Densities, Viscosities, Refractive Indices, and Speeds of Sound of the Binary Mixtures of Bis(2-methoxyethyl) Ether with Nonane, Decane, Dodecane, Tetradecane, and Hexadecane at 298.15, 308.15, and 318.15 K

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Densities, viscosities, refractive indices, and speeds of sound for the binary mixtures of bis(2-methoxyethyl) ether with nonane, decane, dodecane, tetradecane, and hexadecane have been measured at 298.15, 308.15, and 318.15 K over the entire range of mole fractions. From these results, the excess molar volumes and deviations in viscosity, refractivity, speed of sound, and isentropic compressibility have been calculated. These results are fitted to the Redlich-Kister polynomial relation to estimate the binary interaction parameters. The excess molar volumes and deviations in isentropic compressibility are positive, while the deviations in viscosity, speed of sound, and molar refractivity are negative. The results show a trend with the chain length of the alkanes.

Introduction

The present paper forms a part of our ongoing program of research to measure physical properties of the binary mixtures containing n-alkanes and the prediction of their excess properties (1-3). In previous papers from this laboratory, the binary mixtures of bis(2-methoxyethyl) ether (also called diglyme) with different organic liquids have been studied (3, 6-9). A search of the literature indicates the nonavailability of physical data on binary mixtures of diglyme with higher *n*-alkanes, i.e., C_9 , C_{10} , C_{12} , C_{14} , and C_{16} . In this paper, some new measurements on density, viscosity, refractive index, and speed of sound at 298.15, 308.15, and 318.15 K are presented for binary mixtures of diglyme with nonane, decane, dodecane, tetradecane, and hexadecane. From these properties, the excess molar volume and deviations in viscosity, molar refractivity, speed of sound, and isentropic compressibility have been calculated and used in the discussion of the binary interactions between mixing components.

Experimental Section

Materials. Bis(2-methoxyethyl) ether was purchased from BDH, England. The analytical grade solvents nonane, decane, dodecane, tetradecane, and hexadecane were from S.D. Fine Chemicals, Bombay. All the solvents were used directly as received. The purity of these solvents was ascertained by comparing their density, ρ , viscosity, η , refractive index, n_D , and speed of sound, u, with the available literature data (Table 1). The GLC analyses were made using a flame ionization detector (Nucon series, model 5700/5765, with fused silica columns) having a sensitivity better than 10⁻⁸ g of fatty acid/ μ L of solvent. The GLC purity analysis for each liquid is also included in Table 1.

Binary mixtures were prepared by mixing the appropriate volumes of pure liquids in specially designed ground-glass air-tight bottles and weighed on a single-pan Mettler balance (Switzerland, model AE-240) to an accuracy of ± 0.01 mg. The possible error in the mole fractions is estimated to be around ± 0.0001 .

Measurements. Densities of pure liquids and their binary mixtures in the mole fraction range of 0.1-0.9 were measured using a pycnometer having a bulb volume of 15 cm^3 and a capillary with an internal diameter of 1 mm. The details of

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Figure 1. Excess molar volumes at 298.15 K for diglyme + nonane (O), + decane (\oplus), + dodecane (Δ), + tetradecane (\Box), and + hexadecane (\blacksquare); solid line, Redlich-Kister equation.



Figure 2. Deviations in viscosity at 298.15 K for diglyme + *n*-alkanes. Symbols and lines have the same meaning as given in Figure 1.

the measurement techniques are the same as given earlier (1-9). Densities at 298.15, 308.15, and 318.15 K are considered precise to 0.0001 g·cm⁻³. An average of triplicate measurements was taken into account, and these were generally reproducible within ± 0.0002 g·cm⁻³.

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Table 1.	Comparison of Experimental	Densities (ρ) ,	Viscosities	(ŋ), and	Refractive	Indices ((n _D) of Pure	Liquids	with
Literatur	e Values at 298.15 K								

liquid	ρ/9	(g•cm ^{−3})	$\eta/$	(mPa·s)	$n_{ m D}$		
(mol % purity)	expt	lit.	expt	lit.	expt	lit.	
diglyme (>99.4)	0.9399	0.9397 (13) 0.9392 (14)	0.991	0.990 (15)	1.4058	1.4060 (13)	
nonane (>99.6)	0.7145	0.7139 (16)	0.655	0.657 (17)	1.4034	1.4042 (16)	
decane (>99.5)	0.7265	0.7262 (16)	0.831	0.843 (18)	1.4101	1.4098 (16)	
dodecane (>99.2)	0.7461	0.7457 (16)	1.324	1.345 (17)	1.4192	1.4197 (16)	
tetradecane (>99.7)	0.7608	0.7599 (1)	2.025	2.035 (1)	1.4270	1.4260 (1)	
hexadecane (>99.3)	0.7707	0.7703 (18)	3.005	3.078 (19)	1.4338	1.4328 (20)	

Viscosities were measured with a Cannon Fenske viscometer (size 100) supplied by Industrial Research Glassware Ltd., New Jersey. An electronic stop watch with a precision of ± 0.01 s was used to measure the flow times. Triplicate

Table 2. Experimental Densities (ρ), Viscosities (η), Refractive Indices (n_D), and Speeds of Sound (u) of Binary Mixtures at Different Temperatures

x 1	$ ho/(g\cdot cm^{-3})$	$\eta/(mPa \cdot s)$	n_{D}	$u/(\mathbf{m}\cdot\mathbf{s}^{-1})$	x 1	$ ho/(g\cdot cm^{-3})$	$\eta/(mPa\cdot s)$	$n_{ m D}$	$u/(\mathbf{m}\cdot\mathbf{s}^{-1})$
			Bis(2-n	nethoxyethyl) l	Ether (1) + N	Jonane (2)			-
				298.	15 K				
0.0000	0.7145	0.655	1.4034	1209	0.5963	0.8305	0.747	1.4018	1219
0.0991	0.7305	0.642	1.4028	1204	0.6999	0.8559	0.794	1.4027	1230
0.2003	0.7481	0.640	1.4019	1200	0.7997	0.8817	0.836	1.4036	1250
0.3005	0.7670	0.665	1.4017	1204	0.8970	0.9092	0.898	1 4049	1262
0.3982	0 7868	0.691	1 4014	1199	1 0000	0 9399	0.992	1 4058	1202
0.5002	0.1000	0.712	1 4017	1910	1.0000	0.0000	0.002	1.4000	1204
0.0023	0.0009	0.712	1.4017	1210	15 12				
0.0000	0 5000	0 5 8 8	1 0000	308.	10 K	0.0010	0.045	1 0070	1100
0.0000	0.7068	0.577	1.3989	1166	0.5963	0.8213	0.647	1.3973	1180
0.0991	0.7224	0.559	1.3983	1164	0.6999	0.8465	0.685	1.3978	1196
0.2003	0.7398	0.560	1.3972	1162	0.7997	0.8720	0.718	1.3990	1205
0.3005	0.7585	0.579	1.3970	1163	0.8970	0.8995	0.768	1.4001	1224
0.3982	0.7779	0.600	1.3968	1164	1.0000	0.9301	0.845	1.4012	1250
0.5023	0.7998	0.618	1.3968	1175					
				318.	15 K				
0.0000	0.6990	0.505	1.3938	1126	0.5963	0.8121	0.561	1.3918	1140
0.0991	0.7143	0.490	1.3935	1125	0.6999	0.8372	0.591	1.3924	1158
0.2003	0.7316	0.490	1.3929	1124	0.7997	0.8626	0.620	1.3937	1170
0.3005	0 7500	0.507	1 3920	1125	0.8970	0.8898	0.662	1 3951	1185
0.3082	0.7693	0.523	1 3914	1125	1 0000	0.9202	0.728	1 3967	1203
0.5023	0.7909	0.538	1.3914	1125	1.0000	0.5202	0.720	1.3507	1203
0.00120			Big(2-r	nethowyethyl)]	Ether $(1) + T$	Jecone (2)			
			D18(2-1	nethoxyethyl)	15 12	vecane (2)			
0.0000	0.000	0.001	1 4101	1000	10 K	0.0450	0.004	1 4045	1004
0.0000	0.7265	0.831	1.4101	1239	0.6592	0.8492	0.834	1.4045	1234
0.1008	0.7405	0.798	1.4088	1229	0.7010	0.8553	0.846	1.4047	1238
0.2018	0.7559	0.788	1.4075	1222	0.7987	0.8801	0.869	1.4046	1254
0.3025	0.7727	0.787	1.4066	1222	0.9013	0.9093	0.915	1.4053	1264
0.3984	0.7900	0.790	1.4058	1219	1.0000	0.9399	0.992	1.4058	1284
0.4993	0.8101	0.800	1.4055	1221					
				308.	15 K				
0.0000	0.7189	0.717	1.4055	1190	0.6592	0.8360	0.716	1.3998	1196
0.1008	0.7326	0.689	1.4040	1186	0.7010	0.8460	0.726	1.4003	1198
0.2018	0.7478	0.682	1.4029	1183	0.7987	0.8707	0.746	1.4004	1206
0.3025	0.7645	0.679	1.4017	1182	0.9013	0.8995	0.784	1.4007	1224
0.3984	0.7815	0.680	1.4013	1179	1.0000	0.9301	0.845	1.4012	1250
0.4993	0.8013	0.688	1.4008	1182			0.010		
				318.	15 K				
0.0000	0.7114	0.619	1.4009	1158	0.6592	0.8270	0.618	1.3955	1150
0 1008	0 7249	0.597	1 3993	1151	0 7010	0.8369	0.627	1 3956	1158
0.2018	0 7399	0.590	1 3980	1147	0 7987	0.8613	0 643	1 3958	1173
0.2010	0.7563	0.590	1 3071	1149	0.0013	0.0010	0.040	1 2061	1196
0.3023	0.7000	0.565	1 2062	1140	1 0000	0.0000	0.074	1.0007	1000
0.4993	0.7930	0.597	1.3961	1141	1.0000	0.9202	0.720	1.3507	1203
			Bis(2-m	ethoyyethyl) E	ther $(1) + Dc$	vdecene (2)			
			1310(2 m	2000 g 200 g 200 g 200 g	15 V				
0 0000	0.7461	1 204	1 4109	1020	0 6015	0.8940	1.000	1 4109	1940
0.0000	0.7401	1 992	1 4170	1071	0.0010	0.0340	1.020	1 4000	1050
0.1009	0.7000	1.230	1,41/8	1000	0.7024	0.0000	1.001	1.4093	1200
0.1999	0.7007	1.107	1.4100	1203	0.0008	0.0602	0.981	1.4082	1257
0.2993	0.7822	1.110	1.4100	1257	0.9003	0.9085	0.980	1.4076	1268
0.4034	0.7981	1.074	1.4136	1252	1.0000	0.9399	0.992	1.4058	1284
0.5021	0.8150	1.043	1.4119	1250					
0.0000	0 5000	1 100		308.	15 K	0.0071	0.0		
0.0000	0.7386	1.106	1.4161	1241	0.6015	0.8251	0.865	1.4059	1212
0.1009	0.7492	1.038	1.4142	1233	0.7024	0.8468	0.849	1.4048	1213
0.1998	0.7609	0.976	1.4118	1225	0.8008	0.8708	0.837	1.4039	1219
0.2993	0.7742	0.940	1.4097	1218	0.9003	0.8988	0.835	1.4025	1229
0.4034	0.7899	0.909	1.4084	1214	1.0000	0.9301	0.845	1.4012	1250
0.5021	0.8064	0.884	1.4071	1212					

Table 2 (C	Continued)								
<i>x</i> ₁	$ ho/(extrm{g-cm})$	$\eta/(mPa\cdot s)$	n _D	$u/(m \cdot s^{-1})$	<i>x</i> ₁	ρ/(g•cm ⁻³)	η/(mPa·s)	n _D	u/(m·s ⁻¹)
			Bis(2-m	ethoxyethyl) E	ther $(1) + D$	odecane (2)			
				318.	15 K				
0.0000	0.7314	0.935	1.4114	1207	0.6015	0.8166	0.743	1.4016	1173
0.1009	0.7417	0.880	1.4097	1196	0.7024	0.8378	0.728	1.4002	1174
0.1998	0.7532	0.830	1.4080	1188	0.8008	0.8615	0.720	1.3988	1178
0.2993	0.7663	0.801	1.4064	1182	0.9003	0.8891	0.719	1.3976	1189
0.4034	0.7818	0.780	1.4049	1176	1.0000	0.9202	0.728	1.3967	1203
0.5021	0.7979	0.757	1.4033	1174					
			Bis(2-me	thoxyethyl) Eth	ner (1) + Tet	radecane (2)			
				298.	15 K				
0.0000	0.7608	2.025	1.4270	1317	0.5940	0.8345	1.275	1.4146	1266
0.0987	0.7694	1.835	1.4252	1304	0.6981	0.8551	1.187	1.4122	1264
0.2023	0.77 99	1.672	1.4232	1293	0.7958	0.8780	1.113	1.4102	1265
0.3020	0.7915	1.550	1.4210	1285	0.8986	0.9067	1.044	1.4079	1269
0.4002	0.8039	1.448	1.4191	1277	1.0000	0.9399	0.992	1.4058	1284
0.5033	0.8191	1.345	1.4167	1270					
				308.	15 K				
0.0000	0.7536	1.646	1.4231	1278	0.5940	0.8259	1.068	1.4098	1229
0.0987	0.7620	1.503	1.4212	1263	0.6981	0.8463	0.996	1.4073	1227
0.2023	0.7729	1.380	1.4190	1254	0.7958	0.8687	0.938	1.4053	1227
0.3020	0.7832	1.290	1.4168	1246	0.8986	0.8972	0.888	1.4033	1230
0.4002	0.7958	1.205	1.4145	1238	1.0000	0.9301	0.845	1.4012	1250
0.5033	0.8108	1.122	1.4118	1232		0.0001	01010	1.1012	1200
				318	15 K				
0.0000	0.7464	1.356	1 4190	1241	0 5940	0.8174	0.902	1 4054	1189
0.0000	0.7546	1.000	1 4165	1991	0.6091	0.0174	0.002	1 4022	1105
0.0001	0.7647	1 159	1 4149	1019	0.0301	0.0575	0.040	1 4014	1107
0.2020	0.7047	1.100	1.4142	1210	0.1900	0.0000	0.800	1.4014	1109
0.3020	0.7700	1.070	1.4120	1210	0.0900	0.0070	0.760	1.4010	1192
0.4002	0.7677	0.945	1.4099	1192	1.0000	0.9202	0.728	1.3907	1203
0.0000	0.0020	0.040	Bis(2-me	thoxvethyl) Etl	her (1) + He:	xadecane (2)			
					15 K				
0.0000	0.7707	3.005	1.4338	1342	0.6013	0.8364	1.568	1.4188	1282
0.1013	0.7778	2.629	1.4310	1326	0.7004	0.8547	1.400	1 4157	1276
0.2067	0.7865	2.359	1.4288	1315	0.7997	0.8773	1.262	1.4124	1271
0.3071	0.7965	2.101	1.4261	1306	0.9021	0.9065	1.106	1.4094	1270
0.4030	0.8073	1.900	1.4242	1296	1 0000	0.9399	0.992	1 4058	1284
0.5078	0.8213	1.721	1.4211	1289	1.0000	0.0000	0.002		1201
				308.	15 K				
0.0000	0.7637	2.381	1.4293	1305	0.6013	0.8279	1.290	1.4143	1244
0.1013	0.7706	2.107	1.4265	1294	0 7004	0.8460	1 173	1 4113	1238
0 2067	0.7793	1 885	1 4245	1286	0 7997	0.8683	1.058	1 4083	1234
0.3071	0 7888	1 712	1 4216	1275	0.9021	0.8969	0.034	1.4046	1990
0.4030	0.7000	1 559	1 4178	1264	1 0000	0.0303	0.945	1 4019	1255
0.5078	0.8133	1 414	1 4166	1250	1.0000	0.0001	0.040	1.4012	1200
0.0010	0.0100	1.414	1.4100	1200	12				
0 0000	0 7568	1 090	1 4954	318. 1967	10 K	0 8107	1 090	1 4004	1905
0.0000	0.7000	1 600	1 4000	1955	0.0013	0.0101	1.000	1.4074	1100
0.1010	0.7000	1 515	1 4005	1200	0.7004	0.00/0	0.004	1,4000	1105
0.2007	0.7014	1.010	1,4200	1244	0.1991	0.0090	0.890	1.4038	1102
0.3071	0.7814	1.000	1.41/4	1231	0.9021	0.0070	0.799	1.3997	1197
0.4030	0.7919	1.200	1.4140	1220	1.0000	0.9202	0.728	1.3967	1203
0.5078	0.8054	1.178	1.4119	1211					

measurements of flow times were reproducible within ± 0.01 s. The calibration procedures of the viscometers and the experimental details are the same as given earlier (1-9). Viscosities are accurate to ± 0.001 mPa·s.

Refractive indices were measured for the sodium-D line with a thermostated Abbe refractometer (Bellingham and Stanley Ltd., London). The refractometer was calibrated by means of a glass test piece of known refractive index supplied by the manufacturer. Water was circulated into the instrument through a thermostatically controlled bath. Mixtures were directly injected into the prism assembly of the instrument using an air-tight hypodermic syringe, and the refractive index measurements were done when the liquids or the mixtures attained the constant temperature of the refractometer. This procedure was repeated at least three times, and the average of these readings was taken for the calculation of refractive index values. Refractive indices are accurate to ± 0.0002 unit.

Speed of sound results were obtained using a variablepath single-crystal interferometer (Mittal Enterprises, New



Figure 3. Deviations in speed of sound at 298.15 K for diglyme + *n*-alkanes. Symbols and lines have the same meaning as given in Figure 1.



Figure 4. Deviations in molar refractivity at 298.15 K for diglyme + *n*-alkanes. Symbols and lines have the same meaning as given in Figure 1.



Figure 5. Deviations in isentropic compressibility at 298.15 K for diglyme + n-alkanes. Symbols and lines have the same meaning as given in Figure 1.

Delhi, model M-84) as per the experimental details given earlier (1-9). The cell used was of 4 MHz. Speed of sound data are accurate to $\pm 2 \text{ m} \cdot \text{s}^{-1}$.

In all the property measurements, an INSREF, model 016 AP, thermostat was used within the temperature control of ± 0.01 K at the desired temperature as checked by means of a calibrated thermometer with an accuracy of ± 0.1 K. The results of binary mixtures compiled in Table 2 are the averages of at least three independent measurements for each composition of the mixture.

Results and Discussion

Excess molar volumes of the binary mixtures have been calculated as

$$V^{\rm E}/({\rm cm}^3 \cdot {\rm mol}^{-1}) = V_{\rm m} - V_1 x_1 - V_2 x_2$$
 (1)

where V_1 , V_2 , and V_m are the molar volumes of components 1 and 2 and of the mixture, respectively, and x_1 and x_2 represent the mole fractions of components 1 and 2. The molar volume of the mixture and those of the individual components are calculated as

$$V_{\rm m} = \frac{M_1 x_1 + M_2 x_2}{\rho_{\rm m}}$$
 $V_1 = \frac{M_1}{\rho_1}$ $V_2 = \frac{M_2}{\rho_2}$ (2)

where M_1 and M_2 are the molecular weights and ρ_1 , ρ_2 , and ρ_m represent the densities of pure components 1 and 2 and of the binary mixture, respectively.



Figure 6. Temperature dependence of excess molar volume, and deviations in viscosity, speed of sound, and isentropic compressibility for diglyme + tetradecane at 298.15 K (\odot) and 318.15 K (\odot); solid line, Redlich-Kister equation.



Figure 7. Temperature dependence of the deviations in molar refractivity for diglyme + tetradecane at 298.15 K (\odot) and 318.15 K (\odot); solid line, Redlich-Kister equation.

The deviations in viscosity, $\Delta \eta$, molar refractivity, ΔR , speed of sound, Δu , and isentropic compressibility, Δk_s , have been calculated from the general relation

$$\Delta Y = Y_{\rm m} - Y_1 C_1 - Y_2 C_2 \tag{3}$$

where ΔY refers to $\Delta \eta$, ΔR , Δu , and Δk_s . Y_m is the measured mixture property under question, whereas Y_i refer to the properties of the pure components of the mixture. The terms C_1 and C_2 are mixture compositions expressed as mole fraction for $\Delta \eta$ and Δu . For calculating ΔR and Δk_s , the volume fraction, ϕ_i , defined by eq 4

$$\phi_i = x_i V_i / \sum_{i=1}^{2} x_i V_i$$
(4)

is used for C_i .

The excess molar volumes as well as other properties, viz., $\Delta \eta$, Δu , ΔR , and Δk_s , have been fitted to the Redlich-Kister (10) relation

$$\Delta Y \text{ or } V^{\mathbf{E}} = C_1 C_2 \sum_{i=0}^{4} A_i (C_2 - C_1)^i$$
 (5)

to estimate the binary interaction coefficients A_i by the method of nonlinear least squares (Marquardt algorithm). The standard errors, σ , between the calculated and the

	function	T/K	A_0	A_1	A_2	A_3	A4	σ	function	T/K	A ₀	<i>A</i> ₁	A_2	A_3	A4	σ
$ \begin{tabular}{ cm^+mol^+ } $ 298.15 & 4.670 0.686 & 0.913 0.605 & -0.874 0.022 $ $ $ $ $ $ 0.8715 0.022 $ $ $ $ 0.15 80.15 80.12 $ $ $ 0.12 $ $ $ 0.15 80.15 80.12 $ $ $ $ 0.12 $ $ $ 0.15 80.15 80.12 $ $ $ $ 0.12 $ $ $ 0.15 $ $ $ 0.12 $ $ $ 0.15 $ $ $ 0.12 $ $ $ 0.15 $ $ $ 0.12 $ $ 0.15 $ $ $ 0.12 $ $ 0.15 $ $ $ 0.12 $ $ 0.15 $ $ 0.12 $ $ 0.15 $ $ 0.12 $ $ 0.14 $ $ 0.58 $ 0.13 $ $ $ 0.14 $ $ 0.58 $ 0.12 $ $ 0.14 $ $ 0.58 $ 0.12 $ $ 0.14 $ $ 0.58 $ 0.12 $ $ 0.14 $ $ 0.58 $ 0.12 $ $ 0.14 $ $ 0.58 $ 0.02 $ -0.16 $ 0.05 $ $ 0.14 $ $ 0.58 $ 0.02 $ -0.16 $ 0.05 $ $ 0.14 $ $ 0.58 $ 0.02 $ -0.18 $ 0.55 $ -0.68 $ 0.25 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.55 $ -0.68 $ 0.52 $ -0.66 $ 0.52 $ -0.60 $ 0.17 $ 0.000 $ $ $ $ 0.16 $ -0.58 $ -0.58 $ 0.55 $ -0.50 $ 0.25 $ -0.61 $ 0.02 $ $ $ $ $ 0.55 $ -0.50 $ 0.25 $ -0.51 $ 0.02 $ $ $ $ $ 0.51 $ -0.58 $ 0.25 $ -0.51 $ $ 0.02 $ $ $ $ 0.55 $ -0.50 $ 0.25 $ -0.50 $ 0.25 $ 0.50 $ 0.25 $ 0.50 $ 0.25 $ 0.50 $ 0.25 $ 0.50 $ 0.25 $ 0.50 $ 0.25 $ 0.58 $ 0.25 $ -0.50 $ 0.25 $ 0.51 $ -0.58 $ 0.25 $ -0.51 $ 0.00 $ $ $ $ $ 0.51 $ -0.58 $ 0.22 $ -0.00 $ 0.25 $ -0.21 $ 0.02 $ $ $ $ 0.51 $ -0.40 $ 0.14 $ $ 0.51 $ -0.58 $ 0.22 $ -0.20 $ 0.25 $ -0.23 $ 0.00 $ $ $ 0.51 $ -0.40 $ 0.14 $ $ 0.51 $ -0.55 $ 0.50 $ 0.22 $ -0.23 $ 0.00 $ $ $ 0.51 $ -0.01 $ 0.52 $ 0.23 $ 0.00 $ $ $ 0.02 $ -0.23 $ 0.00 $ $ $ 0.51 $ -0.01 $ 0.52 $ 0.02 $ 0.03 $ 0.51 $ -0.51 $ 0.02 $ $ 0.02 $ 0.01 $ $ 0.51 $ -0.00 $ 0.52 $ 0.02 $ 0.00 $ $ 0.51 $ -0.21 $ 0.02 $ $ 0.01 $ $ 0.51 $ -0.01 $ 0.52 $ 0.22 $ -0.02 $ 0.02 $ 0.01 $ $ 0.51 $ -0.01 $ 0.52 $ 0.02 $ 0.01 $ $ 0.51 $ -0.12 $ 0.23 $ 0.00 $ $ 0.51 $ -0.25 $ 0.23 $ 0.00 $ $ 0.51 $ -0.25 $ 0.23 $ 0.00 $ $ 0.51 $ -0.25 $ 0.22 $ -0.23 $ 0.00 $ $ 0.51 $ -0.10 $ 0.52 $ 0.04 $ -0.25 $ -0.23 $ 0.00 $ $ 0.51 $ -0.10 $ 0.52 $ 0.04 $ 0.22 $ 0.00 $ $ 0.51 $ -0.10 $ 0.52 $ 0.14 $ 0.12 $ 0.01 $ 0.51 $ 0.0$						Bis(2-methoxy	(ethyl)	Ether $(1) + Not$	nane (2)						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$V^{\mathbb{E}}/(\text{cm}^{3}\cdot\text{mol}^{-1})$	298.15	4.670	0. 66 5	0.913	0.605	-0.874	0.029	$\Delta k_{o}/\mathrm{TPa}^{-1}$	298.15	102.59	-116.34	-74.30	72.81	135.40	4.039
$ \begin{array}{c} 318.15 & 5.22 & 0.640 & 0.387 & 1.170 & 0.451 & 0.033 & 318.15 & 92.08 & -124.87 & -107.21 & 106.31 & 124.87 & 2.652 \\ 308.15 & -0.360 & 0.047 & -0.174 & 0.014 & -0.108 & 0.005 & AP((cm^kmol-) & 20.15 & -1.683 & 0.228 & 0.052 & -0.064 & 0.744 & 0.017 \\ 318.15 & -0.360 & 0.032 & -0.118 & -0.068 & -0.013 & 0.021 & 0.003 & 318.15 & -1.683 & 0.218 & 0.018 & 0.518 & -0.918 & 0.552 & 0.15 \\ \Delta \mu/(m^{\bullet-1}) & 298.15 & -154.26 & -16.81 & 95.35 & 23.03 & -130.25 & 2.901 \\ 318.15 & -130.04 & -10.94 & 101.17 & 24.85 & -10.452 & 1.546 \\ & & & & & & & & & & & & & & & & & & $		308.15	5.075	0.708	0.563	0.762	0.200	0.035		308.15	89.12	-79.11	98.97	89.54	-102.43	3.476
$ \begin{array}{c} \Delta m/(mPae) & 298.15 & -0.430 & 0.047 & -0.174 & 0.014 & -0.180 & 0.005 & \Delta R/(cm^{3}m)^{-1} & 298.15 & -1.886 & 0.223 & -0.147 & 0.588 & 0.015 \\ 308.15 & -0.306 & 0.022 & -0.026 & -0.013 & -0.005 & \Delta R/(cm^{3}m)^{-1} & 298.15 & -1.866 & 0.223 & -0.044 & 0.744 & 0.017 \\ 308.15 & -130.40 & -10.94 & 10.17 & 24.85 & -10.452 & 1.546 \\ \hline & & & & & & & & & & & & & & & & & &$		318.15	5.322	0.640	0.367	1.170	0.451	0.033		318.15	92.30	-124.87	-107.21	106.31	124.87	2.652
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\Delta \eta / (mPa \cdot s)$	298.15	-0.430	0.047	-0.174	0.014	-0.150	0.005	$\Delta R/(\text{cm}^3 \cdot \text{mol}^{-1})$	298.15	-1.863	0.258	0.223	-0.147	0.538	0.013
$ \begin{array}{c} 318.15 & -0.306 & 0.322 & -0.118 & -0.008 & -0.171 & 0.003 & 318.15 & -2.073 & 0.148 & 0.518 & -0.918 & 0.852 & 0.015 \\ 308.15 & -130.67 & -1.84 & -1.623 & 64.90 & -9.81 & 2.370 \\ 318.15 & -130.00 & -1.024 & 10.17 & 24.85 & -1.0452 & 1.546 \\ \hline \\ $		308.15	-0.361	0.022	-0.126	-0.013	-0.215	0.003		308.15	-1.866	0.223	0.052	-0.064	0.744	0.017
$ \begin{array}{c} \Delta \mu/(\mathrm{m}\mathrm{s}^{-1}) & 298.15 & -168.19 & 5.63 & 23.03 & -1.93.22 & 2.901 \\ 318.15 & -136.04 & -10.44 & 101.7 & 24.85 & -104.82 & 1.546 \\ & & & & & & & & & & & & & & & & & & $		318.15	-0.306	0.032	-0.118	-0.008	-0.171	0.003		318.15	-2.073	0.148	0.518	-0.918	0.852	0.015
$ \begin{array}{c} 308.18 - 1.39.47 & -4.19 & -10.23 & 84.90 & -9.81 & 2.370 \\ 318.18 - 1.30.40 & -10.94 & 10.17 & 24.85 & -10.45 & 1.546 \\ \hline \\ $	$\Delta u/(\mathbf{m}\cdot\mathbf{s}^{-1})$	298.15	-154.26	-16.81	95.35	23.03	-130.25	2.901								
$ \begin{array}{c} 318.16 & -130.40 & -104.40 & -104.52 & 1.846 \\ & \mbox{Bi}(Cmm^4mol^{-1}) & 298.15 & 5.259 & 0.360 & 1.255 & 0.211 & -1.206 & 0.020 & \Delta k_{\nu}/TPa^{-1} & 298.15 & 137.46 & -116.90 & -130.23 & 58.22 & 281.40 & 1.314 & 0.078 & 0.081 & 5.806 & 0.290 & 0.040 & 0.040 & 0.010 & \Delta k_{\nu}/TPa^{-1} & 298.15 & 137.46 & -116.90 & -130.23 & 58.22 & 281.40 & 1.314 & 0.078 & 0.211 & 0.327 & 0.442 & 0.013 & 0.398 & -0.581 & 4.1078 & -0.583 & 4.1378 & 1.585 & 0.090 & 0.077 & -0.318 & 0.002 & 306.15 & -4.047 & 0.428 & -0.211 & 0.327 & 0.442 & 0.013 & 0.515 & -0.306 & 0.022 & -0.038 & 0.091 & -0.214 & 0.001 & 318.15 & 164.07 & 0.428 & -0.211 & 0.327 & 0.442 & 0.013 & 0.012 & 306.15 & -4.010 & 0.625 & 0.016 & 0.125 & -0.231 & 0.005 & \Delta \mu/(ms^{-1}) & 298.15 & -16.78 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 1.787 & -106.82 & 0.023 & 308.15 & 166.06 & -32.64 & 48.53 & 8.66 & -33.86 & 0.752 & -338.61 & -0.357 & -0.084 & 0.138 & -2.044 & 0.013 & \Delta \mu/TPa^{-1} & 298.15 & 164.34 & -31.30 & 17.39 & -68.15 & -7.88 & 0.655 & -7.88 & 0.655 & -1.644 & -0.138 & -0.280 & 0.033 & 306.15 & -10.198 & 3.097 & 1.772 & 0.284 & 0.642 & -2.648 & 0.738 & 0.183 & -1.67 & 0.588 & -2.64 & 4.65.5 & -6.164 & -0.286 & 0.073 & 0.289 & 0.003 & 306.15 & -10.198 & 3.097 & 1.772 & 0.296 & 0.028 & 0.024 & 0.003 & 2.29 & 0.003 & 306.15 & -10.198 & 3.097 & 1.772 & 0.296 & 0.028 & 0.024 & 0.024 & 0.024 & 0.002 & 318.15 & -0.064 & 1.986 & 0.023 & 0.003 & 306.15 & -10.198 & 3.097 & 0.151 & -0.117 & 0.008 & -0.118 & -0.117 & 0.008 & -0.078 & 0.181 & -0.026 & 0.070 & 0.280 & 0.044 & -0.286 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.668 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 & -0.688 & -0.678 &$		308.15	-139.87	-4.19	-16.23	84.90	-9.81	2.370								
$ \begin{array}{c} \text{Bis}(2-\text{methoryethy}) \text{ Ether} (1) + \text{Decane} (2) \\ V^{\#}(\text{cm}^{3}\text{-mol}^{-1}) 298.15 5.259 0.360 0.290 0.960 0.290 0.409 0.014 306.15 128.07 -59.39 4.1.24 110.79 -17.30 2.587 318.15 138.15 5.820 0.319 2.417 0.365 -2.588 0.093 318.15 183.24 -106.73 -243.98 33.78 315.87 1.953 308.15 -0.346 0.022 -0.009 0.077 -0.318 0.002 A^{\mu}/(\text{cm}^{3}\text{-mol}^{-1}) 298.15 -4.047 0.428 -0.211 0.327 0.442 0.013 308.15 -0.306 0.022 -0.009 0.077 -0.318 0.002 A^{\mu}/(\text{cm}^{3}\text{-mol}^{-1}) 298.15 -4.017 0.428 -0.211 0.327 0.442 0.013 308.15 -0.305 0.022 -0.038 0.091 -0.243 0.001 318.15 -4.010 0.825 0.103 0.192 -0.001 0.025 0.100 0.201 0.025 0.100 0.825 0.103 0.192 -0.021 0.005 0.021 -0.038 0.091 -0.243 0.001 318.15 -4.010 0.825 0.046 -0.125 -0.231 0.005 0.021 -0.38 0.301 5 -140.04 2.498 37.30 84.45 -113.71 1.633 318.15 -159.79 37.63 110.32 -64.99 -106.82 1.787 \\ \textbf{Bis}(2-\text{methoryethy}) \text{ Ether} (1) + \text{Dodecane} (2) \\ V^{\#}/(\text{cm}^{3}\text{-mol}^{-1}) 298.15 5.538 0.277 0.654 1.605 -1.664 0.013 0.4\mu/TPa^{-1} 298.15 144.34 -31.30 17.39 -68.15 -7.85 0.639 308.15 5.812 -0.055 1.036 1.698 -2.044 0.033 0.021 318.15 16.06 -3.264 4.8.83 8.66 -3.36.80 0.752 318.15 16.068 3.090 1.271 1.409 -2.045 0.023 318.15 16.406 -3.264 4.8.83 8.66 -3.36.80 0.752 318.15 5.812 -0.057 -0.089 -0.280 0.003 0.289 0.003 0.306.15 -0.186 -0.277 0.184 0.842 0.012 318.15 10.408 -0.387 -0.089 -0.280 0.003 0.290 0.003 0.306.15 -0.386 0.195 0.717.2 -0.796 1.695 0.023 318.15 -0.286 0.070 -0.252 0.044 0.234 0.002 318.15 1-0.046 1.948 -0.397 0.151 -0.117 0.008 0.007 (-1.98.15 -0.387 -0.089 -0.280 0.070 0.328 0.003 0.306.15 -1.036 -0.287 0.014 0.234 0.002 318.15 1-0.046 1.948 -0.397 0.151 -0.117 0.008 0.007 (-1.98.15 19.360 -0.287 0.036 0.195 0.717.1 0.197 318.15 -0.286 -0.070 -0.252 0.044 0.023 0.038 318.15 -0.865 5.1.99 0.038 0.195 1.77.71 0.197 318.15 -0.145 0.198 0.097 0.33 0.146 0.389 0.036 0.195 0.777 0.146 0.499 0.018 0.035 0.198 0.777 0.447 0.587 0.029 318.15 17.36 -46.82 -24.05 19.37 0.158 0.035 0.035 0.036 0.035 0.0.36 0.195 0.777 0.138 0.330.15 -0$		318.15	-130.40	-10.94	101.17	24.85	-104.52	1.546								
$ \frac{\sqrt{2}}{(\text{cm}^{3}\text{-mol}^{-1})} \frac{298.15}{9.815} 5.289 0.3800 1.225 0.211 -1.206 0.020 0.267 //1Pe^{-1} 298.15 137.46 -118.90 -130.23 68.22 29.140 1.314 0.265 (1.407 0.425 -10.63 0.090 0.960 0.290 0.0014 308.15 181.24 -10.67.3 -243.98 33.78 315.87 1.953 (1.407 0.425 0.013 0.015 0.022 -0.009 0.077 -0.318 0.002 0.267 (1.407 0.425 -0.211 0.327 0.442 0.013 308.15 -0.366 0.022 -0.009 0.077 -0.318 0.002 0.308.15 -4.001 0.625 0.103 0.192 -0.001 0.025 318.15 -0.306 0.022 -0.009 0.077 -0.318 0.002 0.308.15 -4.001 0.625 0.103 0.192 -0.001 0.025 318.15 -0.306 0.022 -0.038 0.091 -0.243 0.001 318.15 -4.010 0.820 0.046 -0.125 -0.231 0.005 0.021 -0.038 0.091 -0.243 0.001 318.15 -4.010 0.820 0.046 -0.125 -0.231 0.005 0.021 -0.028 308.15 -140.64 2.498 37.30 84.45 -113.71 1.633 318.15 -4.010 0.820 0.046 -0.125 -0.231 0.005 0.014 308.15 1.54.07 37.63 11.032 -64.09 -106.82 1.787 1.833 318.15 -14.044 2.498 37.30 84.45 -113.71 1.633 318.15 -14.044 2.498 37.30 84.45 -113.71 1.633 318.15 1.428 -40.82 58.49 -76.14 -78.36 0.655 0.308 0.277 0.654 0.030 0.294 (1.013 0.44 //TPa^{-1} 298.15 1.44.34 -31.30 17.39 -68.15 -7.85 0.639 308.15 5.812 -0.055 1.036 1.696 -0.204 0.014 308.18 15.14.28 -40.82 58.49 -7.614 -78.36 0.655 0.318 0.577 0.654 0.033 0.264 0.002 318.15 17.428 -40.82 58.49 -7.614 -78.36 0.655 318.15 -0.387 0.098 -0.248 0.073 0.239 0.003 308.15 -0.139 0.097 1.772 -0.796 1.695 0.023 318.15 -0.266 -0.070 -0.252 0.044 0.024 0.002 318.15 17.36 -46.82 -24.05 19.37 0.151 -0.117 0.008 308.15 -0.387 0.098 -0.268 0.073 0.239 0.003 308.15 -10.199 3.097 1.772 -0.796 1.695 0.023 318.15 -13.40 0.42.2 -38.33 4.9.37 -167 0.538 318.15 -10.346 0.194 0.242 -38.33 4.9.37 -167 0.538 318.15 -13.40 0.42.2 -38.33 4.9.37 -167 0.538 318.15 -13.40 0.42.2 -38.3 4.9.37 -167 0.538 318.15 -13.40 0.42.2 -38.3 4.9.37 -167 0.538 318.15 -13.40 0.42.2 -38.3 4.9.37 -167 0.538 318.15 -13.40 0.42.2 -38.3 4.9.37 -16.5 0.590 0.036 0.003 0.016 1.73.6 0.51 -0.017 0.038 0.035 0.026 0.010 318.15 -0.027 0.388 -0.277 0.388 0.033 0.033 0.035 1.78.2 -51.99 0.036 61.95 0.030$						Bis(2-methox	yethyl)	Ether $(1) + De$	cane (2)						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$V^{\mathbf{E}}/(\mathbf{cm}^{\mathbf{s}}\cdot\mathbf{mol}^{-1})$	298.15	5.259	0.360	1.255	0.211	-1.206	0.020	$\Delta k_{\rm s}/{\rm TPa^{-1}}$	298.15	137.46	-116.90	-130.23	58.22	281.40	1.314
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		308.15	5.605	0.290	0.960	0.290	-0.409	0.014		308.15	128.07	-59.39	41.24	110.79	-17.30	2.587
$ \begin{array}{c} \Delta \eta/(m^2 e_1) & 298.15 & -0.440 & 0.020 & -0.075 & 0.121 & -0.316 & 0.002 & 308.15 & -4.047 & 0.428 & -0.211 & 0.327 & 0.442 & 0.013 \\ 308.15 & -0.366 & 0.022 & -0.069 & 0.077 & -0.318 & 0.002 & 308.15 & -4.001 & 0.625 & 0.103 & 0.192 & -0.010 & 0.025 \\ 318.15 & -10.366 & 0.022 & -0.038 & 0.091 & -0.243 & 0.001 & 318.15 & -4.001 & 0.620 & 0.046 & -0.125 & -0.231 & 0.005 \\ \Delta \mu/(m^-s^-) & 298.15 & -16.167 & -0.78 & 101.73 & -10.04 & -174.15 & 1.648 \\ 308.15 & -149.64 & 24.98 & 37.30 & 84.45 & -113.71 & 1.633 \\ 318.15 & -159.79 & 37.63 & 110.32 & -64.99 & -106.82 & 1.787 \\ & & & & & & & & & & & & & & & & & & $		318.15	5.620	0.319	2.417	0.265	-2.583	0.039		318.15	181.24	-106.73	-243.98	33.78	315.87	1.953
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\Delta \eta / (m Pa \cdot s)$	298.15	-0.440	0.020	-0.075	0.121	-0.315	0.002	$\Delta R/(\text{cm}^{\circ}\text{mol}^{-1})$	298.15	-4.047	0.428	-0.211	0.327	0.442	0.013
$ \begin{array}{c} \Delta \mu/(\mathrm{m}\mathrm{e}^{-1}) & 298.15 & -16.157 & -0.78 & 10.173 & -10.04 & -174.15 & 1.648 \\ \Delta \mu/(\mathrm{m}\mathrm{e}^{-1}) & 298.15 & -16.157 & -0.78 & 10.137 & -10.04 & -174.15 & 1.648 \\ 308.15 & -169.79 & 37.63 & 110.32 & -64.99 & -106.82 & 1.787 \\ & & & & & & & & & & & & & & & & & & $		308.15	-0.368	0.022	-0.009	0.077	-0.318	0.002		308.15	-4.001	0.625	0.103	0.192	-0.001	0.025
$ \begin{split} \Delta \mu/(\mathrm{m}\mathrm{s}^{-1}) & 298.15 & -161.57 & -0.78 & 101.73 & -10.04 & -174.15 & 1.648 \\ 308.15 & -140.64 & 24.98 & 37.30 & 34.45 & -113.71 & 1.633 \\ 318.15 & -159.79 & 37.63 & 110.32 & -64.99 & -106.82 & 1.787 \\ & & & & & & & & & & & & & & & & & & $		318.15	-0.305	0.022	-0.038	0.091	-0.243	0.001		318.15	-4.010	0.820	0.046	-0.125	-0.231	0.005
$ \begin{array}{c} 336.15 & -149.64 & 24.96 & 37.30 & 84.49 & -118.11 & 1633 \\ 318.15 & -159.79 & 37.63 & 110.32 & -64.99 & -106.82 & 1.787 \\ & & & & & & & & & & & & & & & & & & $	$\Delta u/(m \cdot s^{-1})$	298.15	-161.57	-0.78	101.73	-10.04	-174.15	1.648								
$ \begin{array}{c} 318.15 & -1.09.19 & 37.63 & 110.32 & -64.39 & -106.82 & 1.787 \\ & \mbox{Bis}(2-methoxysthyl) Ether (1) + Dodecane (2) \\ V^g/(cm^3-mol^{-1}) 298.15 & 5.538 & 0.277 & 0.654 & 1.606 & -1.664 & 0.013 & \Delta k_g/TPa^{-1} & 298.15 & 144.34 & -31.30 & 17.39 & -68.15 & -7.85 & 0.639 \\ 308.15 & 5.812 & -0.055 & 1.036 & 1.698 & -2.034 & 0.014 & 308.15 & 156.06 & -32.64 & 48.53 & 8.66 & -33.68 & 0.752 \\ 318.15 & 0.088 & 0.090 & 1.271 & 1.409 & -2.045 & 0.023 & 318.15 & 174.28 & -40.82 & 68.49 & -7.61 & -78.86 & 0.655 \\ \Delta \eta/(mPa \cdot s) & 298.15 & -0.449 & -0.163 & -0.349 & 0.133 & 0.264 & 0.003 & \Delta R/(cm^3-mol^{-1}) 298.15 & -0.896 & 1.936 & -0.273 & 0.184 & 0.842 & 0.012 \\ 308.15 & -0.326 & -0.070 & -0.252 & 0.044 & 0.234 & 0.002 & 318.15 & -10.199 & 3.097 & 1.772 & -0.766 & 1.695 & 0.023 \\ \Delta \mu/(me^{-1}) & 298.15 & -133.92 & 45.78 & -53.96 & -20.70 & 44.76 & 0.568 \\ \Delta \mu/(me^{-1}) & 298.15 & 5.037 & -1.345 & -1.152 & 2.831 & 1.186 & 0.019 & \Delta k_g/TPa^{-1} & 298.15 & 157.36 & -46.82 & -24.05 & 19.37 & 105.95 & 0.525 \\ 308.15 & -0.826 & -0.077 & -0.353 & 1.467 & 0.587 & 0.029 & 318.15 & 190.60 & -86.55 & -51.99 & 73.39 & 103.20 & 1.393 \\ 308.15 & -0.465 & -0.149 & -2.149 & 1.412 & 2.057 & 0.095 & 308.15 & 178.20 & -51.90 & 0.03 & 61.95 & 177.71 & 1.197 \\ 318.15 & 6.170 & -0.807 & -0.353 & 1.467 & 0.587 & 0.029 & 318.15 & 190.60 & -86.55 & -51.99 & 70.39 & 0.035 \\ 308.15 & -0.465 & -0.149 & -0.171 & -0.063 & -0.006 & 0.004 & 308.15 & -18.750 & 5.240 & -1.015 & 0.396 & -0.639 & 0.030 \\ 318.15 & -0.465 & -0.149 & -0.171 & -0.063 & -0.006 & 0.004 & 308.15 & -18.750 & 5.240 & -1.015 & 0.396 & -0.639 & 0.030 \\ 308.15 & -1.086 & -0.616 & -0.144 & 0.109 & 0.077 & 0.003 & 318.15 & -18.697 & 5.379 & -0.772 & 3.608 & 1.796 & 0.014 \\ \Delta \mu/(me^{-1}) & 298.15 & -10.83 & -0.547 & 1.58 & -0.277 & -3.642 & -2.643 & 0.025 & 308.15 & 166.28 & -25.21 & 27.89 & -9.18 & 113.89 & 1.141 \\ 308.15 & 6.464 & -0.941 & 0.832 & 4.744 & 1.245 & 0.036 & 318.15 & 193.11 & -52.32 & 28.43 & 31.37 & -64.54 & 1.240 \\ \Delta \eta/(mPe^{-1}) & 298.15 & -1.083 & -0.567 $		308.15	-149.64	24.98	37.30	84.40	-113.71	1.633								
$\begin{split} & \text{Bis}(2\text{-meth}\text{trythy}) \ \text{Ether} (1) + \ \text{Dolecane} (2) \\ V^{\text{P}}((\text{cm}^{3}\text{mo} ^{-1}) \ 298.15 \ 5.538 \ 0.277 \ 0.654 \ 1.605 \ -1.664 \ 0.013 \ \Delta k_{r}/\text{TPa}^{-1} \ 298.15 \ 144.34 \ -31.30 \ 17.39 \ -68.15 \ -7.85 \ 0.639 \ 0.752 \\ & 318.15 \ 0.488 \ 0.090 \ 1.271 \ 1.409 \ -2.045 \ 0.023 \ 318.15 \ 174.28 \ -40.82 \ 58.49 \ -76.14 \ -78.36 \ 0.655 \ 0.762 \ 318.15 \ 0.49 \ -0.49 \ -0.163 \ -0.349 \ 0.133 \ 0.264 \ 0.003 \ \Delta R/(\text{cm}^{3}\text{-mo} ^{-1}) \ 298.15 \ -0.866 \ 1.936 \ -0.273 \ 0.184 \ 0.422 \ 0.023 \ 308.15 \ -10.199 \ 3.097 \ 1.772 \ -0.796 \ 1.695 \ 0.023 \ 308.15 \ -10.199 \ 3.097 \ 1.772 \ -0.796 \ 1.695 \ 0.023 \ 308.15 \ -10.199 \ 3.097 \ 1.772 \ -0.796 \ 1.695 \ 0.023 \ 308.15 \ -10.46 \ 1.948 \ -0.397 \ 0.151 \ -0.117 \ 0.008 \ \Delta \mu/(\text{m}\cdot\text{s}^{-1}) \ 298.15 \ -0.266 \ -0.070 \ -0.252 \ 0.044 \ 0.234 \ 0.002 \ 318.15 \ -10.046 \ 1.948 \ -0.397 \ 0.151 \ -0.117 \ 0.088 \ 318.15 \ -126.76 \ 36.25 \ -51.69 \ -6.55 \ 51.39 \ 0.646 \ -56.8 \ -56.9 \ -77.71 \ 1.97 \ 1.97 \ 1.98 \ -56.9 \ -56.9 \ -56.9 \ -56.9 \ -56.9 \ -56.9 \ -7.86 \ -56.9 \ -7.86 \ -56.9 \ -7.86 \ -7.86 \ -56.9 \ -7.86 \ -7.8$		318.15	-159.79	37.63	110.32	-64.99	-106.82	1.787								
$ \begin{tabular}{ c cm^3mol^{-1}$) $ 298.15 & 5.838 0.277 & 0.654 & 1.605 & -1.664 & 0.013 $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $$						Bis(2	-methoxy	ethyl)	Ether $(1) + Dod$	ecane (2)					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$V^{\mathbf{E}}/(\mathbf{cm^{3}\cdot mol^{-1}})$	298.15	5.538	0.277	0.654	1.605	-1.664	0.013	$\Delta k_{o}/TPa^{-1}$	298.15	144.34	-31.30	17.39	-68.15	-7.85	0.639
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		308.15	5.812	-0.055	1.036	1.698	-2.034	0.014		308.15	156.06	-32.64	48.53	8.66	-33.68	0.752
$ \Delta \eta/(mPars) 298.15 - 0.449 - 0.163 - 0.349 0.133 0.264 0.003 AP/(cm^3mol^-) 298.15 - 9.896 1.936 - 0.273 0.184 0.842 0.012 308.15 - 0.367 - 0.098 - 0.268 0.073 0.239 0.003 308.15 - 10.199 3.097 1.772 - 0.796 1.695 0.023 318.15 - 0.286 -0.070 - 0.252 0.044 0.234 0.002 318.15 - 10.046 1.948 - 0.397 0.151 - 0.117 0.008 \\ \Delta \mu/(me^{-1}) 298.15 - 133.92 45.78 - 53.96 - 20.70 44.76 0.588 308.15 - 10.046 1.948 - 0.397 0.151 - 0.117 0.008 308.15 - 134.00 42.42 - 38.33 49.37 - 1.67 0.538 318.15 - 10.46 1.948 - 0.397 0.151 - 0.117 0.008 \\ \mathbf{M}^{\mathbf{V}}(\mathbf{cm^3}\cdot\mathbf{mol^{-1}}) 298.15 5.507 - 1.345 - 1.152 2.831 1.186 0.019 \Delta k_{\mu}/TPa^{-1} 298.15 157.36 - 46.82 - 24.05 19.37 105.95 0.525 308.15 130.15 - 0.087 - 0.353 1.467 0.587 0.229 318.15 190.60 - 68.55 - 51.99 7.3.39 103.20 1.393 308.15 - 0.827 - 0.363 1.467 0.587 0.229 318.15 190.60 - 68.55 - 51.99 7.3.39 103.20 1.393 \\ \Delta \eta/(mPa^{-1}) 298.15 - 0.622 - 0.288 - 0.277 0.036 0.035 0.003 \Delta R/(cm^3\cdot\mathbf{mol^{-1}}) 298.15 - 18.503 5.212 - 1.946 0.146 0.599 0.018 308.15 - 0.465 - 0.144 0.109 0.077 0.003 318.15 - 18.503 5.212 - 1.946 0.146 0.599 0.018 308.15 - 0.465 - 0.144 0.109 0.077 0.003 318.15 - 18.697 5.379 - 0.772 3.608 1.796 0.014 \\ \Delta \mu/(\mathbf{m}\cdot\mathbf{s}^{-1}) 298.15 - 120.65 45.95 - 9.22 14.68 - 62.47 0.534 308.15 - 18.697 5.379 - 0.772 3.608 1.796 0.014 \\ \Delta \mu/(\mathbf{m}\cdot\mathbf{s}^{-1}) 298.15 - 120.65 45.95 - 9.22 14.68 - 62.47 0.534 \\ 308.15 - 0.184 0.018 0.077 0.003 318.15 - 18.697 5.379 - 0.772 3.608 1.796 0.014 \\ \Delta \mu/(\mathbf{m}\cdot\mathbf{s}^{-1}) 298.15 - 6.014 1.518 1.964 - 2.663 0.025 308.15 187.37 - 23.22 - 54.30 13.65 21.28 1.695 318.15 - 10.83 - 0.549 0.06 0.011 - 0.738 0.012 \Delta R/(cm^3\cdot\mathbf{mol^{-1}}) 298.15 - 120.85 43.95 - 1.424 0.321 - 0.331 1.5 - 1.6.44 9.620 - 2.932 1.442 - 1.847 0.031 318.15 - 1.8.64 9.529 0.508 318.15 - 1.8.63 - 0.549 0.006 0.011 - 0.738 0.012 \Delta R/(cm^3\cdot\mathbf{mol^{-1}}) 298.15 - 25.21 27.89 - 9.18 113.89 1.141 308.15 - 0.555 - 0.366 - 0.550 - 0.004 0.025 308.15 187.37 - 23.22 - 54.30 13.65 21.28 1.695 318.15 - 1.083 - 0.549 0.006 0.011 - 0.738 0.012 \Delta R/(cm^3\cdot\mathbf{mol^{-1}}) 298$		318.15	6.088	0.090	1.271	1.409	-2.045	0.023		318.15	174.28	-40.82	58.49	-76.14	-78.36	0.655
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\Delta \eta / (mPa \cdot s)$	298.15	-0.449	-0.163	-0.349	0.133	0.264	0.003	$\Delta R/(cm^{3}mol^{-1})$	298.15	-9.896	1.936	-0.273	0.184	0.842	0.012
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		308.15	-0.357	-0.098	-0.268	0.073	0.239	0.003		308.15	-10.199	3.097	1.772	-0.796	1.695	0.023
$ \begin{array}{c} \Delta \mu/(\mathrm{m}\mathrm{s}^{\mathrm{n}-1}) & 298.15 & -133.92 & 45.78 & -53.96 & -20.70 & 44.76 & 0.588 \\ & 308.15 & -134.00 & 42.42 & -38.33 & 49.37 & -1.67 & 0.538 \\ & 318.15 & -128.76 & 36.25 & -51.65 & -6.05 & 51.39 & 0.646 \\ & & & & & & & & & & & & & & & & & & $	A 14 15	318.15	-0.286	-0.070	-0.252	0.044	0.234	0.002		318.15	-10.046	1.948	-0.397	0.151	-0.117	0.008
$\begin{array}{c} 308.15 & -104.00 & 42.42 & -38.33 & 49.37 & -1.67 & 0.538 \\ 318.15 & -104.00 & 42.42 & -38.33 & 49.37 & -1.67 & 0.538 \\ 318.15 & -105.76 & -6.05 & -6.05 & -6.05 & -6.05 & -6.05 \\ \hline & & & & & & & & & & & & & & & & & &$	$\Delta u/(\mathbf{m}\cdot\mathbf{s}^{-1})$	298.10	-133.92	40.78	-03.96	-20.70	44.76	0.068								
$ \begin{array}{c} 316.15 \ -120.16 \ 36.25 \ -0.163 \ -0.03 \ -0.03 \ -0.046 \\ & \ Bis(2-methoxyethyl) \ Ether (1) \ + \ Tetradecane (2) \\ V^{E}/(cm^{3}\cdot mol^{-1}) \ 298.15 \ 5.507 \ -1.345 \ -1.152 \ 2.831 \ 1.186 \ 0.019 \ \Delta k_{y}/\mathrm{TPa^{-1}} \ 298.15 \ 157.36 \ -46.82 \ -24.05 \ 19.37 \ 105.95 \ 0.525 \ 308.15 \ 5.392 \ -1.149 \ -2.149 \ 1.412 \ 2.057 \ 0.095 \ 308.15 \ 178.20 \ -51.90 \ 0.03 \ 61.95 \ 177.71 \ 1.197 \ 318.15 \ 6.170 \ -0.807 \ -0.353 \ 1.467 \ 0.587 \ 0.029 \ 318.15 \ 190.60 \ -86.55 \ -51.99 \ 73.39 \ 103.20 \ 1.393 \ \Delta \eta/(m^{Pa\cdots}) \ 298.15 \ -0.622 \ -0.288 \ -0.277 \ 0.036 \ 0.035 \ 0.003 \ \Delta R/(cm^{3}\cdot mol^{-1}) \ 298.15 \ -18.503 \ 5.212 \ -1.946 \ 0.146 \ 0.599 \ 0.018 \ 308.15 \ -0.369 \ -0.149 \ -0.171 \ -0.063 \ -0.006 \ 0.004 \ 308.15 \ -18.750 \ 5.240 \ -1.015 \ 0.396 \ -0.639 \ 0.030 \ 318.15 \ -10.869 \ -0.165 \ -0.144 \ 0.109 \ 0.077 \ 0.003 \ 318.15 \ -18.697 \ 5.379 \ -0.772 \ 3.608 \ 1.796 \ 0.014 \ \Delta u/(m\cdots^{-1}) \ 298.15 \ -120.65 \ 45.95 \ -9.22 \ 14.68 \ -62.47 \ 0.534 \ 308.15 \ -18.697 \ 5.379 \ -0.772 \ 3.608 \ 1.796 \ 0.014 \ \Delta u/(m\cdots^{-1}) \ 298.15 \ -120.55 \ 45.95 \ -9.22 \ 14.68 \ -62.47 \ 0.534 \ 308.15 \ -18.697 \ 5.379 \ -0.772 \ 3.608 \ 1.796 \ 0.014 \ \Delta u/(m\cdots^{-1}) \ 298.15 \ -10.628 \ -25.21 \ 27.89 \ -9.18 \ 13.89 \ 1.411 \ 3.69 \ 1.223 \ -120.55 \ 318.15 \ -115.48 \ 42.90 \ 19.39 \ 5.07 \ -36.35 \ 1.223 \ -120.55 \ -30.55 \ -30.525 \ -30.55 \ -$		010.10	-134.00	42.42 92.95	-30.33 E1 65	49.37	-1.0/ E1 90	0.038								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		316.15	-120.70	30.20	-01.00	-0.05	01.09	0.040		_						
$ \sqrt{2}/(\text{cm}^3 \text{mol}^{-1}) 298.15 - 5.07/-1.345 - 1.152 - 2.831 - 1.186 - 0.019 \Delta R_{*}/1Pa^{-1} - 298.15 - 157.36 - 46.82 - 24.05 - 19.37 - 105.95 - 0.525 - 308.15 - 5.932 - 1.149 - 2.149 - 1.412 - 2.057 - 0.095 - 308.15 - 178.20 - 51.90 - 0.03 - 61.95 - 177.71 - 1.197 - 318.15 - 6.170 - 0.607 - 0.353 - 1.467 - 0.587 - 0.029 - 318.15 - 18.503 - 5.212 - 1.946 - 0.146 - 0.599 - 0.018 - 308.15 - 0.465 - 0.149 - 0.171 - 0.063 - 0.006 - 0.004 - 308.15 - 18.503 - 5.212 - 1.946 - 0.146 - 0.599 - 0.018 - 308.15 - 0.369 - 0.165 - 0.144 - 0.109 - 0.077 - 0.003 - 318.15 - 18.503 - 5.240 - 1.015 - 0.3960.639 - 0.030 - 318.15 - 0.369 - 0.165 - 0.144 - 0.109 - 0.077 - 0.003 - 318.15 - 18.697 - 5.379 - 0.772 - 3.608 - 1.796 - 0.014 - 2.017 - 308.15 - 128.22 - 36.47 - 1.787 - 54.13 - 184.56 - 0.527 - 318.15 - 115.48 - 42.90 - 19.39 - 5.07 - 36.35 - 1.223 - 308.15 - 128.22 - 36.47 - 1.787 - 54.13 - 184.56 - 0.527 - 318.15 - 115.48 - 42.90 - 19.39 - 5.07 - 36.35 - 1.223 - 308.15 - 187.37 - 23.22 - 54.30 - 13.65 - 21.28 - 1.695 - 318.15 - 6.644 - 0.941 - 0.832 - 4.744 - 2.663 - 0.025 - 308.15 - 187.37 - 23.22 - 54.30 - 13.65 - 21.28 - 1.695 - 318.15 - 6.644 - 0.941 - 0.832 - 4.744 - 2.663 - 0.025 - 308.15 - 19.311 - 52.32 - 23.83 - 31.37 - 64.54 - 1.240 - 2.407 - 0.034 - 2.667 - 0.034 - 0.507 - 0.004 - 308.15 - 28.573 - 10.290 - 6.250 - 0.801 - 3.355 - 0.034 - 0.507 - 0.004 - 308.15 - 28.573 - 10.544 - 3.926 - 1.099 - 0.767 - 0.047 - 2.407 - 1.298.15 - 0.555 - 0.366 - 0.550 - 0.120 - 0.125 - 0.003 - 318.15 - 28.573 - 10.544 - 3.926 - 1.099 - 0.767 - 0.047 - 2.407 - 1.298.15 - 0.773 - 0.416 - 0.027 - 0.034 - 0.507 - 0.004 - 308.15 - 28.573 - 10.544 - 3.926 - 1.099 - 0.767 - 0.047 - 308.15 - 0.773 - 0.416 - 0.027 - 0.034 - 0.507 - 0.004 - 308.15 - 28.573 - 10.544 - 3.926 - 1.099 - 0.767 - 0.047 - 308.15 - 0.773 - 0.416 - 0.027 - 0.034 - 0.507 - 0.004 - 308.15 - 28.573 - 10.544 - 3.926 - 1.099 - 0.767 - 0.047 - 308.15 - 0.907 - 9.837 - 10.11 - 2.093 - 68.71 - 1.067 - 0.027 - 0.077 - 0.047 - 0.012 - 0.0125 - 0.003 - 0.507 - 0$	T712//	000 1 5		1.045	1 1 50	Bis(2-n	nethoxyet	hyl) E	ther $(1) + Tetra$	decane	(2)	40.00	04.05	10.05	105.05	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	V =/(cm••mol-1)	298.15	5.507	-1.345	-1.152	2.831	1.186	0.019	$\Delta R_{0}/TPa^{-1}$	298.15	157.36	-46.82	-24.05	19.37	105.95	0.525
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		308.15	0.932	-1.149	-2.149	1.412	2.057	0.095		308.15	178.20	-51.90	0.03	61.95	100.00	1.197
$ \begin{split} \Delta\eta/(\mathrm{Im}\mathrm{Pa}\mathrm{s}) & 298.15 & -0.822 & -0.288 & -0.217 & 0.036 & 0.003 & 0.003 & 0.003 & 0.004 & 308.15 & -18.503 & 5.212 & -1.946 & 0.146 & 0.599 & 0.018 \\ 308.15 & -0.465 & -0.149 & -0.171 & -0.063 & -0.006 & 0.004 & 308.15 & -18.503 & 5.212 & -1.946 & 0.146 & 0.599 & 0.018 \\ 308.15 & -0.369 & -0.165 & -0.149 & -0.171 & -0.063 & -0.006 & 0.004 & 308.15 & -18.503 & 5.212 & -1.946 & 0.146 & 0.599 & 0.030 \\ 318.15 & -0.369 & -0.165 & -0.144 & 0.109 & 0.077 & 0.003 & 318.15 & -18.697 & 5.379 & -0.772 & 3.608 & 1.796 & 0.014 \\ \Delta u/(\mathrm{m}\mathrm{s}^{-1}) & 298.15 & -128.22 & 36.47 & 17.87 & 54.13 & -184.56 & 0.527 \\ & & & & & & & & & & & & & & & & & & $	• //	318.10	6.170	-0.807	-0.353	1.40/	0.007	0.029	A D / / 91 1)	318.10	190.60	-60.00	-01.99	73.39	103.20	1.393
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\Delta \eta / (m P a \cdot s)$	298.10	-0.022	-0.200	-0.277	0.030	0.030	0.003	$\Delta \pi / (cm^{-1})$	298.10	10 750	5.212	-1.940	0.140	0.099	0.018
$ \begin{array}{c} 318.15 & -0.365 & -0.165 & -0.144 & 0.105 & -0.077 & 0.003 & 318.15 & -18.697 & 5.378 & -0.772 & 5.068 & 1.798 & 0.014 \\ 308.15 & -128.22 & 36.47 & 17.87 & 54.13 & -184.56 & 0.527 \\ 318.15 & -115.48 & 42.90 & 19.39 & 5.07 & -36.35 & 1.223 \\ \hline \\ V^{E}/(cm^3 \cdot mol^{-1}) & 298.15 & 6.103 & -0.118 & 1.579 & 1.572 & -2.846 & 0.046 & \Delta k_{*}/TPa^{-1} & 298.15 & 156.28 & -25.21 & 27.89 & -9.18 & 113.89 & 1.141 \\ 308.15 & 6.364 & -0.610 & 1.518 & 1.964 & -2.663 & 0.025 & 308.15 & 187.37 & -23.22 & -54.30 & 13.65 & 21.28 & 1.695 \\ 318.15 & 6.644 & -0.941 & 0.832 & 4.744 & 1.245 & 0.036 & 318.15 & 193.11 & -52.32 & 23.83 & -31.37 & -64.54 & 1.240 \\ \Delta \eta/(mPa \cdot s) & 298.15 & -1.083 & -0.549 & 0.006 & 0.011 & -0.738 & 0.012 & \Delta R/(cm^3 \cdot mol^{-1}) & 298.15 & -28.644 & 9.620 & -2.932 & 1.442 & -1.847 & 0.031 \\ 308.15 & -0.773 & -0.416 & -0.027 & 0.034 & -0.507 & 0.004 & 308.15 & -28.359 & 10.290 & -6.250 & 0.801 & 3.355 & 0.081 \\ 318.15 & -0.555 & -0.366 & -0.550 & -0.120 & 0.125 & 0.003 & 318.15 & -28.573 & 10.544 & -3.926 & -1.099 & -0.767 & 0.047 \\ \Delta u/(m \cdot s^{-1}) & 298.15 & -99.07 & 98.37 & 10.11 & -20.93 & -68.71 & 1.067 \\ \end{array}$		010.10	-0.400	-0.149	-0.171	-0.003	-0.000	0.004		308.10	19 607	5.240	-1.015	0.390	-0.039	0.030
$ \begin{array}{c} \Delta u/(\mathrm{ms}^{-1}) & 256.15 & -120.05 & 40.53 & -52.2 & 14.05 & -02.14 & 0.334 \\ & 308.15 & -128.22 & 36.47 & 17.87 & 54.13 & -184.56 & 0.527 \\ & 318.15 & -115.48 & 42.90 & 19.39 & 5.07 & -36.35 & 1.223 \\ & & & & & & \\ & & & & & \\ & & & & & $	A / (000 15	-190.65	45.05	-0.144	14 69	-69.47	0.003		316.10	-10.091	0.019	-0.772	3.000	1.790	0.014
$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\Delta u/(\text{m/s}^{-})$	200.10	-120.00	96 47	17 97	54 19	-184 56	0.004								
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		218 15	-115 / 8	12 00	10.30	5.07	-36 35	1 993								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		310.15	-110.40	42.50	19.09	0.07	-30.35	1.220			-					
$ \begin{array}{c} \sqrt{2}/(\mathrm{cm^{3}mol^{-1}}) \begin{array}{c} 298.15 & 6.103 \\ 308.15 & 6.364 \\ -0.610 & 1.518 \\ 1.964 \\ -0.610 & 1.518 \\ 1.964 \\ -2.663 \\ 0.025 \\ 318.15 \\ -0.73 \\ 318.15 \\ -0.815 \\ -1.083 \\ -0.549 \\ 0.006 \\ 0.011 \\ -0.73 \\ 0.044 \\ -0.650 \\ -0.77 \\ -0.416 \\ -0.027 \\ 0.034 \\ -0.555 \\ -0.366 \\ -0.550 \\ -0.120 \\ 0.125 \\ 0.003 \\ -0.77 \\ 0.041 \\ -0.78 \\ 0.012 \\ \Delta R_{/}(\mathrm{rm^{3}\cdot mol^{-1}}) \begin{array}{c} 298.15 \\ 187.37 \\ -23.22 \\ -2.32 \\ -2.32 \\ -2.32 \\ -2.32 \\ -2.33 \\ -31.37 \\ -64.54 \\ 1.240 \\ -2.32 \\ 1.442 \\ -1.847 \\ 0.031 \\ -0.77 \\ -0.416 \\ -0.027 \\ 0.034 \\ -0.557 \\ -0.555 \\ -0.366 \\ -0.550 \\ -0.120 \\ 0.125 \\ 0.003 \\ -147.18 \\ 0.537 \\ -0.77 \\ -0.57 \\ -0.77 \\ -0.77 \\ -0.77 \\ -0.767 \\ 0.047 \\ -0.767 \\ -0.7$	17E//	000 15	0 100	0 1 1 0	1 570	Bis(2-r	nethoxyet	hyl) E	ther $(1) + Hexad$	decane (2)	05 01	07.00	0.10	110.00	1 1 4 1
$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	V =/(cm ³ ·mol ⁻¹)	298.15	6.103	-0.118	1.579	1.572	-2.846	0.046	$\Delta R_{\rm s}/11{\rm Pa}^{-1}$	298.15	105.28	-25.21	27.89	-9.18	113.89	1.141
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		308.15	0.304	-0.610	1.519	1.904	-2.003	0.025		308.15	187.37	-23.22	-54.30	13.65	21.28	1.695
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	A /(m B= -)	010.10	0.044	-0.941	0.832	4.744	1.245	0.030	A D / (am 3 1-1)	010.10	199.11	-52.32	20.00	-01.37	-04.04	1.240
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Δη/(mr'a•s)	290.10	-1.083	-0.049	0.000	0.011	-0.738	0.012	Δπ/(cm ^{ss} mol ⁻¹)	290.10	-20.044	9.620	-2.932	1.442	-1.847	0.031
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		000.10 910 15	-0.113	-0.410	-0.027	_0.034	-0.007	0.004		010.10	-20.009	10.290	-0.200	0.001	0.000	0.001
$\frac{\Delta u}{(11.5^{-7})} = \frac{250.10}{308.15} = \frac{51.22}{99.07} = \frac{50.50}{10.11} = \frac{147.16}{-20.93} = \frac{68.71}{1.067} = \frac{10.42}{-10.11} = \frac{10.42}{-10.42} = \frac{10.42}{$	$\Delta u / (m - 1)$	010.10 010.10	-0.000		-16 49	40.55	-147 19	0.003		919.19	-20.0/3	10.044	-3.926	-1.099	-0.767	0.047
	Δu/(III's -)	200.10	_00.07	00.00	10.42	-20.00	_69 71	1 067								
318 15 -93 09 47 41 -17 17 13 93 12 54 0 906		318 15	-93.09	47 41	-17 17	13.93	12.54	0.906								

Table 3. Estimated Parameters of Excess Functions for Mixtures

experimental values have been estimated by using

$$\sigma(\Delta Y \text{ or } V^{\mathbf{E}}) = \left[\sum_{i=1}^{m} \{(\Delta Y \text{ or } V^{\mathbf{E}})_{\text{expt}} - (\Delta Y \text{ or } V^{\mathbf{E}})_{\text{calc}}\}^2 / (m-p)\right]^{1/2}$$
(6)

where m is the number of data points and p is the number of estimated parameters. The results of A_i and σ are presented in Table 3.

Excess volumes at 298.15 K, presented in Figure 1, are positive over the entire range of mole fractions. This suggests that the mild dispersion-type interactions are present in these mixtures. At equimolar compositions of the mixtures, the $V^{\rm E}$ values for diglyme with dodecane or tetradecane are almost identical, but hexadecane-containing mixtures show the highest value of $V^{\rm E}$ at $x_1 = 0.5$, while diglyme + nonane mixtures exhibit the lowest $V^{\rm E}$ at $x_1 = 0.5$. This shows the dependence of $V^{\rm E}$ on the chain length of *n*-alkanes.

Quite opposite behavior is seen for the dependence of $\Delta \eta$ on x_1 at 298.15 K (Figure 2). The negative $\Delta \eta$ values increase from hexadecane to nonane. The $\Delta \eta$ versus x_1 curves for nonane and decane are similar. The same observations are seen for Δu at 298.15 K (Figure 3).

The deviations in molar refractivity have been calculated using the Lorentz-Lorenz (11, 12) mixing rule using volume fraction instead of mole fraction averages. The dependence of ΔR on ϕ_1 at 298.15 K is shown in Figure 4. Here, a systematic dependence of ΔR on the alkane chain length is observed. The negative values of ΔR increase considerably from nonane to hexadecane.

The results of Δk_s calculated on the basis of the volume fraction are presented in Figure 5. The positive values of Δk_s are observed for all the binary mixtures at all compositions. However, there is no systematic dependence of Δk_s on the size of the *n*-alkanes.

The effect of temperature on the $V^{\rm E}$, $\Delta \eta$, Δu , and $\Delta k_{\rm s}$ show a systematic increase with temperature. This dependence is shown in Figure 6 for the diglyme + tetradecane mixtures. The effect of temperature on ΔR is not very significant for all the mixtures, and hence, the dependence is shown by a single curve for all temperatures (Figure 7).

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