33	0.873 95	0.873 43	0.872 91	0.872 39	0.871 87	0.871 35	0.870 83	0.870 30	0.869 78	0.869 25
34	0.873 37	0.872 85	0.872 33	0.871 81	0.871 29	0.870 77	0.870 24	0.869 72	0.869 19	0.868 67
35	0.872 79	0.872 27	0.871 75	0.871 23	0.870 71	0.870 19	0.869 66	0.869 13	0.868 61	0.868 08
36	0.872 22	0.871 70	0.871 18	0.870 65	0.870 13	0.869 61	0.869 08	0.868 56	0.868 03	0.867 51
37	0.871 65	0.871 13	0.870 61	0.870 08	0.869 56	0.869 04	0.868 51	0.867 98	0.867 46	0.866 93
38	0.871 09	0.870 57	0.870 05	0.869 52	0.869 00	0.868 48	0.867 95	0.867 42	0.866 90	0.866 37
39	0.870 53	0.870 00	0.869 48	0.868 95	0.868 43	0.867 90	0.867 37	0.866 84	0.866 32	0.865 79
40	0.869 96	0.869 44	0.868 92	0.868 39	0.867 87	0.867 35	0.866 82	0.866 29	0.865 77	0.865 24

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	74.0	74.2	74.4	74.6	74.8	75.0	75.2	75.4	75.6	75.8
10	0.883 83	0.883 31	0.882 80	0.882 28	0.881 77	0.881 25	0.880 73	0.880 20	0.879 68	0.879 15
11	0.883 10	0.882 58	0.882 06	0.881 55	0.881 03	0.880 51	0.879 98	0.879 46	0.878 93	0.878 41
12	0.882 38	0.881 86	0.881 34	0.880 82	0.880 30	0.879 78	0.879 25	0.878 73	0.878 20	0.877 68
13	0.881 65	0.881 13	0.880 61	0.880 10	0.879 58	0.879 06	0.878 53	0.878 00	0.877 48	0.876 95
14	0.880 94	0.880 42	0.879 90	0.879 38	0.878 86	0.878 34	0.877 81	0.877 29	0.876 76	0.876 24
15	0.880 24	0.879 72	0.879 20	0.878 67	0.878 15	0.877 63	0.877 10	0.876 58	0.876 05	0.875 53
16	0.879 54	0.879 02	0.878 50	0.877 97	0.877 45	0.876 93	0.876 40	0.875 88	0.875 35	0.874 83
17	0.878 86	0.878 34	0.877 82	0.877 29	0.876 77	0.876 25	0.875 72	0.875 19	0.874 66	0.874 13
18	0.878 17	0.877 65	0.877 13	0.876 61	0.876 09	0.875 57	0.875 04	0.874 51	0.873 98	0.873 45
19	0.877 50	0.876 98	0.876 46	0.875 93	0.875 41	0.874 89	0.874 36	0.873 83	0.873 30	0.872 77
20	0.876 83	0.876 31	0.875 78	0.875 26	0.874 73	0.874 21	0.873 68	0.873 15	0.872 63	0.872 10
21	0.876 17	0.875 65	0.875 12	0.874 60	0.874 07	0.873 55	0.873 02	0.872 49	0.871 96	0.871 43
22	0.875 52	0.874 99	0.874 47	0.873 94	0.873 42	0.872 89	0.872 36	0.871 83	0.871 30	0.870 77
23	0.874 87	0.874 34	0.873 82	0.873 29	0.872 77	0.872 24	0871 71	0.871 18	0.870 64	0.870 11
24	0.874 24	0.873 71	0.873 19	0.872 66	0.872 14	0.871 61	0.871 08	0.870 55	0.870 01	0.869 48
25	0.873 60	0.873 07	0.872 55	0.872 02	0.871 50	0.870 97	0.870 44	0.869 90	0.869 37	0.868 83
26	0.872 97	0.872 44	0.871 92	0.871 39	0.870 87	0.870 34	0.869 81	0.869 28	0.868 74	0.868 21
27	0.872 35	0.871 82	0.871 29	0.870 77	0.870 24	0.869 71	0.869 18	0.868 65	0.868 11	0.867 58
28	0.871 73	0.871 20	0.870 67	0.870 15	0.869 62	0.869 09	0.868 56	0.868 02	0.867 49	0,866 95
29	0.871 12	0.870 59	0.870 06	0.869 54	0.869 01	0.868 48	0.867 95	0.867 41	0.866 88	0.866 34
30	0.870 51	0.869 98	0.869 45	0.868 93	0.868 40	0.867 87	0.867 33	0.866 79	0.866 26	0.865 72
31	0.869 91	0.869 38	0.868 85	0.868 32	0.867 79	0.867 26	0.866 72	0.866 19	0.865 65	0.865 12
32	0.869 32	0.868 79	0.868 26	0.867 73	0.867 20	0.866 67	0.866 13	0.865 59	0.865 06	0.864 52
33	0.868 73	0.868 20	0.867 67	0.867 13	0.866 60	0.866 07	0.865 53	0.864 99	0.864 46	0.863 92
34	0.868 14	0.867 61	0.867 08	0.866 54	0.866 01	0.865 48	0.864 94	0.864 40	0.863 87	0.863 33
35	0.867 55	0.867 02	0.866 49	0.865 95	0.865 42	0.864 89	0.864 35	0.863 81	0.863 28	0.862 74
36	0.866 98	0.866 45	0.865 91	0.865 38	0.864 84	0.864 31	0.863 77	0.863 23	0.862 70	0.862 16
37	0.866 40	0.865 87	0.865 33	0.864 80	0.864 26	0.863 73	0.863 19	0.862 65	0.862 12	0.861 58
38	0.865 84	0.865 30	0.864 77	0.864 23	0.863 70	0.863 16	0.862 62	0.862 08	0.861 54	0.861 00
39	0.865 26	0.864 73	0.864 19	0.863 66	0.863 12	0.862 59	0.862 05	0.861 51	0.860 98	0.860 44
40	0.864 71	0.864 17	0.863 64	0.863 10	0.862 57	0.862 03	0.861 49	0.860 95	0.860 41	0.859 87

Temperature °C	Percentages of Volume at 20°C									
	76.0	76.2	76.4	76.6	76.8	77.0	77.2	77.4	77.6	77.8
10	0.878 63	0.878 10	0.877 57	0.877 03	0.876 50	0.875 97	0.875 43	0.874 90	0.874 36	0.873 83
11	0.877 88	0.877 35	0.876 82	0.876 29	0.875 76	0.875 23	0.874 69	0.874 16	0.873 62	0.873 09
12	0.877 15	0.876 62	0.87609	0.875 56	0.875 03	0.874 50	0.873 96	0.873 42	0.872 89	0.872 35
13	0.876 42	0.875 89	0.875 36	0.874 83	0.874 30	0.873 77	0.873 23	0.872 69	0.872 15	0.871 61
14	0.875 71	0.875 18	0.874 64	0.874 11	0.873 57	0.873 04	0.872 50	0.871 96	0.871 43	0.870 89
15	0.875 00	0.874 47	0.873 93	0.873 40	0.872 86	0.872 33	0.871 79	0.871 25	0.870 71	0.870 17
16	0.874 30	0.873 77	0.873 23	0.872 70	0.872 16	0.871 63	0.871 09	0.870 55	0.870 00	0.869 46
17	0.873 60	0.873 07	0.872 54	0.872 00	0.871 47	0.870 94	0.870 40	0.869 86	0.869 31	0.868 77
18	0.872 92	0.872 38	0.871 85	0.871 31	0.870 78	0.870 24	0.869 70	0.869 16	0.868 62	0.868 08
19	0.872 24	0.871 71	0.871 17	0.870 64	0.870 10	0.869 57	0.869 03	0.868 49	0.867 94	0.867 40
20	0.871 57	0.871 03	0.870 50	0.869 96	0.869 43	0.868 89	0.868 35	0.867 81	0.867 16	0.866 72
21	0.870 90	0.870 36	0.869 83	0.869 29	0.868 76	0.868 22	0.867 68	0.867 13	0.866 59	0.866 04
22	0.870 24	0.869 70	0.869 17	0.868 63	0.868 10	0.867 56	0.867 02	0.866 47	0.865 93	0.865 38
23	0.869 58	0.869 04	0.868 50	0.867 97	0.867 43	0.866 89	0.866 35	0.865 80	0.865 26	0.864 71
24	0.868 95	0.868 41	0.867 87	0.867 34	0.866 80	0.866 26	0.865 72	0.865 17	0.864 63	0.864 08
25	0.868 30	0.867 76	0.867 22	0.866 69	0.866 15	0.865 61	0.865 07	0.864 52	0.863 98	0.863 43
26	0.867 68	0.867 14	0.866 60	0.866 05	0.865 51	0.864 97	0.864 42	0.863 88	0.863 33	0.862 79
27	0.867 05	0.866 51	0.865 97	0.865 43	0.864 89	0.864 35	0.863 80	0.863 25	0.862 71	0.862 16
28	0.866 42	0.865 88	0.865 34	0.864 79	0.864 25	0.863 71	0.863 16	0.862 62	0.862 07	0.861 53
29	0.865 81	0.865 27	0.864 73	0.864 18	0.863 64	0.863 10	0.862 55	0.862 01	0.861 46	0.860 92
30	0.865 18	0.864 64	0.864 10	0.863 56	0.863 02	0.862 48	0.861 93	0.861 38	0.860 84	0.860 29
31	0.864 58	0.864 04	0.863 50	0.862 95	0.862 41	0.861 87	0.861 32	0.860 77	0.860 23	0.859 68
32	0.863 98	0.863 44	0.862 90	0.862 35	0.861 81	0.861 27	0.860 72	0.860 17	0.859 63	0.859 08
33	0.863 38	0.862 84	0.862 30	0.861 75	0.861 21	0.860 67	0.860 12	0.859 57	0.859 02	0.858 47
34	0.862 79	0.862 25	0.861 71	0.861 16	0.860 62	0.860 08	0.859 53	0.858 98	0.858 43	0.857 88
35	0.862 20	0.861 66	0.861 11	0.860 57	0.860 02	0.859 48	0.858 93	0.858 38	0.857 83	0.857 28
36	0.861 62	0.861 08	0.860 53	0.859 90	0.859 44	0.858 90	0.858 35	0.857 80	0.857 24	0.856 69
37	0.861 04	0.860 49	0.859 95	0.859 40	0.858 86	0.858 31	0.857 76	0.857 21	0.856 66	0.856 11
38	0.860 46	0.859 92	0.859 37	0.858 83	0.858 28	0.857 74	0.857 19	0.856 64	0.856 08	0.855 53
39	0.859 90	0.859 35	0.858 80	0.858 26	0.857 71	0.857 16	0.856 61	0.856 06	0.855 50	0.854 95
40	0.859 33	0.858 78	0.858 23	0.857 69	0.857 14	0.856 59	0.856 04	0.855 48	0.854 93	0.854 37

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	78.0	78.2	78.4	78.6	78.8	79.0	79.2	79.4	79.6	79.8
10	0.873 29	0.872 75	0.872 21	0.871 66	0.871 12	0.870 58	0.870 03	0.869 48	0.868 92	0.868 37
11	0.872 55	0.872 00	0.871 46	0.870 91	0.870 37	0.869 82	0.869 27	0.868 72	0.868 17	0.867 62
12	0.871 81	0.871 27	0.870 72	0.870 18	0.869 63	0.869 09	0.868 54	0.867 99	0.867 43	0.866 88
13	0.871 07	0.870 53	0.869 98	0.869 44	0.868 89	0.868 35	0.867 80	0.867 25	0.866 70	0.866 15
14	0.870 35	0.869 80	0.869 26	0.868 71	0.868 17	0.867 62	0.867 07	0.866 52	0.865 96	0.865 41
15	0.869 63	0.869 08	0.868 54	0.867 99	0.867 45	0.866 90	0.866 35	0.865 80	0.865 24	0.864 69
16	0.868 92	0.868 38	0.867 83	0.867 29	0.866 74	0.866 20	0.865 64	0.865 09	0.864 53	0.863 98
17	0.868 23	0.867 68	0.867 13	0.866 59	0.866 04	0.865 49	0.864 94	0.864 39	0.863 83	0.863 28
18	0.867 54	0.866 99	0.866 44	0.865 90	0.865 35	0.864 80	0.864 25	0.863 69	0.863 14	0.862 58
19	0.866 86	0.866 31	0.865 76	0.865 21	0.864 66	0.864 11	0.863 55	0.863 00	0.862 44	0.861 89
20	0.866 18	0.865 63	0.865 08	0.864 53	0.863 98	0.863 43	0.862 87	0.862 32	0.861 76	0.861 21
21	0.865 50	0.864 95	0.864 40	0.863 86	0.863 31	0.862 76	0.862 20	0.861 64	0.861 09	0.860 53
22	0.864 84	0.864 29	0.863 74	0.863 19	0.862 64	0.862 09	0.861 53	0.860 98	0.860 42	0.859 87
23	0.864 17	0.863 62	0.863 07	0.862 52	0.861 97	0.861 42	0.860 87	0.860 31	0.859 76	0.859 20
24	0.863 54	0.862 99	0.862 44	0.861 88	0.861 33	0.860 78	0.860 22	0.859 66	0.859 11	0.858 55
25	0.862 89	0.862 34	0.861 79	0.861 23	0.860 68	0.860 13	0.859 57	0.859 01	0.858 46	0.857 90
26	0.862 24	0.861 69	0.861 14	0.860 59	0.860 04	0.859 49	0.858 93	0.858 37	0.857 81	0.857 25
27	0.861 61	0.861 06	0.860 51	0.859 95	0.859 40	0.858 85	0.858 29	0.857 73	0.857 18	0.856 62
28	0.860 98	0.860 43	0.859 88	0.859 32	0.858 77	0.858 22	0.857 66	0.857 10	0.856 54	0.855 98
29	0.860 37	0.859 81	0.859 26	0.858 70	0.858 15	0.857 59	0.857 03	0.856 47	0.855 91	0.855 35
30	0.859 74	0.859 19	0.858 63	0.858 08	0.857 52	0.856 97	0.856 41	0.855 85	0.855 28	0.854 72
31	0.859 13	0.858 58	0.858 02	0.857 47	0.856 91	0.856 36	0.855 80	0.855 24	0.854 68	0.854 12
32	0.858 53	0.857 97	0.857 42	0.856 86	0.856 31	0.855 75	0.855 19	0.854 63	0.854 06	0.853 50
33	0.857 92	0.857 36	0.856 81	0.856 25	0.855 70	0.855 14	0.854 58	0.854 02	0.853 45	0.852 89
34	0.857 33	0.856 77	0.856 21	0.855 66	0.855 10	0.854 54	0.853 98	0.853 42	0.852 85	0.852 29
35	0.856 73	0.856 17	0.855 62	0.855 06	0.854 51	0.853 95	0.853 39	0.852 82	0.852 26	0.851 69
36	0.856 14	0.855 58	0.855 02	0.854 47	0.853 91	0.853 35	0.852 79	0.852 22	0.851 66	0.851 09
37	0.855 56	0.855 00	0.854 44	0.853 88	0.853 32	0.852 76	0.852 20	0.851 63	0.851 07	0.850 50
38	0.854 98	0.854 42	0.853 86	0.853 31	0.852 75	0.852 19	0.851 62	0.851 05	0.850 49	0.849 92
39	0.854 40	0.853 84	0.853 28	0.852 73	0.852 17	0.851 61	0.851 04	0.850 47	0.849 91	0.849 34
40	0.853 82	0.853 26	0.852 70	0.852 14	0.851 58	0.851 02	0.850 45	0.849 89	0.849 32	0.848 76

Temperature °C	Percentages of Volume at 20°C									
	80.0	80.2	80.4	80.6	80.8	81.0	81.2	81.4	81.6	81.8
10	0.867 82	0.867 26	0.866 70	0.866 15	0.865 59	0.865 03	0.864 47	0.863 90	0.863 34	0.862 77
11	0.867 07	0.866 51	0.865 95	0.865 40	0.864 84	0.864 28	0.863 71	0.863 15	0.862 58	0.862 02
12	0.866 33	0..865 77	0.865 21	0.864 66	0.864 10	0.863 54	0.862 97	0.862 40	0.861 84	0.861 27
13	0.865 60	0.865 04	0.864 48	0.863 91	0.863 35	0.862 79	0.862 23	0.861 66	0.861 10	0.860 53
14	0.864 86	0.864 30	0.863 74	0.863 18	0.862 62	0.862 06	0.861 49	0.860 93	0.860 36	0.859 80
15	0.864 14	0.863 58	0.863 02	0.862 45	0.861 89	0.861 33	0.860 76	0.860 20	0.859 63	0.859 07
16	0.863 42	0.862 86	0.862 30	0.861 75	0.861 19	0.860 63	0.860 06	0.859 49	0.858 92	0.858 35
17	0.862 73	0.862 17	0.861 61	0.861 04	0.860 48	0.859 92	0.859 35	0.858 78	0.858 22	0.857 65
18	0.862 03	0.861 47	0.860 91	0.860 34	0.859 78	0.859 22	0.858 65	0.858 08	0.857 52	0.856 95
19	0.861 33	0.860 77	0.860 21	0.859 65	0.859 09	0.858 53	0.857 96	0.857 39	0.856 82	0.856 25
20	0.860 65	0.860 09	0.859 53	0.858 96	0.858 40	0.857 84	0.857 27	0.856 70	0.856 13	0.855 56
21	0.859 97	0.859 41	0.858 85	0.858 28	0.857 72	0.857 16	0.856 59	0.856 02	0.855 45	0.854 88
22	0.859 31	0.858 75	0.858 18	0.857 62	0.857 05	0.856 49	0.855 92	0.855 35	0.854 77	0.854 20
23	0.858 65	0.858 08	0.857 52	0.856 95	0.856 39	0.855 82	0.855 25	0.854 68	0.854 11	0.853 54
24	0.857 99	0.857 43	0.856 86	0.856 30	0.855 73	0.855 17	0.854 60	0.854 03	0.853 45	0.852 88
25	0.857 34	0.856 78	0.856 21	0.855 65	0.855 08	0.854 52	0.853 95	0.853 37	0.852 80	0.852 22
26	0.856 69	0.856 13	0.855 56	0.855 00	0.854 43	0.853 87	0.853 30	0.852 72	0.852 15	0.851 57
27	0.856 06	0.855 49	0.854 93	0.854 36	0.853 80	0.853 23	0.852 65	0.852 08	0.851 50	0.850 93
28	0.855 42	0.854 85	0.854 29	0.853 72	0.853 16	0.852 59	0.852 02	0.851 44	0.850 87	0.850 29
29	0.854 79	0.854 22	0.853 65	0.853 09	0.852 52	0.851 95	0.851 38	0.850 80	0.850 23	0.849 65
30	0.854 16	0.853 59	0.853 03	0.852 46	0.851 90	0.851 33	0.850 75	0.850 18	0.849 60	0.849 03
31	0.853 56	0.852 99	0.852 42	0.851 85	0.851 28	0.850 71	0.850 13	0.849 56	0.848 98	0.848 41
32	0.852 94	0.852 37	0.851 80	0.851 24	0.850 67	0.850 10	0.849 52	0.848 95	0.848 37	0.847 80
33	0.852 33	0.851 76	0.851 19	0.850 63	0.850 06	0.849 49	0.848 91	0.848 33	0.847 76	0.847 18
34	0.851 73	0.851 16	0.850 59	0.850 01	0.849 44	0.848 87	0.848 29	0.947 72	0.847 14	0.846 57
35	0.851 13	0.850 56	0.849 99	0.849 42	0.848 85	0.848 28	0.847 70	0.847 12	0.846 55	0.845 97
36	0.850 53	0.849 96	0.849 39	0.848 82	0.848 25	0.847 68	0.847 10	0.846 52	0.845 95	0.845 37
37	0.849 94	0.849 37	0.848 80	0.848 22	0.847 65	0.847 08	0.846 50	0.845 92	0.845 35	0.844 77
38	0.849 35	0.848 78	0.848 21	0.847 64	0.847 07	0.846 50	0.845 92	0.845 34	0.844 76	0.844 18
39	0.848 77	0.848 20	0.847 63	0.847 05	0.846 48	0.845 91	0.845 33	0.844 75	0.844 16	0.843 58
40	0.848 19	0.847 62	0.847 04	0.846 47	0.845 89	0.845 32	0.844 74	0.844 16	0.843 58	0.843 00

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	82.0	82.2	82.4	82.6	82.8	83.0	83.2	83.4	83.6	83.8
10	0.862 21	0.861 64	0.861 06	0.860 49	0.859 91	0.859 34	0.858 76	0.858 18	0.857 59	0.857 01
11	0.861 45	0.860 88	0.860 31	0.859 73	0.859 16	0.858 59	0.858 01	0.857 42	0.856 84	0.856 25
12	0.860 70	0.860 13	0.859 55	0.858 98	0.858 40	0.857 83	0.857 25	0.856 67	0.856 08	0.855 50
13	0.859 97	0.859 39	0.858 82	0.858 24	0.857 67	0.857 09	0.856 51	0.855 93	0.855 34	0.854 76
14	0.859 23	0.858 65	0.858 08	0.857 50	0.856 93	0.856 35	0.855 77	0.855 19	0.854 60	0.854 02
15	0.858 50	0.857 92	0.857 35	0.856 77	0.856 20	0.855 62	0.855 04	0.854 45	0.853 87	0.853 28
16	0.857 78	0.857 21	0.856 63	0.856 06	0.855 48	0.854 91	0.854 32	0.853 74	0.853 15	0.852 57
17	0.857 08	0.856 50	0.855 93	0.855 35	0.854 78	0.854 20	0.853 61	0.853 03	0.852 44	0.851 86
18	0.856 38	0.855 80	0.855 22	0.854 65	0.854 07	0.853 49	0.852 90	0.852 32	0.851 73	0.851 15
19	0.855 68	0.855 10	0.854 52	0.853 95	0.853 37	0.852 79	0.852 20	0.851 62	0.851 03	0.850 45
20	0.854 99	0.854 41	0.853 83	0.853 26	0.852 68	0.852 10	0.851 51	0.850 93	0.850 34	0.849 76
21	0.854 31	0.853 73	0.853 15	0.852 58	0.852 00	0.851 42	0.850 83	0.850 25	0.849 66	0.849 08
22	0.853 63	0.853 05	0.852 47	0.851 90	0.851 32	0.850 74	0.850 15	0.849 56	0.848 98	0.848 39
23	0.852 97	0.852 39	0.851 81	0.851 23	0.850 65	0.850 07	0.849 48	0.848 89	0.848 30	0.847 71
24	0.852 31	0.851 73	0.851 15	0.850 57	0.849 99	0.849 41	0.848 82	0.848 23	0.847 65	0.847 06
25	0.851 65	0.851 07	0.850 49	0.849 92	0.849 34	0.848 76	0.848 17	0.847 58	0.846 98	0.846 39
26	0.851 00	0.850 42	0.849 84	0.849 25	0.848 67	0.848 09	0.847 50	0.846 91	0.846 33	0.845 74
27	0.850 35	0.849 77	0.849 19	0.848 61	0.848 03	0.847 45	0.846 86	0.846 27	0.845 69	0.845 10
28	0.849 72	0.849 14	0.848 56	0.847 97	0.847 39	0.846 81	0.846 22	0.845 63	0.845 04	0.844 45
29	0.849 08	0.848 50	0.847 92	0.847 34	0.846 76	0.846 18	0.845 59	0.845 00	0.844 40	0.843 81
30	0.848 45	0.847 87	0.847 29	0.846 70	0.846 12	0.845 54	0.844 95	0.844 36	0.843 76	0.843 17
31	0.847 83	0.847 25	0.846 67	0.846 08	0.845 50	0.844 92	0.844 33	0.843 74	0.843 14	0.842 55
32	0.847 22	0.846 64	0.846 05	0.845 47	0.844 88	0.844 30	0.843 71	0.843 11	0.842 52	0.841 92
33	0.846 60	0.846 02	0.845 43	0.844 85	0.844 26	0.843 68	0.843 09	0.842 50	0.841 90	0.841 31
34	0.845 99	0.845 40	0.844 82	0.844 23	0.843 65	0.843 06	0.842 47	0.841 88	0.841 28	0.840 69
35	0.845 39	0.844 80	0.844 22	0.843 63	0.843 05	0.842 46	0.841 86	0.841 27	0.840 67	0.840 08
36	0.844 79	0.844 20	0.843 62	0.843 03	0.842 45	0.841 86	0.841 26	0.840 67	0.840 07	0.839 48
37	0.844 19	0.843 60	0.843 01	0.842 43	0.841 84	0.841 25	0.840 65	0.840 06	0.839 46	0.838 87
38	0.843 60	0.843 01	0.842 42	0.841 84	0.841 25	0.840 66	0.840 06	0.839 47	0.838 87	0.838 28
39	0.843 00	0.842 41	0.841 83	0.841 24	0.840 66	0.840 07	0.839 47	0.838 87	0.838 28	0.837 68
40	0.842 42	0.841 83	0.841 24	0.840 65	0.840 06	0.839 47	0.838 88	0.838 28	0.837 69	0.837 09

Temperature °C	Percentages of Volume at 20°C									
	84.0	84.2	84.4	84.6	84.8	85.0	85.2	85.4	85.6	85.8
10	0.856 43	0.855 84	0.855 25	0.854 65	0.854 06	0.853 47	0.852 87	0.852 27	0.851 67	0.851 07
11	0.855 67	0.855 08	0.854 49	0.853 90	0.853 31	0.852 72	0.852 12	0.851 51	0.850 91	0.850 30
12	0.854 92	0.854 33	0.853 74	0.853 14	0.852 55	0.851 96	0.851 36	0.850 76	0.850 16	0.849 56
13	0.854 18	0.853 59	0.852 99	0.852 40	0.851 80	0.851 21	0.850 61	0.850 01	0.849 40	0.848 80
14	0.853 44	0.852 85	0.852 25	0.851 66	0.851 06	0.850 47	0.849 87	0.849 27	0.848 66	0.848 06
15	0.852 70	0.852 11	0.851 52	0.850 92	0.850 33	0.849 74	0.849 14	0.848 53	0.847 93	0.847 32
16	0.851 98	0.851 39	0.850 79	0.850 20	0.849 60	0.849 01	0.848 41	0.847 81	0.847 20	0.846 60
17	0.851 27	0.850 68	0.850 09	0.849 49	0.848 90	0.848 31	0.847 70	0.847 10	0.846 49	0.845 89
18	0.850 56	0.849 97	0.849 38	0.848 78	0.848 19	0.847 60	0.846 99	0.846 39	0.845 78	0.845 18
19	0.849 86	0.849 27	0.848 68	0.848 08	0.847 49	0.846 90	0.846 29	0.845 69	0.845 08	0.844 48
20	0.849 17	0.848 57	0.847 98	0.847 38	0.846 79	0.846 19	0.845 59	0.44 98	0.844 38	0.843 77
21	0.848 49	0.847 89	0.847 30	0.846 70	0.846 11	0.845 51	0.844 90	0.844 30	0.843 69	0.843 09
22	0.847 80	0.847 20	0.846 61	0.846 01	0.845 42	0.844 82	0.844 21	0.843 61	0.843 00	0.842 40
23	0.847 12	0.846 52	0.845 93	0.845 33	0.844 74	0.844 14	0.843 53	0.842 93	0.842 32	0.841 72
24	0.846 47	0.845 87	0.845 27	0.844 68	0.844 08	0.843 48	0.842 87	0.842 27	0.841 66	0.841 06
25	0.845 80	0.845 20	0.844 61	0.844 01	0.843 42	0.842 82	0.842 21	0.841 61	0.841 00	0.840 40
26	0.845 15	0.844 55	0.843 96	0.843 36	0.842 77	0.842 17	0.841 56	0.840 95	0.840 34	0.839 73
27	0.844 51	0.843 91	0.843 31	0.842 71	0.842 11	0.841 51	0.840 90	0.840 30	0.839 69	0.839 09
28	0.843 86	0.843 26	0.842 66	0.842 06	0.841 46	0.840 86	0.840 25	0.839 65	0.839 04	0.838 44
29	0.843 22	0.842 62	0.842 02	0.841 43	0.840 83	0.840 23	0.839 62	0.839 01	0.838 40	0.837 79
30	0.842 58	0.841 98	0.841 38	0.840 79	0.840 19	0.839 59	0.838 98	0.838 37	0.837 76	0.837 15
31	0.841 96	0.841 36	0.840 76	0.840 16	0.839 56	0.838 96	0.838 35	0.837 74	0.837 13	0.836 52
32	0.841 33	0.840 73	0.840 13	0.839 54	0.838 94	0.838 34	0.837 73	0.837 12	0.836 51	0.835 90
33	0.840 72	0.840 12	0.839 52	0.838 91	0.838 31	0.837 71	0.837 10	0.836 49	0.835 88	0.835 27
34	0.840 10	0.839 50	0.838 90	0.838 29	0.837 69	0.837 09	0.836 48	0.835 87	0.835 25	0.834 64
35	0.839 48	0.838 88	0.838 28	0.837 67	0.837 07	0.836 47	0.835 86	0.835 25	0.834 64	0.834 03
36	0.838 88	0.838 28	0.837 68	0.837 07	0.836 47	0.835 87	0.835 26	0.834 65	0.834 03	0.833 42
37	0.838 27	0.837 67	0.837 07	0.836 46	0.835 86	0.835 26	0.834 65	0.834 04	0.833 42	0.832 81
38	0.837 68	0.837 08	0.836 47	0.835 87	0.835 26	0.834 66	0.834 05	0.833 44	0.832 82	0.832 21
39	0.837 08	0.836 48	0.835 87	0.835 27	0.834 66	0.834 06	0.833 45	0.832 83	0.832 22	0.831 60
40	0.836 50	0.835 89	0.835 28	0.834 68	0.834 07	0.833 46	0.832 85	0.832 23	0.831 62	0.831 00

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures—*Contd*

Temperature °C	Percentages of Volume at 20°C									
	86.0	86.2	86.4	86.6	86.8	87.0	87.2	87.4	87.6	87.8
10	0.850 47	0.849 86	0.849 25	0.848 63	0.848 02	0.847 41	0.846 79	0.846 16	0.845 54	0.844 91
11	0.849 70	0.849 09	0.848 48	0.847 87	0.847 26	0.846 65	0.846 02	0.845 40	0.844 77	0.844 15
12	0.848 96	0.848 35	0.847 73	0.847 12	0.846 50	0.845 89	0.845 27	0.844 64	0.844 02	0.843 39
13	0.848 20	0.847 59	0.846 97	0.846 36	0.845 74	0.845 13	0.844 51	0.843 88	0.843 26	0.842 63
14	0.847 46	0.846 85	0.846 23	0.845 62	0.845 00	0.844 39	0.843 76	0.843 14	0.842 51	0.841 89
15	0.846 72	0.846 11	0.845 49	0.844 88	0.844 26	0.843 65	0.843 02	0.842 40	0.841 77	0.841 15
16	0.846 00	0.845 39	0.844 77	0.844 16	0.843 54	0.842 93	0.842 30	0.841 67	0.841 05	0.840 42
17	0.845 28	0.844 67	0.844 05	0.843 44	0.842 82	0.842 21	0.841 58	0.840 95	0.840 33	0.839 70
18	0.844 57	0.843 96	0.843 34	0.842 73	0.842 11	0.841 50	0.840 87	0.840 24	0.839 62	0.838 99
19	0.843 87	0.843 25	0.842 64	0.842 02	0.841 41	0.840 79	0.840 16	0.839 54	0.838 91	0.838 29
20	0.843 17	0.842 56	0.841 94	0.841 33	0.840 71	0.840 10	0.839 47	0.838 84	0.838 22	0.837 59
21	0.842 48	0.841 86	0.841 25	0.840 63	0.840 02	0.839 40	0.838 77	0.838 14	0.837 52	0.836 89
22	0.841 79	0.841 17	0.840 56	0.839 94	0.839 33	0.838 71	0.838 08	0.837 45	0.836 83	0.836 20
23	0.841 11	0.840 49	0.839 88	0.839 26	0.838 65	0.838 03	0.837 40	0.836 77	0.836 15	0.835 52
24	0.840 45	0.839 83	0.839 22	0.838 60	0.837 99	0.837 37	0.836 74	0.836 11	0.835 49	0.834 86
25	0.839 79	0.839 17	0.838 55	0.837 94	0.837 32	0.836 70	0.836 07	0.835 44	0.834 81	0.834 18
26	0.839 12	0.838 50	0.837 89	0.837 27	0.836 66	0.836 04	0.835 41	0.834 78	0.834 16	0.833 53
27	0.838 48	0.837 86	0.837 24	0.836 62	0.836 00	0.835 38	0.834 75	0.834 12	0.833 50	0.832 87
28	0.837 83	0.837 21	0.836 59	0.835 98	0.835 36	0.834 74	0.834 11	0.833 48	0.832 84	0.832 21
29	0.837 18	0.836 56	0.835 94	0.835 33	0.834 71	0.834 09	0.833 46	0.832 83	0.832 20	0.831 57
30	0.836 54	0.835 92	0.835 30	0.834 68	0.834 06	0.833 44	0.832 81	0.832 18	0.831 56	0.830 93
31	0.835 91	0.835 29	0.834 67	0.834 05	0.833 43	0.832 81	0.832 18	0.831 55	0.830 92	0.830 29
32	0.835 29	0.834 67	0.834 05	0.833 43	0.832 81	0.832 19	0.831 56	0.830 93	0.830 29	0.829 66
33	0.834 66	0.834 04	0.833 42	0.832 79	0.832 17	0.831 55	0.830 92	0.830 29	0.829 66	0.829 03
34	0.834 03	0.833 41	0.832 79	0.832 17	0.831 55	0.830 93	0.830 30	0.829 67	0.829 03	0.828 40
35	0.833 42	0.832 80	0.832 18	0.831 55	0.830 93	0.830 31	0.829 68	0.829 05	0.828 41	0.827 78
36	0.832 81	0.832 19	0.831 57	0.830 94	0.830 32	0.829 70	0.829 07	0.828 43	0.827 80	0.827 16
37	0.832 20	0.831 58	0.830 95	0.830 33	0.829 70	0.829 08	0.828 45	0.827 82	0.827 18	0.826 55
38	0.831 60	0.830 98	0.830 35	0.829 73	0.829 10	0.828 48	0.827 85	0.827 21	0.826 58	0.825 94
39	0.830 99	0.830 37	0.829 75	0.829 12	0.828 50	0.827 88	0.827 24	0.826 61	0.825 97	0.825 34
40	0.830 39	0.829 77	0.829 14	0.828 52	0.827 89	0.827 27	0.826 64	0.826 00	0.825 37	0.824 73

Temperature °C	Percentages of Volume at 20°C									
	88.0	88.2	88.4	88.6	88.8	89.0	89.2	89.4	89.6	89.8
10	0.844 29	0.843 65	0.843 01	0.842 38	0.841 74	0.841 10	0.840 45	0.839 79	0.839 14	0.838 48
11	0.843 52	0.842 88	0.842 24	0.841 61	0.840 97	0.840 33	0.839 68	0.839 03	0.838 37	0.837 72
12	0.842 77	0.842 13	0.841 49	0.840 85	0.840 21	0.839 57	0.838 92	0.838 27	0.837 61	0.836 96
13	0.842 01	0.841 37	0.840 73	0.840 10	0.839 46	0.838 82	0.838 17	0.837 51	0.836 86	0.836 20
14	0.841 26	0.840 62	0.839 98	0.839 35	0.838 71	0.838 07	0.837 42	0.836 76	0.836 11	0.835 45
15	0.840 52	0.839 88	0.839 24	0.838 60	0.837 96	0.837 32	0.836 67	0.836 02	0.835 36	0.834 71
16	0.839 79	0.839 15	0.838 51	0.837 88	0.837 24	0.836 60	0.835 95	0.835 29	0.834 64	0.833 98
17	0.839 07	0.838 43	0.837 79	0.837 16	0.836 52	0.835 88	0.835 23	0.834 57	0.833 92	0.833 26
18	0.838 36	0.837 72	0.837 08	0.836 45	0.835 81	0.835 17	0.834 51	0.833 86	0.833 20	0.832 55
19	0.837 66	0.837 02	0.836 38	0.835 73	0.835 09	0.834 45	0.833 80	0.833 14	0.832 49	0.831 83
20	0.836 96	0.836 32	0.835 68	0.835 04	0.834 40	0.833 76	0.833 10	0.832 45	0.831 79	0.831 14
21	0.836 26	0.835 62	0.834 98	0.834 34	0.833 70	0.833 06	0.832 40	0.831 75	0.831 09	0.830 44
22	0.835 57	0.834 93	0.834 29	0.833 65	0.833 01	0.832 37	0.831 71	0.831 06	0.830 40	0.829 75
23	0.834 89	0.834 25	0.833 61	0.832 97	0.832 33	0.831 69	0.831 03	0.830 38	0.829 72	0.829 07
24	0.834 23	0.833 59	0.832 95	0.832 30	0.831 66	0.831 02	0.830 36	0.829 71	0.829 05	0.828 40
25	0.833 55	0.832 91	0.832 27	0.831 63	0.830 99	0.830 35	0.829 69	0.829 04	0.828 38	0.827 73
26	0.832 90	0.832 26	0.831 61	0.830 97	0.830 32	0.829 68	0.829 02	0.828 37	0.827 71	0.827 06
27	0.832 24	0.831 60	0.830 96	0.830 31	0.829 67	0.829 03	0.828 37	0.827 71	0.827 06	0.826 40
28	0.831 58	0.830 94	0.830 30	0.829 65	0.829 01	0.828 37	0.827 71	0.827 06	0.826 40	0.825 75
29	0.830 94	0.830 30	0.829 65	0.829 01	0.828 36	0.827 72	0.827 06	0.826 41	0.825 75	0.825 10
30	0.830 30	0.829 66	0.829 01	0.828 37	0.827 72	0.827 08	0.826 42	0.825 76	0.825 11	0.824 45
31	0.829 66	0.829 02	0.828 37	0.827 73	0.827 08	0.826 44	0.825 78	0.825 12	0.824 47	0.823 81
32	0.829 03	0.828 39	0.827 74	0.827 10	0.826 45	0.825 81	0.825 15	0.824 49	0.823 84	0.823 18
33	0.828 40	0.827 76	0.827 11	0.826 47	0.825 82	0.825 18	0.824 52	0.823 86	0.823 21	0.822 55
34	0.827 77	0.827 13	0.826 48	0.825 84	0.825 19	0.824 55	0.823 89	0.823 23	0.822 58	0.821 92
35	0.827 15	0.826 51	0.825 86	0.825 22	0.824 57	0.823 93	0.823 27	0.822 61	0.821 96	0.821 30
36	0.826 53	0.825 89	0.825 24	0.824 60	0.823 95	0.823 31	0.822 65	0.821 99	0.821 34	0.820 68
37	0.825 92	0.825 27	0.824 63	0.823 98	0.823 34	0.822 69	0.822 03	0.821 37	0.820 72	0.820 06
38	0.825 31	0.824 66	0.824 02	0.823 37	0.822 73	0.822 08	0.821 42	0.820 76	0.820 11	0.819 45
39	0.824 70	0.824 05	0.823 41	0.822 76	0.822 12	0.821 47	0.820 81	0.820 15	0.819 49	0.818 83
40	0.824 10	0.823 45	0.822 81	0.822 16	0.821 52	0.820 87	0.820 21	0.819 55	0.818 89	0.818 23

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	90.0	90.2	90.4	90.6	90.8	91.0	91.2	91.4	91.6	91.8
10	0.837 83	0.837 16	0.836 49	0.835 83	0.835 16	0.834 49	0.833 80	0.833 11	0.832 42	0.831 73
11	0.837 07	0.836 40	0.835 73	0.835 06	0.834 39	0.833 72	0.833 03	0.832 34	0.831 66	0.830 97
12	0.836 31	0.835 64	0.834 97	0.834 30	0.833 63	0.832 96	0.832 27	0.831 58	0.830 90	0.830 21
13	0.835 55	0.834 88	0.834 21	0.833 54	0.832 87	0.832 20	0.831 51	0.830 82	0.830 13	0.829 44
14	0.834 80	0.834 13	0.833 46	0.832 79	0.832 12	0.831 45	0.830 76	0.830 07	0.829 38	0.828 69
15	0.834 06	0.833 39	0.832 72	0.832 04	0.831 37	0.830 70	0.830 01	0.829 32	0.828 63	0.827 94
16	0.833 33	0.832 66	0.831 99	0.831 31	0.830 64	0.829 97	0.829 28	0.828 59	0.827 91	0.827 22
17	0.832 61	0.831 94	0.831 27	0.830 59	0.829 92	0.829 25	0.828 56	0.827 87	0.827 18	0.826 49
18	0.831 89	0.831 22	0.830 55	0.829 88	0.829 21	0.828 54	0.827 85	0.827 16	0.826 47	0.825 78
19	0.831 18	0.830 51	0.829 84	0.829 17	0.828 50	0.827 83	0.827 14	0.826 45	0.825 76	0.825 07
20	0.830 48	0.829 81	0.829 14	0.828 46	0.827 79	0.827 12	0.826 43	0.825 74	0.825 05	0.824 36
21	0.829 78	0.829 11	0.828 44	0.827 76	0.827 09	0.826 42	0.825 73	0.825 04	0.824 35	0.823 66
22	0.829 09	0.828 42	0.827 75	0.827 07	0.826 40	0.825 73	0.825 04	0.824 35	0.823 66	0.822 97
23	0.828 41	0.827 74	0.827 07	0.826 39	0.825 72	0.825 05	0.824 36	0.823 67	0.822 98	0.822 29
24	0.827 74	0.827 07	0.826 40	0.825 72	0.825 05	0.824 38	0.823 69	0.823 00	0.822 31	0.821 62
25	0.827 07	0.826 40	0.825 72	0.825 05	0.824 37	0.823 70	0.823 01	0.822 32	0.821 63	0.820 94
26	0.826 40	0.825 73	0.825 06	0.824 38	0.823 71	0.823 04	0.822 35	0.821 66	0.820 97	0.820 28
27	0.825 74	0.825 07	0.824 40	0.823 72	0.823 05	0.822 38	0.821 69	0.821 00	0.820 31	0.819 62
28	0.825 09	0.824 42	0.823 74	0.823 07	0.822 39	0.821 72	0.821 03	0.820 34	0.819 66	0.818 97
29	0.824 44	0.823 77	0.823 10	0.822 42	0.821 75	0.821 08	0.820 39	0.819 70	0.819 00	0.818 31
30	0.823 79	0.823 12	0.822 44	0.821 77	0.821 09	0.820 42	0.819 73	0.819 04	0.818 35	0.817 66
31	0.823 15	0.822 48	0.821 81	0.821 13	0.820 46	0.819 79	0.819 10	0.818 41	0.817 71	0.817 02
32	0.822 52	0.821 85	0.821 18	0.820 50	0.819 83	0.819 16	0.818 47	0.817 78	0.817 09	0.816 40
33	0.821 89	0.821 22	0.820 55	0.819 87	0.819 20	0.818 53	0.817 84	0.817 15	0.816 46	0.815 77
34	0.821 26	0.820 59	0.819 92	0.819 24	0.818 57	0.817 90	0.817 21	0.816 52	0.815 82	0.815 13
35	0.820 64	0.819 97	0.819 29	0.818 62	0.817 94	0.817 27	0.816 58	0.815 89	0.815 20	0.814 51
36	0.820 02	0.819 35	0.818 67	0.818 00	0.817 32	0.816 65	0.815 96	0.815 27	0.814 59	0.813 90
37	0.819 40	0.818 73	0.818 05	0.817 38	0.816 70	0.816 03	0.815 34	0.814 65	0.813 97	0.813 28
38	0.818 79	0.818 12	0.817 45	0.816 77	0.816 10	0.815 43	0.814 74	0.814 05	0.813 36	0.812 67
39	0.818 17	0.817 50	0.816 83	0.816 16	0.815 49	0.814 82	0.814 13	0.813 44	0.812 75	0.812 06
40	0.817 57	0.816 90	0.816 23	0.815 55	0.814 88	0.814 21	0.813 52	0.812 83	0.812 14	0.811 45

Temperature °C	Percentages of Volume at 20°C									
	92.0	92.2	92.4	92.6	92.8	93.0	93.2	93.4	93.6	93.8
10	0.831 04	0.830 33	0.829 62	0.828 92	0.828 21	0.827 50	0.826 77	0.826 03	0.825 30	0.824 56
11	0.830 28	0.829 57	0.828 86	0.828 15	0.827 44	0.826 73	0.826 00	0.825 26	0.824 53	0.823 79
12	0.829 52	0.828 81	0.828 10	0.827 38	0.826 67	0.825 96	0.825 23	0.824 49	0.823 76	0.823 02
13	0.828 75	0.828 04	0.827 33	0.826 63	0.825 92	0.825 21	0.824 47	0.823 74	0.823 00	0.822 27
14	0.828 00	0.827 29	0.826 58	0.825 87	0.825 16	0.824 45	0.823 72	0.822 98	0.822 25	0.821 51
15	0.827 25	0.826 54	0.825 83	0.825 13	0.824 42	0.823 71	0.822 97	0.822 24	0.821 50	0.820 77
16	0.826 53	0.825 82	0.825 11	0.824 40	0.823 69	0.822 98	0.822 24	0.821 51	0.820 77	0.820 04
17	0.825 80	0.825 09	0.824 38	0.823 67	0.822 96	0.822 25	0.821 52	0.820 78	0.820 05	0.819 31
18	0.825 09	0.824 38	0.823 67	0.822 95	0.822 24	0.821 53	0.820 79	0.820 06	0.819 32	0.818 59
19	0.824 38	0.823 67	0.822 96	0.822 24	0.821 53	0.820 82	0.820 09	0.819 35	0.818 62	0.817 88
20	0.823 67	0.822 96	0.822 25	0.821 54	0.820 83	0.820 12	0.819 38	0.818 65	0.817 91	0.817 18
21	0.822 97	0.822 26	0.821 55	0.820 84	0.820 13	0.819 42	0.818 68	0.817 95	0.817 21	0.816 48
22	0.822 28	0.821 57	0.820 86	0.820 15	0.819 44	0.818 73	0.818 00	0.817 26	0.816 53	0.815 79
23	0.821 60	0.820 89	0.820 18	0.819 46	0.818 75	0.818 04	0.817 30	0.816 57	0.815 83	0.815 10
24	0.820 93	0.820 22	0.819 51	0.818 79	0.818 08	0.817 37	0.816 63	0.815 90	0.815 16	0.814 43
25	0.820 25	0.819 54	0.818 83	0.818 12	0.817 41	0.816 70	0.815 96	0.815 23	0.814 49	0.813 76
26	0.819 59	0.818 88	0.818 17	0.817 45	0.816 74	0.816 03	0.815 30	0.814 56	0.813 83	0.813 09
27	0.818 93	0.818 22	0.817 51	0.816 79	0.816 08	0.815 37	0.814 64	0.813 90	0.813 17	0.812 43
28	0.818 28	0.817 57	0.816 86	0.816 14	0.815 43	0.814 72	0.813 98	0.813 25	0.812 51	0.811 78
29	0.817 62	0.816 91	0.816 20	0.815 49	0.814 78	0.814 07	0.813 33	0.812 60	0.811 86	0.811 13
30	0.816 97	0.816 26	0.815 55	0.814 83	0.814 12	0.813 41	0.812 68	0.811 94	0.811 21	0.810 47
31	0.816 33	0.815 62	0.814 91	0.814 20	0.813 49	0.812 78	0.812 05	0.811 31	0.810 58	0.809 84
32	0.815 71	0.815 00	0.814 29	0.813 57	0.812 86	0.812 15	0.811 42	0.810 69	0.809 95	0.809 22
33	0.815 08	0.814 37	0.813 66	0.812 95	0.812 24	0.811 53	0.810 80	0.810 06	0.809 33	0.808 59
34	0.814 44	0.813 73	0.813 02	0.812 32	0.811 61	0.810 90	0.810 17	0.809 43	0.808 70	0.807 96
35	0.813 82	0.813 11	0.812 40	0.811 70	0.810 99	0.810 28	0.809 55	0.808 81	0.808 08	0.807 34
36	0.813 21	0.812 50	0.811 79	0.811 08	0.810 37	0.809 66	0.808 93	0.808 20	0.807 46	0.806 73
37	0.812 59	0.811 88	0.811 17	0.810 46	0.809 75	0.809 04	0.808 31	0.807 58	0.806 85	0.806 12
38	0.811 98	0.811 27	0.810 56	0.809 85	0.809 14	0.808 43	0.807 70	0.806 97	0.806 24	0.805 51
39	0.811 37	0.810 66	0.809 95	0.809 25	0.808 54	0.807 83	0.807 10	0.806 37	0.805 65	0.804 92
40	0.810 76	0.810 05	0.809 35	0.808 64	0.807 94	0.807 23	0.806 50	0.805 77	0.805 05	0.804 32

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C									
	94.0	94.2	94.4	94.6	94.8	95.0	95.2	95.4	95.6	95.8
10	0.823 83	0.823 07	0.822 31	0.821 54	0.820 78	0.820 02	0.819 23	0.818 43	0.817 64	0.816 84
11	0.823 06	0.822 30	0.821 54	0.820 77	0.820 01	0.819 25	0.818 46	0.817 66	0.816 87	0.816 07
12	0.822 29	0.821 53	0.820 77	0.820 00	0.819 24	0.818 48	0.817 69	0.816 89	0.816 10	0.815 30
13	0.821 53	0.820 77	0.820 01	0.819 25	0.818 49	0.817 73	0.816 93	0.816 14	0.815 34	0.814 55
14	0.820 78	0.820 02	0.819 26	0.818 49	0.817 73	0.816 97	0.816 17	0.815 38	0.814 58	0.813 79
15	0.820 03	0.819 27	0.818 51	0.817 74	0.816 98	0.816 22	0.815 43	0.814 63	0.813 84	0.813 04
16	0.819 30	0.818 54	0.817 78	0.817 01	0.816 25	0.815 49	0.814 69	0.813 90	0.813 10	0.812 31
17	0.818 58	0.817 82	0.817 05	0.816 29	0.815 52	0.814 76	0.813 97	0.813 17	0.812 38	0.811 58
18	0.817 85	0.817 09	0.816 33	0.815 56	0.814 80	0.814 04	0.813 25	0.812 45	0.811 66	0.810 86
19	0.817 15	0.816 39	0.815 63	0.814 86	0.814 10	0.813 34	0.812 54	0.811 75	0.810 95	0.810 16
20	0.816 44	0.815 68	0.814 92	0.814 15	0.813 39	0.812 63	0.811 84	0.811 04	0.810 25	0.809 45
21	0.815 74	0.814 98	0.814 22	0.813 45	0.812 69	0.811 93	0.811 13	0.810 34	0.809 54	0.808 75
22	0.815 06	0.814 30	0.813 53	0.812 77	0.812 00	0.811 24	0.810 45	0.809 65	0.808 86	0.808 06
23	0.814 36	0.813 60	0.812 84	0.812 08	0.811 32	0.810 56	0.809 76	0.808 97	0.808 17	0.807 38
24	0.813 69	0.812 93	0.812 17	0.811 41	0.810 65	0.809 89	0.809 09	0.808 30	0.807 50	0.806 71
25	0.813 02	0.812 26	0.811 50	0.810 73	0.809 97	0.809 21	0.808 42	0.807 62	0.806 83	0.806 03
26	0.812 36	0.811 60	0.810 83	0.810 07	0.809 30	0.808 54	0.807 75	0.806 96	0.806 16	0.805 37
27	0.811 70	0.810 94	0.810 18	0.809 41	0.808 65	0.807 89	0.807 10	0.806 30	0.805 51	0.804 71
28	0.811 04	0.810 28	0.809 52	0.808 75	0.807 99	0.807 23	0.806 44	0.805 65	0.804 85	0.804 06
29	0.810 39	0.809 63	0.808 87	0.808 11	0.807 35	0.806 59	0.805 80	0.805 01	0.804 21	0.803 42
30	0.809 74	0.808 98	0.808 22	0.807 46	0.806 70	0.805 94	0.805 15	0.804 36	0.803 56	0.802 77
31	0.809 11	0.808 35	0.807 59	0.806 83	0.806 07	0.805 31	0.804 52	0.803 73	0.802 94	0.802 15
32	0.808 49	0.807 73	0.806 97	0.806 20	0.805 44	0.804 68	0.803 89	0.803 10	0.802 31	0.801 52
33	0.807 86	0.807 10	0.806 34	0.805 58	0.804 82	0.804 06	0.803 27	0.802 48	0.801 69	0.800 90
34	0.807 23	0.806 47	0.805 71	0.804 96	0.804 20	0.803 44	0.802 65	0.801 86	0.801 07	0.800 28
35	0.806 61	0.805 85	0.805 10	0.804 34	0.803 59	0.802 83	0.802 04	0.801 25	0.800 46	0.799 67
36	0.806 00	0.805 24	0.804 48	0.803 73	0.802 97	0.802 21	0.801 42	0.800 64	0.799 85	0.799 07
37	0.805 39	0.804 63	0.803 88	0.803 12	0.802 37	0.801 61	0.800 82	0.800 03	0.799 25	0.798 46
38	0.804 78	0.804 03	0.803 27	0.802 52	0.801 76	0.801 01	0.800 22	0.799 44	0.798 65	0.797 87
39	0.804 19	0.803 43	0.802 68	0.801 92	0.801 17	0.800 41	0.799 63	0.798 84	0.798 06	0.797 27
40	0.803 59	0.802 83	0.802 08	0.801 32	0.800 57	0.799 81	0.799 03	0.798 25	0.797 46	0.796 68

Temperature °C	Percentages of Volume at 20°C									
	96.0	96.2	96.4	96.6	96.8	97.0	97.2	97.4	97.6	97.8
10	0.816 05	0.815 22	0.814 39	0.813 56	0.812 73	0.811 90	0.811 02	0.810 14	0.809 26	0.808 38
11	0.815 28	0.814 45	0.813 62	0.812 78	0.811 95	0.811 12	0.810 24	0.809 36	0.808 49	0.807 61
12	0.814 51	0.813 68	0.812 85	0.812 02	0.811 19	0.810 36	0.809 48	0.808 60	0.807 72	0.806 84
13	0.813 75	0.812 92	0.812 09	0.811 25	0.810 42	0.809 59	0.808 71	0.807 83	0.806 96	0.806 08
14	0.812 99	0.812 16	0.811 33	0.810 50	0.809 67	0.808 84	0.807 96	0.807 08	0.806 21	0.805 33
15	0.812 25	0.811 42	0.810 59	0.809 75	0.808 92	0.808 09	0.807 21	0.806 33	0.805 46	0.804 58
16	0.811 51	0.810 68	0.809 85	0.809 02	0.808 19	0.807 36	0.806 48	0.805 60	0.804 73	0.803 85
17	0.810 79	0.809 96	0.809 13	0.808 29	0.807 46	0.806 63	0.805 75	0.804 87	0.804 00	0.803 12
18	0.810 07	0.809 24	0.808 41	0.807 57	0.806 74	0.805 91	0.805 03	0.804 15	0.803 28	0.802 40
19	0.809 36	0.808 53	0.807 70	0.806 87	0.806 04	0.805 21	0.804 33	0.803 45	0.802 57	0.801 69
20	0.808 66	0.807 83	0.806 99	0.806 16	0.805 32	0.804 49	0.803 61	0.802 74	0.801 86	0.800 99
21	0.807 95	0.807 12	0.806 29	0.805 46	0.804 63	0.803 80	0.802 92	0.802 05	0.801 17	0.800 30
22	0.807 27	0.806 44	0.805 61	0.804 77	0.803 94	0.803 11	0.802 23	0.801 35	0.800 48	0.799 60
23	0.806 58	0.805 75	0.804 92	0.804 09	0.803 26	0.802 43	0.801 55	0.800 67	0.799 80	0.798 92
24	0.805 91	0.805 08	0.804 25	0.803 42	0.802 59	0.801 76	0.800 88	0.800 01	0.799 13	0.798 26
25	0.805 24	0.804 41	0.803 58	0.802 74	0.801 91	0.801 08	0.800 21	0.799 33	0.798 46	0.797 58
26	0.804 58	0.803 75	0.802 92	0.802 09	0.801 26	0.800 43	0.799 55	0.798 68	0.797 80	0.796 93
27	0.803 92	0.803 09	0.802 26	0.801 43	0.800 60	0.799 77	0.798 89	0.798 02	0.797 14	0.796 27
28	0.803 27	0.802 44	0.801 61	0.800 78	0.799 95	0.799 12	0.798 25	0.797 37	0.796 50	0.795 62
29	0.802 63	0.801 80	0.800 97	0.800 14	0.799 31	0.798 48	0.797 61	0.796 73	0.795 86	0.794 98
30	0.801 98	0.801 15	0.800 32	0.799 50	0.798 67	0.799 84	0.796 97	0.796 09	0.795 22	0.794 34
31	0.801 36	0.800 53	0.799 70	0.798 87	0.798 04	0.797 21	0.796 34	0.795 47	0.794 59	0.793 72
32	0.800 73	0.799 90	0.799 08	0.798 25	0.797 43	0.796 60	0.795 73	0.794 85	0.793 98	0.793 10
33	0.800 11	0.799 28	0.798 46	0.797 63	0.796 81	0.795 98	0.795 11	0.794 23	0.793 36	0.792 48
34	0.799 49	0.798 66	0.797 84	0.797 01	0.796 19	0.795 36	0.794 49	0.793 62	0.792 74	0.791 87
35	0.798 88	0.798 05	0.797 23	0.796 40	0.795 58	0.794 75	0.793 88	0.793 01	0.792 14	0.791 27
36	0.798 28	0.797 45	0.796 63	0.795 80	0.794 98	0.794 15	0.793 28	0.792 41	0.791 54	0.790 67
37	0.797 67	0.796 85	0.796 02	0.795 20	0.794 37	0.793 55	0.792 68	0.791 81	0.790 94	0.790 07
38	0.797 08	0.796 26	0.795 44	0.794 61	0.793 79	0.792 97	0.792 10	0.791 23	0.790 36	0.789 49
39	0.796 49	0.795 67	0.794 85	0.794 02	0.793 20	0.792 38	0.791 51	0.790 64	0.789 77	0.788 90
40	0.795 90	0.795 08	0.794 26	0.793 43	0.792 61	0.791 79	0.790 92	0.790 05	0.789 19	0.788 32

(Continued)

Table 1 Apparent Relative Densities of Aqueous Ethanol at Various Temperatures —*Contd*

Temperature °C	Percentages of Volume at 20°C										
	98.0	98.2	98.4	98.6	98.8	99.0	99.2	99.4	99.6	99.8	100.0
10	0.807 50	0.806 57	0.805 63	0.804 70	0.803 76	0.802 83	0.801 82	0.800 81	0.799 79	0.798 78	0.797 77
11	0.806 73	0.805 79	0.804 86	0.803 92	0.802 99	0.802 05	0.801 04	0.800 03	0.799 02	0.798 01	0.797 00
12	0.805 96	0.805 03	0.804 09	0.803 16	0.802 22	0.801 29	0.800 28	0.799 27	0.798 25	0.797 24	0.796 23
13	0.805 20	0.804 27	0.803 33	0.802 40	0.801 46	0.800 53	0.799 52	0.798 51	0.797 50	0.796 49	0.795 48
14	0.804 45	0.803 52	0.802 58	0.801 65	0.800 71	0.799 78	0.798 77	0.797 76	0.796 75	0.795 74	0.794 73
15	0.803 70	0.802 77	0.801 83	0.800 90	0.799 96	0.799 03	0.798 02	0.797 01	0.796 01	0.795 00	0.793 99
16	0.802 97	0.802 04	0.801 10	0.800 17	0.799 23	0.798 30	0.797 29	0.796 28	0.795 28	0.794 27	0.793 26
17	0.802 24	0.801 31	0.800 38	0.799 44	0.798 51	0.797 58	0.796 57	0.795 56	0.794 56	0.793 55	0.792 54
18	0.801 52	0.800 59	0.799 66	0.798 72	0.797 79	0.796 86	0.795 85	0.794 85	0.793 84	0.792 84	0.791 83
19	0.800 81	0.799 88	0.798 95	0.798 01	0.797 08	0.796 15	0.795 14	0.794 14	0.793 13	0.792 13	0.791 12
20	0.800 11	0.799 18	0.798 25	0.797 31	0.796 38	0.795 45	0.794 44	0.793 44	0.792 43	0.791 43	0.790 42
21	0.799 42	0.798 49	0.797 55	0.796 62	0.795 68	0.794 75	0.793 75	0.792 74	0.791 74	0.790 73	0.789 73
22	0.798 72	0.797 79	0.796 86	0.795 93	0.795 00	0.794 07	0.793 07	0.792 06	0.791 06	0.790 05	0.789 05
23	0.798 04	0.797 11	0.796 18	0.795 25	0.794 32	0.793 39	0.792 39	0.791 38	0.790 38	0.789 37	0.788 37
24	0.797 38	0.796 45	0.795 52	0.794 58	0.793 65	0.792 72	0.791 72	0.790 71	0.789 71	0.788 70	0.787 70
25	0.796 71	0.795 78	0.794 85	0.793 92	0.792 99	0.792 06	0.791 06	0.790 05	0.789 05	0.788 04	0.787 04
26	0.796 05	0.795 12	0.794 19	0.793 25	0.792 32	0.791 39	0.790 39	0.789 39	0.788 38	0.787 38	0.786 38
27	0.795 39	0.794 46	0.793 53	0.792 60	0.791 67	0.790 74	0.789 74	0.788 74	0.787 73	0.786 73	0.785 73
28	0.794 75	0.793 82	0.792 89	0.791 96	0.791 03	0.790 10	0.789 10	0.788 10	0.787 09	0.786 09	0.785 09
29	0.794 11	0.793 18	0.792 25	0.791 32	0.790 39	0.789 46	0.788 46	0.787 46	0.786 45	0.785 45	0.784 45
30	0.793 47	0.792 54	0.791 61	0.790 68	0.789 75	0.788 82	0.787 82	0.786 82	0.785 81	0.784 81	0.783 81
31	0.792 85	0.791 92	0.790 99	0.790 06	0.789 13	0.788 20	0.787 20	0.786 19	0.785 19	0.784 18	0.783 18
32	0.792 23	0.791 30	0.790 37	0.789 44	0.788 51	0.787 58	0.786 58	0.785 58	0.784 57	0.783 57	0.782 57
33	0.791 61	0.790 68	0.789 75	0.788 83	0.787 90	0.786 97	0.785 97	0.784 96	0.783 96	0.782 95	0.781 95
34	0.791 00	0.790 07	0.789 14	0.788 21	0.787 28	0.786 35	0.785 35	0.784 34	0.783 34	0.782 33	0.781 33
35	0.790 40	0.789 47	0.788 54	0.787 61	0.786 68	0.785 75	0.784 74	0.783 74	0.782 73	0.781 73	0.780 72
36	0.789 80	0.788 87	0.787 94	0.787 02	0.786 09	0.785 16	0.784 15	0.783 14	0.782 14	0.781 13	0.780 12
37	0.789 20	0.788 27	0787 34	0.786 42	0.785 49	0.784 56	0.783 55	0.782 54	0.781 54	0.780 53	0.779 52
38	0.788 62	0.787 69	0.786 76	0.785 83	0.784 90	0.783 97	0.782 96	0.781 95	0.780 94	0.779 93	0.778 92
39	0.788 03	0.787 10	0.786 17	0.785 25	0.784 32	0.783 39	0.782 38	0.781 37	0.780 35	0.779 34	0.778 33
40	0.787 45	0.786 52	0.785 59	0.784 66	0.783 73	0.782 80	0.781 79	0.780 78	0.779 76	0.778 75	0.777 74

TABLE 2 CORRECTION VOLUME PERCENT TO CONVERT ETHANOL CONTENT BY VOLUME AT 20°C/ 20°C AS GIVEN IN TABLE 1 TO ETHANOL CONTENT BY VOLUME AT 15.56°C / 15.56°C OR 15°C/15°C

(*Clauses* 0.4, 1.1, 4.2, 5.4, 6 *and* 6.3)

Volume Percent at 20 °C/20 °C	*Subtract Correction to Convert to 15.56 °C/15.56 °C*	*Volume Percent at 15 °C/15 °C*
0	0.00	0.00
5	0.02	0.02
10	0.04	0.04
11.8	—	0.05–
11.9	—	0.05+
13.7	0.05–	—
13.8	0.05+	—
15	0.05_4	0.06
20	0.06_5	0.07
25	0.07	0.08
30	0.07	0.08
35	0.07	0.08
40	0.08	0.08
45	0.065	0.07
50	0.06	0.07
55	0.06	0.07
60	0.054	0.06
65	0.05 +	0.06
65.2	0.05 +	—
65.3	0.05 –	—
70	0.046	0.052
71.4	—	0.05 +
71.5	—	0.05 –
75	0.04	0.04
80	0.03	0.04
85	0.02	0.03
90	0.02	0.02
95	0.01	0.01
100	0.00	0.00

SUMMARY

(With Rounded Off Values)

Volume Percent at 20°C/20°C Range	*Subtract Correction to Convert to 15.56°C/15.56°C*	*Volume Percent at 15°C/15°C*
0 - 11.8	0.0	0.0
11.9 - 13.7	0.0	0.1
13.8 - 65.2	0.1	0.1
65.3 - 71.4	0.0	0.1
71.5 - 100	0.0	0.0

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.