D3.1 Liquids and Gases

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In the previous edition, this section containing thermophysical data of 275 compounds had been supplemented by correlations for temperature-dependent properties in order to give a better opportunity for interpolation and, with the appropriate caution, extrapolation. With the help of these correlations, the user can make use of the data in process simulation programs.

Most of the data points given in the tables have been obtained by regression of experimental data from the literature or the relevant databanks. During this regression, a careful evaluation of the data has been performed, and outliers have been removed from the database. The equations listed below have been used for this regression. The final correlations are at least valid in the temperature range where data points are given in the tables. Although the correlations are usually suitable for extrapolation, one should be careful to go beyond this range. Especially when polynoms are used, a plausible curvature should be maintained (see Chap. D1).

In comparison to the previous German edition of the VDI Heat Atlas, for the liquid density, the liquid viscosity, the enthalpy of vaporization and the specific heat capacities of liquids and ideal gases the new PPDS equations have been used. Currently, these equations seem to be the most accurate ones and show a reasonable extrapolation behavior. For the vapor pressure, the 2.5-5-form of the Wagner equation is used, which performs slightly better than the well established 3-6-form.

Whenever it was possible, high-precision equations of state have been used to obtain artificial data points as the basis for the regression. On the other hand, many values for transport properties, especially for gases, have been obtained by the estimation methods described in Chap. D1.

In general, all the values and correlations are not the absolutely correct ones but refer to the best possible data according to the knowledge of the authors. Like all data collections, also this one cannot claim completeness or absolute reliability. The authors are grateful for hints on mistakes and general improvements of this chapter.

The correlation equations for the temperature-dependent properties are:

Liquid density

$$\frac{\rho_{\mathrm{liq}}}{\mathrm{kg/m^3}} = \frac{\rho_c}{\mathrm{kg/m^3}} + A\left(1-\frac{T}{T_c}\right)^{0.35} + B\left(1-\frac{T}{T_c}\right)^{2/3} + C\left(1-\frac{T}{T_c}\right) + D\left(1-\frac{T}{T_c}\right)^{4/3} \tag{1}$$

Dynamic viscosity of liquids

$$\frac{\eta}{\mathrm{Pa\,s}} = E\cdot\exp\left[A\left(\frac{C-T}{T-D}\right)^{1/3} + B\left(\frac{C-T}{T-D}\right)^{4/3}\right] \tag{2}$$

When Eq. (2) is programmed, it must be taken care that the term in brackets $(C-T)/(T-D)$ sometimes turns out to be negative, so that it makes sense to write in these cases

$$\left(\frac{C-T}{T-D}\right)^{1/3} = -\left(\frac{T-C}{T-D}\right)^{1/3}$$

and

$$\left(\frac{C-T}{T-D}\right)^{4/3} = -\left(\frac{T-C}{T-D}\right)^{1/3}\left(\frac{C-T}{T-D}\right) \tag{2a}$$

Dynamic viscosity of gases

$$\frac{\eta}{\mathrm{Pa\,s}} = A + B\frac{T}{K} + C\left(\frac{T}{K}\right)^2 + D\left(\frac{T}{K}\right)^3 + E\left(\frac{T}{K}\right)^4 \tag{3}$$

Thermal conductivity of liquids

$$\frac{\lambda}{\mathrm{W/mK}} = A + B\frac{T}{K} + C\left(\frac{T}{K}\right)^2 + D\left(\frac{T}{K}\right)^3 + E\left(\frac{T}{K}\right)^4 \tag{4}$$

Thermal conductivity of gases

$$\frac{\lambda}{\mathrm{W/mK}} = A + B\frac{T}{K} + C\left(\frac{T}{K}\right)^2 + D\left(\frac{T}{K}\right)^3 + E\left(\frac{T}{K}\right)^4 \tag{5}$$

Surface tension

$$\frac{\sigma}{\mathrm{N/m}} = A\left(1-\frac{T}{T_c}\right)^{B+C(T/T_c)+D(T/T_c)^2+E(T/T_c)^3} \tag{6}$$

Vapor pressure

$$\ln\frac{p_s}{p_c} = \frac{T_c}{T}\left[A\left(1-\frac{T}{T_c}\right) + B\left(1-\frac{T}{T_c}\right)^{1.5} + C\left(1-\frac{T}{T_c}\right)^{2.5} + D\left(1-\frac{T}{T_c}\right)^{5}\right] \tag{7}$$

Specific heat capacity of liquids

$$c_p^{\mathrm{liq}} = R\left(\frac{A}{1-\frac{T}{T_c}} + B + C\left(1-\frac{T}{T_c}\right) + D\left(1-\frac{T}{T_c}\right)^2 + E\left(1-\frac{T}{T_c}\right)^3 + F\left(1-\frac{T}{T_c}\right)^4\right) \tag{8}$$

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Equation (8) reduces to a polynomial if the first parameter A is set to 0. For many substances, only few data points are known so that it is not justified to fit all the parameters.
In these cases, extrapolation beyond the range of validity should be avoided.

Enthalpy of vaporization

$$\Delta h_v = RT_c\left[A\left(1-\frac{T}{T_c}\right)^{1/3}+B\left(1-\frac{T}{T_c}\right)^{2/3}+C\left(1-\frac{T}{T_c}\right)+D\left(1-\frac{T}{T_c}\right)^{2}+E\left(1-\frac{T}{T_c}\right)^{6}\right] \quad (9)$$

Specific heat capacity of ideal gases

$$\frac{c_p^{id}}{R} = B+(C-B)\left(\frac{T}{A+T}\right)^2\left[1-\frac{A}{A+T}\left(D+E\frac{T}{A+T}+F\left(\frac{T}{A+T}\right)^2+G\left(\frac{T}{A+T}\right)^3\right)\right] \quad (10)$$

The symbols are explained in Chap. D1. If the data points are recalculated from the parameters, small deviations due to approximation errors of the parameters might occur.

D3.1. Table 1. Caloric and critical data

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
Elements										
Xenon	Xe	131.29	−111.9	17.5	−108.1	95.6	289.73	58.42	1103	0.004
Krypton	Kr	83.80	−157.4	19.6	−153.4	107.1	209.48	55.25	910	−0.001
Argon	Ar	39.95	−189.4	29.6	−185.9	161.1	150.69	48.63	536	−0.002
Neon	Ne	20.18	−248.6	16.3	−246.1	85.8	44.49	26.79	482	−0.039
Helium	He	4.00	−271.4	12.5	−268.9	20.8	5.20	2.27	70	−0.384
Air		28.96	−210.1	25.7	−194.2	191.9	132.53	37.86	343	0.038
Hydrogen	H_2	2.02	−259.3	58.1	−252.8	459.2	33.19	13.15	30	−0.219
Nitrogen	N_2	28.01	−210.1	25.7	−195.8	199.2	126.19	33.96	313	0.037
Oxygen	O_2	32.00	−218.8	13.9	−183.0	213.1	154.60	50.46	427	0.022
Sulfur	S	32.06	115.3	53.9	444.2	277.4	1312.95	182.08	203	0.246
Fluorine	F_2	38.00	−219.7	13.4	−188.1	174.3	144.41	52.40	593	0.051
Chlorine	Cl_2	70.91	−101.0	90.3	−34.0	288.0	416.96	79.91	577	0.087
Bromine	Br_2	159.82	−7.3	66.1	58.7	186.5	584.15	103.00	1183	0.129
Iodine	I_2	253.80	113.7	61.1	184.4	165.3	819.15	116.54	1637	0.112
Anorganic compounds										
Hydrogen fluoride	HF	20.01	−83.4	228.9	19.5	380.5	461.15	64.80	290	0.381
Hydrogen chloride	HCl	36.46	−114.3	54.9	−85.1	448.3	324.65	83.10	450	0.131
Hydrogen bromide	HBr	80.92	−86.9	29.7	−66.6	220.3	363.15	85.52	809	0.073
Hydrogen iodide	HI	127.91	−50.9	22.5	−35.4	158.4	423.85	83.10	1049	0.038
Hydrogen cyanide	HCN	27.02	−13.3	311.0	25.7	998.6	456.65	53.90	194	0.410
Water	H_2O	18.02	0.0	333.1	100.0	2256.6	647.10	220.64	322	0.344
Hydrogen sulfide	H_2S	34.08	−85.5	69.7	−60.3	546.5	373.10	89.99	349	0.100
Ammonia	NH_3	17.03	−77.8	332.2	−33.3	1369.2	405.50	113.59	225	0.256
Nitric oxide	NO	30.01	−161.0	76.7	−151.8	452.6	180.15	64.80	517	0.583
Nitrogen dioxide	NO_2	46.01	−11.3	318.4	21.2	720.5	431.15	101.32	558	0.851
Nitrous oxide	N_2O	44.01	−90.9	148.6	−88.5	374.4	309.52	72.45	454	0.162
Dinitrogentetroxide	N_2O_4	92.01	−11.3	159.2	21.3	358.4	431.10	101.32	1115	0.853
Cyanogen	C_2N_2	52.04	−27.9	155.8	−21.1	448.8	400.15	59.78	267	0.279
Phosphorus trichloride	PCl_3	137.33	−92.0	51.6	75.0	216.9	563.15	56.70	528	0.220
Cyanogen chloride	ClCN	61.47	−6.5	185.3	12.8	435.1	449.05	59.90	377	0.323
Silane	SiH_4	32.12	−184.7	20.8	−112.0	374.5	269.75	48.40	242	0.093
Tetrachlorosilane	$SiCl_4$	169.90	−68.8	45.1	57.2	165.4	507.05	35.90	521	0.232

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
Carbon monoxide	CO	28.01	−205.0	30.0	−191.5	214.7	132.86	34.98	304	0.050
Carbon dioxide	CO_2	44.01	−56.6	204.9			304.13	73.77	468	0.224
Carbon suboxide	C_3O_2	68.03	−112.2	79.4	6.4	363.8	427.58	69.44	383	0.522
Carbonyl sulfide	COS	60.07	−138.9	78.7	−50.2	309.0	378.77	63.69	447	0.098
Phosgene	CCl_2O	98.92	−127.9	58.0	7.7	249.3	455.05	56.74	521	0.201
Carbon disulfide	CS_2	76.14	−111.6	57.7	46.2	353.3	552.05	79.00	476	0.121
Sulfur dioxide	SO_2	64.06	−73.2	115.5	−10.0	389.1	430.64	78.76	525	0.255
Sulfur trioxide	SO_3	80.06	16.8	94.1	44.5	509.0	490.85	82.10	631	0.424
Sulfuryl chloride	Cl_2SO_2	134.97	−54.1		69.4	222.1	545.05	46.10	577	0.176
Sulfur hexafluoride	SF_6	146.05	−50.8	34.4			318.88	37.66	742	0.215
Organic compounds containing sulfur										
Methyl mercaptan	CH_4S	48.11	−123.0	122.7	6.0	511.0	469.95	72.30	332	0.158
Ethyl mercaptan	C_2H_6S	62.13	−147.9	80.1	35.0	432.5	499.15	54.90	300	0.188
Dimethyl sulfide	C_2H_6S	62.13	−98.0		37.4	437.1	503.00	55.30	309	0.195
Diethyl sulfide	$C_4H_{10}S$	90.19	−103.9	132.0	92.2	352.4	557.15	39.60	284	0.290
Thiophene	C_4H_4S	84.14	−38.3	60.4	84.2	375.8	579.35	56.90	384	0.197
Halogenated hydrocarbons										
Fluoromethane (R41)	CH_3F	34.03	−141.9	145.4	−78.4	487.8	317.28	59.06	319	0.200
Difluoromethane (R32)	CH_2F_2	52.02	−136.1	99.2	−51.7	382.0	351.26	57.83	424	0.277
Trifluoromethane (R23)	CHF_3	70.01	−155.2	58.0	−82.1	238.7	299.75	48.69	526	0.258
Tetrafluoromethane (R14)	CF_4	88.00	−183.7	8.1	−128.1	133.6	227.55	37.40	629	0.178
Methyl chloride	CH_3Cl	50.49	−97.8	129.7	−24.1	428.1	416.25	66.80	353	0.154
Methylene chloride	CH_2Cl_2	84.93	−95.1	54.2	39.8	333.9	510.05	60.80	459	0.198
Chloroform	$CHCl_3$	119.38	−63.5	79.9	61.1	247.5	536.45	55.54	508	0.229
Carbon tetrachloride	CCl_4	153.82	−22.9	16.5	76.7	194.2	556.35	45.60	557	0.193
Bromomethane	CH_3Br	94.94	−93.6	63.0	3.6	255.2	467.05	80.00	609	0.191
Dibromomethane	CH_2Br_2	173.85	−52.5	43.2	97.0	194.4	611.05	71.70	779	0.209
Tribromomethane	$CHBr_3$	252.75	8.2	45.9	149.2	149.3	696.05	60.90	883	0.156
Tetrabromomethane	CBr_4	331.65	92.0		189.3	120.6	724.80	96.31	1009	0.584
Chlorodifluoromethane (R22)	$CHClF_2$	86.47	−157.4	47.7	−40.8	234.0	369.28	49.88	520	0.221
Dichlorofluoromethane (R21)	$CHCl_2F$	102.92	−135.0	51.0	8.8	242.2	451.55	51.84	525	0.205
Chlorotrifluoromethane (R13)	$CClF_3$	104.46	−181.0	33.5	−81.4	150.0	302.05	38.70	579	0.172
Dichlorodifluoromethane (R12)	CCl_2F_2	120.91	−158.0	34.2	−29.8	166.2	385.12	41.36	565	0.179
Trichlorofluoromethane (R11)	CCl_3F	137.37	−111.1	50.2	23.6	181.8	471.06	43.94	565	0.188
Ethyl fluoride (R161)	C_2H_5F	48.06	−143.3	124.8	−37.7	418.3	375.30	50.28	293	0.220
Ethyl chloride	C_2H_5Cl	64.52	−136.4	69.0	12.3	383.0	460.35	52.70	323	0.192
Ethyl bromide	C_2H_5Br	108.97	−118.6	53.8	38.4	249.6	503.75	62.30	507	0.252
1,1-Dichloroethane	$C_2H_4Cl_2$	98.96	−97.0	79.5	57.1	296.7	523.05	50.70	412	0.233
1,2-Dichloroethane	$C_2H_4Cl_2$	98.96	−35.7	89.2	83.6	323.7	561.60	53.70	450	0.285
1,2-Dibromoethane	$C_2H_4Br_2$	187.87	9.8	58.3	131.5	191.3	650.20	54.77	718	0.207
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	84.04	−111.4	73.7	−47.2	226.7	345.86	37.62	431	0.262
1,1,1-Trichloroethane	$C_2H_3Cl_3$	133.41	−30.0	17.6	74.1	223.0	545.05	43.00	475	0.217
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$	167.85	−43.9	54.6	145.9	225.5	645.05	40.90	517	0.253
Pentachloroethane	C_2HCl_5	202.29	−29.0	56.1	160.4	191.5	646.00	34.80	548	0.337
Hexachloroethane	C_2Cl_6	236.74	186.8	41.2			695.05	33.40	575	0.238

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$	203.83	24.9	18.2	93.0	156.8	551.05	34.34	581	0.290
1,1,2-Trichlorotrifluoroethane	$C_2Cl_3F_3$	187.38	−36.3	13.2	47.6	144.3	487.21	33.92	560	0.253
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	170.92	−92.5	8.8	3.6	135.7	418.85	32.60	581	0.252
1-Chloropropane	C_3H_7Cl	78.54	−122.9	70.6	46.5	354.7	503.15	45.80	318	0.227
1-Chlorobutane	C_4H_9Cl	92.57	−123.1	89.0	78.7	327.7	542.00	36.80	309	0.226
1-Chloropentane	$C_5H_{11}Cl$	106.60	−99.0		108.5	314.3	568.05	33.50	303	0.318
Chlorotrifluoroethene	C_2ClF_3	116.47	−158.1	47.7	−28.8	224.2	379.15	40.53	549	0.242
Vinyl chloride	C_2H_3Cl	62.50	−153.9	75.9	−13.8	353.5	432.05	56.70	349	0.100
1,1-Dichloroethene	$C_2H_2Cl_2$	96.94	−122.6	67.2	31.7	269.6	482.05	51.90	433	0.272
Trichloroethene	C_2HCl_3	131.39	−84.9		86.2	242.4	571.05	49.10	513	0.210
Tetrachloroethene	C_2Cl_4	165.83	−22.4	63.1	121.0	210.5	620.05	44.90	669	0.214
Fluorobenzene	C_6H_5F	96.10	−42.3	117.6	85.2	329.4	560.05	45.51	357	0.248
Chlorobenzene	C_6H_5Cl	112.56	−45.3	84.9	131.9	316.4	632.35	45.19	366	0.250
Bromobenzene	C_6H_5Br	157.01	−30.8	67.7	156.0	239.4	670.20	45.19	485	0.251
Iodobenzene	C_6H_5I	204.01	−31.4	47.8	188.3	200.4	721.20	45.19	581	0.247
m-Chlorotoluene	C_7H_7Cl	126.59	−48.0		162.8	312.1	660.75	39.54	347	0.307
Benzyl chloride	C_7H_7Cl	126.59	−39.0		179.5	324.1	686.05	39.10	352	0.314
***n*-Alkanes**										
Methane	CH_4	16.04	−182.5	58.7	−161.5	510.8	190.56	45.99	163	0.011
Ethane	C_2H_6	30.07	−182.9	95.1	−88.6	489.5	305.32	48.72	206	0.100
Propane	C_3H_8	44.10	−187.7	79.9	−42.1	426.1	369.82	42.48	221	0.152
n-Butane	C_4H_{10}	58.12	−138.4	80.2	−0.5	385.9	425.13	37.96	228	0.201
n-Pentane	C_5H_{12}	72.15	−129.8	116.4	36.1	357.7	469.66	33.69	235	0.252
n-Hexane	C_6H_{14}	86.18	−95.4	151.8	68.7	334.9	507.79	30.42	223	0.300
n-Heptane	C_7H_{16}	100.21	−90.6	140.2	98.4	316.7	541.23	27.74	225	0.346
n-Octane	C_8H_{18}	114.23	−56.9	181.6	125.6	302.1	569.57	25.07	228	0.394
n-Nonane	C_9H_{20}	128.26	−53.5	120.6	150.8	288.5	594.55	22.82	234	0.444
n-Decane	$C_{10}H_{22}$	142.29	−29.6	201.8	174.1	276.3	617.70	21.01	234	0.488
n-Undecane	$C_{11}H_{24}$	156.31	−25.6	141.9	195.9	270.2	639.05	19.50	237	0.530
n-Dodecane	$C_{12}H_{26}$	170.34	−9.5	216.3	216.3	256.2	658.10	18.18	238	0.574
n-Tridecane	$C_{13}H_{28}$	184.37	−5.3	154.6	235.4	252.0	675.05	16.80	238	0.618
n-Tetradecane	$C_{14}H_{30}$	198.39	6.0	227.2	253.5	242.5	693.05	15.70	239	0.643
n-Pentadecane	$C_{15}H_{32}$	212.42	10.0	162.8	270.6	237.7	708.05	14.80	239	0.685
n-Hexadecane	$C_{16}H_{34}$	226.45	18.3	235.6	286.7	231.6	723.05	14.00	240	0.717
n-Heptadecane	$C_{17}H_{36}$	240.47	22.0	167.0	302.4	228.9	736.05	13.40	241	0.769
n-Octadecane	$C_{18}H_{38}$	254.50	28.3	242.5	316.2	219.5	747.05	12.70	240	0.811
n-Nonadecane	$C_{19}H_{40}$	268.53	32.0	170.6	330.1	214.2	758.05	12.10	240	0.852
n-Eicosane	$C_{20}H_{42}$	282.56	36.5	247.3	343.7	204.8	769.63	11.28	234	0.875
Isoalkanes										
Isobutane	C_4H_{10}	58.12	−159.6	78.1	−11.7	365.4	407.81	36.29	226	0.184
2-Methyl butane	C_5H_{12}	72.15	−159.9	71.4	27.8	343.6	460.35	33.78	237	0.228
2,2-Dimethyl propane	C_5H_{12}	72.15	−16.6	43.6	9.5	315.5	433.74	31.96	238	0.196
2-Methyl pentane	C_6H_{14}	86.18	−153.6	72.7	60.2	323.0	497.70	30.43	236	0.280
3-Methyl pentane	C_6H_{14}	86.18	−162.9	61.5	63.3	326.6	504.65	31.20	234	0.270
2,2-Dimethyl butane	C_6H_{14}	86.18	−98.9	6.7	49.7	307.5	489.00	31.00	241	0.234
2,3-Dimethyl butane	C_6H_{14}	86.18	−128.0	9.3	57.9	317.6	500.00	31.51	240	0.248

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
Olefins										
Ethylene	C_2H_4	28.05	−169.1	119.4	−103.8	482.7	282.35	50.42	214	0.087
Propylene	C_3H_6	42.08	−85.4	71.4	−47.7	439.5	365.57	46.65	223	0.141
1-Butene	C_4H_8	56.11	−185.4	68.6	−6.3	392.2	419.29	40.06	238	0.192
1-Pentene	C_5H_{10}	70.14	−165.1	84.7	30.0	362.2	464.75	35.60	235	0.237
1-Hexene	C_6H_{12}	84.16	−139.9	111.1	63.5	339.1	504.05	31.40	238	0.280
1-Heptene	C_7H_{14}	98.19	−118.9		93.7	319.5	537.40	29.20	244	0.344
1-Octene	C_8H_{16}	112.22	−101.8	136.4	121.3	306.4	567.05	26.80	240	0.392
Propadiene	C_3H_4	40.06	−136.4		−34.4	489.5	393.15	50.90	243	0.132
1,2-Butadiene	C_4H_6	54.09	−136.3	128.7	10.9	440.5	452.00	43.60	246	0.166
1,3-Butadiene	C_4H_6	54.09	−108.9	147.6	−4.5	416.3	425.15	42.77	245	0.190
1,2-Pentadiene	C_5H_8	68.12	−137.4	111.0	44.8	398.6	500.05	38.00	247	0.154
trans-1,3-Pentadiene	C_5H_8	68.12	−87.4	104.9	42.0	392.2	500.05	37.40	247	0.116
1,4-Pentadiene	C_5H_8	68.12	−148.3	89.2	26.0	359.5	479.00	37.40	225	0.084
2,3-Pentadiene	C_5H_8	68.12	−125.7	95.8	48.3	407.4	497.00	38.00	231	0.218
Acetylene and derivatives										
Acetylene	C_2H_2	26.04	−80.9	144.8			308.35	61.39	230	0.190
Propyne	C_3H_4	40.06	−102.8	133.5	−23.1	554.9	402.40	56.30	244	0.211
2-Butyne	C_4H_6	54.09	−32.3	170.7	27.0	492.0	473.20	48.70	245	0.238
1-Butyne	C_4H_6	54.09	−125.8	111.5	8.1	459.8	440.00	46.00	260	0.247
Naphthenes										
Cyclopropane	C_3H_6	42.08	−127.6	129.3	−32.8	473.4	397.95	54.95	259	0.133
Cyclobutane	C_4H_8	56.11	−90.7	19.4	12.5	427.8	459.90	49.80	267	0.185
Cyclopentane	C_5H_{10}	70.14	−93.9	8.7	49.2	387.3	511.70	45.25	270	0.196
Methyl cyclopentane	C_6H_{12}	84.16	−142.4	82.3	71.8	347.6	532.75	37.90	264	0.231
Ethyl cyclopentane	C_7H_{14}	98.19	−138.5	70.0	103.4	326.6	569.50	34.00	262	0.270
Propyl cyclopentane	C_8H_{16}	112.22	−117.4	89.4	131.0	310.9	596.00	30.20	262	0.327
Butyl cyclopentane	C_9H_{18}	126.24	−108.0	89.6	156.4	286.7	621.00	27.20	261	0.372
Pentyl cyclopentane	$C_{10}H_{20}$	140.27	−83.0		180.5	278.1	656.20	24.67	257	0.329
Hexyl cyclopentane	$C_{11}H_{22}$	154.30	−73.0		203.1	273.0	660.10	21.38	259	0.476
Cyclohexane	C_6H_{12}	84.16	6.5	32.6	80.7	356.1	553.60	40.75	273	0.209
Methyl cyclohexane	C_7H_{14}	98.19	−126.6	68.8	100.9	320.1	572.15	34.71	267	0.235
Ethyl cyclohexane	C_8H_{16}	112.22	−111.4	74.3	131.9	305.6	609.15	30.40	261	0.246
Propyl cyclohexane	C_9H_{18}	126.24	−94.9	82.1	156.7	288.7	639.20	28.07	265	0.260
Butyl cyclohexane	$C_{10}H_{20}$	140.27	−74.8	100.9	181.0	278.2	667.00	25.70	263	0.274
Pentyl cyclohexane	$C_{11}H_{22}$	154.30	−72.9		203.7	275.8	667.85	22.04	264	0.430
Hexyl cyclohexane	$C_{12}H_{24}$	168.32	−45.3		224.7	270.6	693.60	22.60	249	0.468
Cyclopentene	C_5H_8	68.12	−135.1	49.4	44.3	396.6	507.00	48.00	278	0.196
Cyclohexene	C_6H_{10}	82.15	−103.5	40.1	83.0	371.3	560.45	43.50	282	0.211
Aromatic compounds										
Benzene	C_6H_6	78.11	5.5	126.3	80.1	393.7	562.01	49.01	306	0.210
Toluene	C_7H_8	92.14	−95.0	72.0	110.6	360.8	591.75	41.26	292	0.266
Ethyl benzene	C_8H_{10}	106.17	−94.9	86.5	136.2	336.8	617.05	36.13	283	0.304
Propyl benzene	C_9H_{12}	120.19	−99.6	77.1	159.2	313.1	638.35	31.96	274	0.344
Butyl benzene	$C_{10}H_{14}$	134.22	−87.9	83.6	183.3	301.5	660.50	28.90	270	0.394
Pentyl benzene	$C_{11}H_{16}$	148.25	−75.1	102.8	205.6	286.5	679.90	26.04	270	0.438
Hexyl benzene	$C_{12}H_{18}$	162.28	−61.2	113.4	226.2	274.4	698.00	23.80	274	0.479
o-Xylene	C_8H_{10}	106.17	−25.3	128.1	144.4	347.6	630.25	37.32	287	0.312
m-Xylene	C_8H_{10}	106.17	−47.9	109.0	139.1	342.3	617.05	35.41	283	0.327

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
p-Xylene	C_8H_{10}	106.17	13.3	161.2	138.4	339.8	616.25	35.11	281	0.322
1,2,3-Trimethyl benzene	C_9H_{12}	120.19	−25.4	68.1	176.2	335.4	664.50	34.54	290	0.367
1,2,4-Trimethyl benzene	C_9H_{12}	120.19	−43.9	109.7	169.4	328.2	649.05	32.32	280	0.378
1,3,5-Trimethyl benzene	C_9H_{12}	120.19	−44.8	79.2	164.7	326.1	637.30	31.27	278	0.399
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$	134.22	−6.3	83.7	205.1	321.1	693.00	31.10	283	0.417
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$	134.22	−23.7	79.9	198.1	317.4	679.00	29.70	279	0.424
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$	134.22	79.3	156.5	196.7	317.9	676.00	29.00	279	0.422
Pentamethyl benzene	$C_{11}H_{16}$	148.25	54.4	83.2	231.5	312.7	719.20	28.70	276	0.464
Hexamethyl benzene	$C_{12}H_{18}$	162.28	165.5	127.2	263.5	311.5	758.00	27.70	274	0.496
Styrene	C_8H_8	104.15	−30.6	105.1	145.4	355.7	636.05	38.40	296	0.295
Isopropyl benzene	C_9H_{12}	120.19	−96.0	61.0	152.4	310.7	631.05	32.09	277	0.327
Biphenyl	$C_{12}H_{10}$	154.21	69.2	120.5	255.3	315.5	789.00	38.50	310	0.365
Diphenyl methane	$C_{13}H_{12}$	168.24	25.3	108.2	264.6	292.7	760.00	27.10	299	0.482
Triphenyl methane	$C_{19}H_{16}$	244.34	92.2	90.0	359.5	245.5	865.00	22.00	325	0.574
Tetraphenyl methane	$C_{25}H_{20}$	320.43	288.1		469.7	221.6	983.00	17.90	332	0.679
Naphthalene	$C_{10}H_8$	128.17	80.3	148.1	218.0	338.5	748.45	40.50	315	0.304
1-Methylnaphthalene	$C_{11}H_{10}$	142.20	−30.5	48.8	244.5	327.3	772.00	36.00	306	0.342
2-Methylnaphthalene	$C_{11}H_{10}$	142.20	34.6	85.2	241.6	325.1	761.00	35.00	306	0.378
1-Ethylnaphthalene	$C_{12}H_{12}$	156.23	−13.9	104.3	258.2	312.1	776.00	33.20	300	0.407
2-Ethylnaphthalene	$C_{12}H_{12}$	156.23	−7.3	94.1	258.4	307.3	771.00	31.70	300	0.421
Alcohols										
Methanol	CH_4O	32.04	−97.7	100.3	64.5	1102.0	513.38	82.16	282	0.563
Ethanol	C_2H_6O	46.07	−114.1	107.0	78.3	850.1	513.90	61.48	276	0.644
1-Propanol	C_3H_8O	60.10	−126.3	89.4	97.2	696.9	536.75	51.75	274	0.621
1-Butanol	$C_4H_{10}O$	74.12	−89.4	126.4	117.8	585.3	563.05	44.23	270	0.591
1-Pentanol	$C_5H_{12}O$	88.15	−77.6	111.1	137.9	500.4	586.15	38.80	270	0.591
1-Hexanol	$C_6H_{14}O$	102.18	−44.6	150.7	157.7	448.7	611.35	35.10	268	0.578
1-Heptanol	$C_7H_{16}O$	116.20	−34.1	156.4	176.6	401.2	632.60	30.58	267	0.567
1-Octanol	$C_8H_{18}O$	130.23	−15.6	172.8	195.3	368.5	652.55	28.60	266	0.593
Isopropanol	C_3H_8O	60.10	−87.9	90.0	82.2	677.2	508.25	47.62	273	0.663
2-Methyl-1-propanol	$C_4H_{10}O$	74.12	−108.0	85.3	107.9	564.0	547.75	43.00	272	0.590
3-Methyl-1-butanol	$C_5H_{12}O$	88.15	−117.3	75.0	131.3	500.5	577.25	39.30	270	0.595
Ethylene glycol	$C_2H_6O_2$	62.07	−13.1	160.4	197.1	867.5	719.15	82.00	325	0.513
1,3-Propylene glycol	$C_3H_8O_2$	76.09	−26.8	93.3	214.1	733.7	724.05	95.00	351	0.738
Glycerol	$C_3H_8O_3$	92.09	18.3	198.5	287.7	718.6	850.05	75.00	349	0.512
Cyclohexanol	$C_6H_{12}O$	100.16	23.5	17.8	160.9	451.7	650.05	42.60	311	0.370
Benzyl alcohol	C_7H_8O	108.14	−15.3	83.0	204.5	454.3	720.15	45.01	323	0.362
Phenols										
o-Cresol	C_7H_8O	108.14	31.0	146.3	190.8	423.1	697.55	50.10	383	0.433
m-Cresol	C_7H_8O	108.14	12.3	99.0	202.2	445.2	705.85	45.60	347	0.448
p-Cresol	C_7H_8O	108.14	34.8	117.5	202.0	445.3	704.65	51.50	391	0.509
Phenol	C_6H_6O	94.11	41.0	122.3	181.9	489.5	694.25	61.30	411	0.442
Carboxylic acids										
Formic acid	CH_2O_2	46.02	8.5	275.9	100.6	480.7	588.05	58.10	368	0.316
Acetic acid	$C_2H_4O_2$	60.05	16.8	195.3	117.9	397.9	591.95	57.86	334	0.463
Propionic acid	$C_3H_6O_2$	74.08	−20.8	143.9	141.2	419.4	600.85	46.17	318	0.576
Butyric acid	$C_4H_8O_2$	88.11	−5.3	131.5	163.7	402.6	615.75	40.64	302	0.681
Valeric acid	$C_5H_{10}O_2$	102.13	−29.4	71.7	175.6	395.3	634.05	38.90	304	0.647

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
Caproic acid	$C_6H_{12}O_2$	116.16	−3.8	132.6	204.5	394.0	660.20	33.08	281	0.730
Acetic anhydride	$C_4H_6O_3$	102.09	−73.0	102.8	139.5	394.5	606.05	40.00	352	0.454
Propionic anhydride	$C_6H_{10}O_3$	130.14	−45.1		167.0	326.9	623.00	32.70	329	0.560
Chloroacetic acid	$C_2H_3ClO_2$	94.50	60.0	130.2	189.0	523.8	686.05	57.80	428	0.546
Dichloroacetic acid	$C_2H_2Cl_2O_2$	128.94	13.5	95.7	193.9	379.5	686.05	51.70	487	0.555
Trichloroacetic acid	$C_2HCl_3O_2$	163.39	57.0	36.0	197.7	302.7	688.05	48.10	529	0.549
Ketones										
Ketene	C_2H_2O	42.04	−151.1		−49.7	461.0	370.05	58.10	292	0.125
Acetone	C_3H_6O	58.08	−94.8	99.4	56.1	501.7	508.10	46.92	274	0.306
Methyl ethyl ketone	C_4H_8O	72.11	−86.8	116.3	79.6	441.2	535.55	41.50	270	0.323
Diethyl ketone	$C_5H_{10}O$	86.13	−39.0	134.6	101.9	393.3	561.00	37.40	256	0.345
Dipropyl ketone	$C_7H_{14}O$	114.19	−32.6	162.9	144.2	327.8	602.00	29.20	263	0.412
Acetophenone	C_8H_8O	120.15	19.7	85.7	202.4	367.4	709.50	38.40	311	0.364
Benzophenone	$C_{13}H_{10}O$	182.22	48.3	92.8	305.6	301.0	830.05	33.52	321	0.500
Ethers										
Dimethyl ether	C_2H_6O	46.07	−141.5	107.2	−24.8	470.5	400.30	53.41	277	0.188
Diethyl ether	$C_4H_{10}O$	74.12	−116.4	97.0	34.5	357.7	466.63	36.51	264	0.283
Dipropyl ether	$C_6H_{14}O$	102.18	−123.3	105.4	90.0	310.4	530.60	30.28	268	0.369
Methyl propyl ether	$C_4H_{10}O$	74.12	−139.2	103.5	38.9	363.5	476.30	38.01	269	0.277
Ethyl propyl ether	$C_5H_{12}O$	88.15	−127.6	95.2	63.8	312.9	500.20	33.70	260	0.347
Ethylene oxide	C_2H_4O	44.05	−112.5	117.4	10.5	587.1	469.15	71.90	314	0.197
Furane	C_4H_4O	68.08	−85.6	55.9	31.4	400.2	490.15	55.00	312	0.203
1,4-Dioxane	$C_4H_8O_2$	88.11	11.8	145.7	101.4	389.5	587.05	52.08	370	0.279
Aldehydes										
Formaldehyde	CH_2O	30.03	−92.0	234.8	−19.1	769.2	408.05	65.90	261	0.281
Acetaldehyde	C_2H_4O	44.05	−123.0	73.1	20.3	595.7	466.05	55.50	286	0.262
Paraldehyde	$C_6H_{12}O_3$	132.16	12.7	104.8	124.2	285.1	579.05	35.00	362	0.437
Furfural	$C_5H_4O_2$	96.08	−36.6	149.9	161.4	436.1	670.20	56.60	381	0.368
Benzaldehyde	C_7H_6O	106.12	−57.1	87.8	178.9	387.0	695.05	46.50	328	0.322
Salicylaldehyde	$C_7H_6O_2$	122.12	1.7	87.6	196.3	373.4	680.00	49.90	357	0.619
Esters										
Methyl formate	$C_2H_4O_2$	60.05	−99.0	125.4	31.8	470.6	487.25	60.00	349	0.255
Ethyl formate	$C_3H_6O_2$	74.08	−79.6	124.3	54.0	405.6	508.45	47.40	324	0.276
Propyl formate	$C_4H_8O_2$	88.11	−92.9	149.8	81.1	366.1	538.00	40.20	309	0.309
Methyl acetate	$C_3H_6O_2$	74.08	−98.0	107.6	56.9	411.8	506.55	47.50	325	0.331
Ethyl acetate	$C_4H_8O_2$	88.11	−83.5	118.9	77.1	366.2	523.20	38.30	308	0.361
Propyl acetate	$C_5H_{10}O_2$	102.13	−95.0	109.7	101.5	336.1	549.75	33.60	296	0.390
Methyl propionate	$C_4H_8O_2$	88.11	−87.6	114.6	79.5	368.4	530.60	40.04	312	0.347
Ethyl propionate	$C_5H_{10}O_2$	102.13	−73.9	120.4	99.0	333.8	546.05	33.62	296	0.389
Propyl propionate	$C_6H_{12}O_2$	116.16	−75.9	129.1	122.5	315.1	568.60	30.60	299	0.449
Methyl butyrate	$C_5H_{10}O_2$	102.13	−85.8	112.6	102.7	336.5	554.50	34.73	300	0.378
Ethyl butyrate	$C_6H_{12}O_2$	116.16	−98.1	107.6	121.4	310.9	571.00	29.50	288	0.401
Methyl benzoate	C_8H_8O2	136.15	−12.4	71.5	199.4	323.5	693.05	35.90	312	0.415
Ethyl benzoate	$C_9H_{10}O_2$	150.18	−34.8	94.6	213.3	300.3	698.00	31.80	307	0.477
Methyl salicylate	$C_8H_8O_3$	152.15	−8.0	117.0	220.6	313.7	709.00	40.90	371	0.581
Amines										
Methyl amine	CH_5N	31.06	−93.5	197.5	−6.4	843.4	430.05	74.60	202	0.282
Ethyl amine	C_2H_7N	45.09	−81.0	207.4	16.8	608.8	456.15	56.20	218	0.285
Propyl amine	C_3H_9N	59.11	−83.0	256.4	47.6	510.4	496.95	47.40	227	0.280
n-Butyl amine	$C_6H_{15}N$	73.14	−49.1	202.4	77.5	442.0	531.95	42.00	236	0.329
Dimethyl amine	C_2H_7N	45.09	−92.3	131.8	7.0	590.0	437.25	53.40	250	0.298

D3.1. Table 1. (continued)

Substance	Formula	Molecular weight g/mol	Melting temperature °C	Enthalpy of fusion J/g	Boiling point at 1.013 bar °C	Enthalpy of vaporization at 1.013 bar J/g	Critical temperature K	Critical pressure bar	Critical density kg/m³	Acentric factor
Trimethyl amine	C_3H_9N	59.11	−117.1	110.7	3.1	391.1	433.25	41.02	233	0.206
Diethyl amine	$C_6H_{15}N$	73.14	−49.9	155.9	55.6	397.2	496.65	37.10	243	0.301
Triethyl amine	C6H15N	101.19	−114.8	84.2	88.8	304.8	535.15	30.40	260	0.318
Piperidine	$C_5H_{11}N$	85.15	−10.6	134.1	106.4	394.0	594.00	46.51	277	0.243
Pyridine	C_6H_7N	79.10	−41.7	104.7	115.2	447.6	620.00	56.30	311	0.239
Aniline	C6H7N	93.13	−6.0	113.2	183.9	479.5	699.05	53.10	345	0.378
N-methyl aniline	C_7H_9N	107.16	−57.1	88.8	195.6	423.2	701.50	52.00	287	0.475
N,N-dimethyl aniline	$C_8H_{11}N$	121.18	2.5	95.4	193.4	352.4	687.20	36.30	261	0.402
N,N-diethyl aniline	$C_{10}H_{15}N$	149.24	−38.1	56.9	216.1	304.4	702.00	28.50	268	0.426
Phenylhydrazine	$C_6H_8N_2$	108.14	19.3	151.9	244.0	486.5	761.00	49.10	259	0.535
Diphenyl amine	$C_{12}H_{11}N$	169.23	53.0	110.5	302.4	323.7	817.00	31.80	314	0.530
Nitriles										
Acetonitrile	C_2H_3N	41.05	−43.9	198.9	81.4	778.7	545.55	48.30	237	0.334
Propionitrile	C_3H_5N	55.08	−92.9	91.3	97.7	572.2	564.40	41.80	241	0.324
Butyronitrile	C_4H_7N	69.11	−111.9	72.7	117.4	500.0	582.30	37.90	249	0.371
Benzonitrile	C_7H_5N	103.12	−12.8	105.5	190.8	403.6	699.35	42.15	329	0.367
Amides										
Formamide	CH_3NO	45.04	2.6	177.2	219.6	1136.0	771.00	78.00	276	0.412
Nitroderivates										
Nitromethane	CH_3NO_2	61.04	−28.6	159.0	101.2	571.4	588.20	63.10	353	0.347
Nitrobenzene	$C_6H_5NO_2$	123.11	5.8	94.2	210.7	359.7	719.05	44.00	353	0.443
o-Nitrotoluene	$C_7H_7NO_2$	137.14	−3.3	83.7	221.5	338.0	720.05	38.00	311	0.480
m-Nitrotoluene	$C_7H_7NO_2$	137.14	16.2	102.5	232.7	343.1	734.05	38.00	311	0.495
p-Nitrotoluene	$C_7H_7NO_2$	137.14	51.7	121.6	238.7	339.9	743.05	32.07	311	0.420

D3.1. Table 2. Density of saturated liquids in kg/m^3

Substance	Formula	Temperature (°C)									Equation (1)			
		−50	−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*
Elements														
Xenon	Xe	2503.6	2256.2	1906.9							2097.8096	−117.2877	962.2241	−217.6634
Krypton	Kr										1612.0090	342.4370	130.7723	178.6945
Argon	Ar										895.4345	297.7907	−15.9601	119.8686
Air											410.6099	777.4610	−841.3265	495.5129
Nitrogen	N_2										470.9224	493.2507	−560.4689	389.6108
Oxygen	O_2										748.3728	396.2376	−416.2389	372.6904
Sulfur	S							1777.7	1752.9	1727.1	3728.2432	−5258.9909	5203.2088	−1927.9722
Fluorine	F_2										677.5368	1399.1215	−1526.3565	870.3285
Chlorine	Cl_2	1605.5	1537.6	1467.0	1407.8	1311.9	1113.0				908.9019	948.0463	−1353.2681	1093.5278
Bromine	Br_2			3187.2	3119.8	3015.5	2831.1	2628.5	2397.7	2113.1	1672.7965	449.5091	676.7593	15.3973
Iodine	I_2							3874.9	3729.9	3576.4	1995.2359	589.1905	627.3536	65.6236
Anorganic compounds														
Hydrogen fluoride	HF	1124.3	1063.6	1002.2	952.4	875.9	739.5	574.6			232.8396	1347.9901	−1296.9204	1091.0626
Hydrogen chloride	HCl	1090.6	1009.6	916.3	825.2						640.0181	462.1796	−180.0873	273.3275
Hydrogen bromide	HBr	2115.2	2006.9	1887.2	1779.5	1584.0					1716.6784	−697.6208	1545.2372	−534.0575
Hydrogen iodide	HI	2857.0	2752.5	2640.9	2545.3	2387.8	2061.5				2159.6727	−837.4455	1907.8899	−675.9615
Hydrogen cyanide	HCN			716.3	687.2	640.7	552.8	436.3			576.9982	−153.5039	576.1976	−153.0246
Water	H_2O			1000.0	998.0	988.0	958.0	917.0	865.0	799.0	1094.0233	−1813.2295	3863.9557	−2479.8130
Hydrogen sulfide	H_2S	931.0	884.3	833.0	787.4	706.2					454.1590	757.2956	−698.1045	404.4247
Ammonia	NH_3	701.9	671.5	638.7	610.4	562.8	456.7				531.7253	−31.5027	257.0928	−63.9457
Nitric oxide	NO										1496.5803	−1584.2431	2252.1437	−1031.3210
Nitrogen dioxide	NO_2			1496.5	1450.1	1372.9	1211.1	901.6			1690.6809	−1592.7803	2233.6217	−968.0655
Nitrous oxide	N_2O	1109.7	1018.2	907.0	785.1						954.7062	−399.5870	1000.6634	−350.0132
Dinitrogentetroxide	N_2O_4			1472.7	1443.5						276.2115	−44.5981	604.1720	−135.9384
Cyanogen	C_2N_2		958.2	915.2	876.9	810.7	653.2				1378.7351	−1668.4751	2299.1821	−1052.1005
Phosphorus trichloride	PCl_3	1702.5	1658.5	1613.1	1575.8	1517.7	1414.0	1298.3	1162.5	982.2	1077.6858	−98.8936	665.5992	−117.8757
Cyanogen chloride	ClCN			1221.9	1182.2	1117.0	987.0	794.2			1387.6330	−1242.5960	1899.5222	−814.8977
Silane	SiH_4	453.5	384.5								202.1021	310.6035	−45.2615	142.0821
Tetrachlorosilane	$SiCl_4$	1611.8	1566.7	1519.7	1480.4	1418.3	1303.4	1165.8	974.6		1212.2339	−448.0911	977.9054	−307.7212
Carbon monoxide	CO										571.9328	−67.0956	387.1443	−121.7294
Carbon dioxide	CO_2	1154.5	1054.3	927.4	773.5						897.8727	170.0410	169.0516	37.9218
Carbon suboxide	C_3O_2	1195.8	1148.1	1097.1	1053.6	982.4	839.4				1139.6512	−1261.4775	2221.6476	−959.2381

D3.1. Table 2. (continued)

Substance	Formula	Temperature (°C)									Equation (1)			
		−50	−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*
Carbonyl sulfide	COS	1174.3	1118.4	1057.7	1004.2	910.3					614.6483	835.4859	−850.8364	540.4800
Phosgene	CCl_2O	1521.4	1471.5	1418.9	1374.4	1302.7	1163.2	967.3			1175.3830	−403.6009	832.6348	−231.8645
Carbon disulfide	CS_2	1366.5	1330.7	1293.9	1263.5	1216.4	1132.1	1037.7	925.7	770.0	731.6284	105.4039	368.2583	−27.6945
Sulfur dioxide	SO_2	1559.8	1499.3	1435.6	1381.6	1293.7	1115.8				1026.6061	287.4616	−59.1497	243.0818
Sulfur trioxide	SO_3				1925.6	1782.4	1536.2	1269.4	931.1		441.4331	1592.9448	−778.3064	1407.6855
Sulfuryl chloride	Cl_2SO_2	1806.7	1758.8	1709.4	1668.5	1604.5	1489.4	1358.8	1200.5	966.1	1181.0337	−220.5274	868.5840	−221.9166
Sulfur hexafluoride	SF_6	1851.6	1716.1	1558.5	1395.0						1159.8382	1894.1251	−3293.5522	2428.5215
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	956.4	926.3	894.6	868.1	825.6	744.9	639.9			704.5697	−263.8878	591.8503	−181.3799
Ethyl mercaptan	C_2H_6S	915.7	889.3	861.9	838.9	802.6	735.2	653.5	534.8		691.9049	−266.2214	555.0990	−164.0295
Dimethyl sulfide	C_2H_6S	921.0	896.3	870.3	848.5	813.8	749.3	671.2	559.9		761.5375	−501.7612	869.4948	−333.3843
Diethyl sulfide	$C_4H_{10}S$	899.9	878.1	855.5	836.7	807.4	754.6	694.7	623.0	523.6	681.7218	−323.6418	640.5198	−212.6743
Thiophene	C_4H_4S		1115.5	1087.6	1064.7	1029.1	965.9	896.1	815.7	714.2	669.4387	34.8407	278.2567	−4.5806
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	818.4	755.0	678.8	599.2						579.2311	238.0353	7.7800	65.3812
Difluoromethane (R32)	CH_2F_2	1208.7	1135.8	1054.9	980.9	839.4					895.2753	224.1922	−50.9228	229.6600
Trifluoromethane (R23)	CHF_3	1307.4	1188.8	1031.1	808.2						640.3526	2164.8814	−3066.7802	1825.7135
Tetrafluoromethane (R14)	CF_4	930.7									1095.6241	429.5476	−317.3820	397.1853
Methyl chloride	CH_3Cl	1051.8	1008.6	962.6	923.3	858.4	722.0				811.5515	−235.2020	591.6820	−153.4405
Methylene chloride	CH_2Cl_2	1451.9	1408.7	1363.9	1326.8	1268.6	1162.4	1037.2	867.4		937.7851	96.8605	196.4483	106.8482
Chloroform	$CHCl_3$	1613.5	1571.7	1528.2	1492.2	1435.6	1332.8	1214.1	1065.8	819.4	1175.1441	−347.5847	842.3866	−239.1385
Carbon tetrachloride	CCl_4			1629.5	1593.3	1536.9	1435.9	1322.4	1186.8	997.6	1168.4410	−175.3077	535.7568	−28.0071
Bromomethane	CH_3Br	1857.1	1795.2	1730.5	1676.2	1589.8	1425.3	1208.8			1295.9529	−43.9173	439.6850	35.7205
Dibromomethane	CH_2Br_2	2663.5	2604.8	2544.3	2494.6	2417.6	2281.2	2131.8	1963.3	1762.6	1922.8847	−620.7007	1443.7506	−392.2980
Tribromomethane	$CHBr_3$				2889.3	2811.7	2677.1	2534.4	2381.4	2213.8	1813.5394	−117.4543	1179.3409	−192.4309
Tetrabromomethane	CBr_4						2966.4	2821.7	2668.8	2504.7	1925.6988	207.2291	370.8863	404.8231
Chlorodifluoromethane (R22)	$CHClF_2$	1435.3	1361.3	1281.2	1210.1	1083.1					904.1321	874.1686	−1176.1342	881.0060
Dichlorofluoromethane (R21)	$CHCl_2F$	1536.1	1483.2	1427.5	1380.5	1304.7	1157.1	946.9			1070.5872	−98.6131	523.2526	−85.7030
Chlorotrifluoromethane (R13)	$CClF_3$	1393.0	1271.2	1116.7	922.9						1180.7265	−216.9828	745.9367	−183.8510
Dichlorodifluoromethane (R12)	CCl_2F_2	1544.9	1472.7	1395.4	1328.3	1213.0	903.1				914.8406	994.9276	−1324.3128	961.0344
Trichlorofluoromethane (R11)	CCl_3F	1646.4	1591.1	1534.3	1487.3	1413.4	1275.1	1095.0			851.6332	1187.6894	−1625.7708	1135.7392
Ethyl fluoride (R161)	C_2H_5F	835.4	798.6	757.8	721.4	656.3	420.3				871.5416	−639.9577	872.5932	−320.7747
Ethyl chloride	C_2H_5Cl	992.5	959.8	925.3	896.1	849.3	759.2	637.4			856.3593	−570.9783	973.9418	−348.5034

Ethyl bromide	C_2H_5Br	1598.9	1550.4	1500.0	1458.1	1392.2	1271.2	1127.1	926.4		1073.9100	−116.4739	607.8587	−92.9976
1,1-Dichloroethane	$C_2H_4Cl_2$	1277.7	1242.6	1206.2	1175.9	1128.4	1041.7	940.7	810.5		885.9945	−205.7961	614.0614	−155.3254
1,2-Dichloroethane	$C_2H_4Cl_2$		1317.1	1282.4	1253.7	1209.0	1129.1	1039.6	934.1	793.0	822.5207	−75.2915	548.0378	−126.6480
1,2-Dibromoethane	$C_2H_4Br_2$				2175.0	2115.7	2011.9	1900.3	1777.7	1638.1	1450.4550	59.2274	351.5599	106.9717
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	1174.5	1103.5	1023.8	950.2	803.5					889.8086	159.4135	−27.5628	218.1093
1,1,1-Trichloroethane	$C_2H_3Cl_3$		1408.1	1369.8	1338.1	1288.4	1198.9	1096.9	972.9	787.9	966.6160	−230.0350	721.5753	−197.3209
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$		1662.9	1626.3	1596.2	1549.9	1468.8	1381.5	1285.7	1176.8	1072.7673	−212.8525	808.8989	−195.6070
Pentachloroethane	C_2HCl_5		1742.5	1709.4	1681.8	1638.7	1561.9	1478.1	1386.3	1284.0	2495.1281	−4923.0789	6727.3035	−2845.4099
Hexachloroethane	C_2Cl_6								1619.7	1506.3	1430.9034	−692.7360	1783.3601	−734.5438
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$					1595.1	1487.3	1364.7	1216.7	1004.3	1175.4506	−180.3605	754.7753	−196.5778
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		1677.7	1622.0	1575.8	1503.1	1368.5	1201.9	924.6		1218.9337	135.4996	−143.7455	397.6751
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	1661.5	1597.8	1529.4	1470.5	1373.1	1168.4				1357.5613	−783.4204	1599.8675	−650.4350
1-Chloropropane	C_3H_7Cl	971.9	944.1	915.1	890.9	852.7	782.1	697.4	577.9		731.5526	−294.7994	610.0420	−179.1843
1-Chlorobutane	C_4H_9Cl	960.0	934.4	908.1	886.4	852.4	791.0	720.2	631.7		364.8430	899.0805	−876.2568	472.1917
1-Chloropentane	$C_5H_{11}Cl$	946.7	924.3	901.2	882.2	852.5	799.4	740.0	669.8	576.5	655.9881	−103.0953	303.1006	−33.1451
Chlorotrifluoroethene	C_2ClF_3	1539.5	1459.1	1372.2	1296.3	1166.0					1045.3953	−51.8354	734.1349	−161.2374
Vinyl chloride	C_2H_3Cl	1020.4	983.8	944.8	911.5	857.0	746.4				845.5168	−410.8391	753.8048	−252.5094
1,1-Dichloroethene	$C_2H_2Cl_2$	1332.2	1292.3	1250.5	1215.4	1159.3	1053.3	919.2			1069.3566	−480.9307	903.7241	−294.1212
Trichloroethene	C_2HCl_3	1573.0	1535.3	1496.3	1464.1	1413.9	1324.2	1223.9	1106.9	955.9	1044.2371	−345.2637	975.1438	−317.8707
Tetrachloroethene	C_2Cl_4			1652.0	1621.0	1573.4	1489.9	1399.9	1300.4	1185.7	706.7100	340.6747	313.2121	−0.4034
Fluorobenzene	C_6H_5F		1077.0	1048.5	1025.2	989.1	925.2	854.0	769.7	653.4	714.7826	136.3923	−139.1048	267.2267
Chlorobenzene	C_6H_5Cl		1150.6	1125.8	1105.6	1074.3	1019.6	960.3	894.7	818.5	780.6202	−22.5318	178.8073	71.8433
Bromobenzene	C_6H_5Br		1548.7	1518.4	1493.6	1455.3	1388.3	1316.2	1237.3	1148.7	1089.0319	−346.8409	823.6222	−233.4489
Iodobenzene	C_6H_5I		1892.9	1858.3	1830.2	1787.1	1712.5	1633.7	1549.3	1457.4	1226.0761	−102.2072	516.6255	−13.8056
m-Chlorotoluene	C_7H_7Cl			1091.3	1072.2	1042.9	992.1	938.0	879.3	813.5	768.5321	−122.6643	283.8313	52.6685
Benzyl chloride	C_7H_7Cl		1142.6	1119.9	1101.3	1072.8	1023.1	970.1	912.7	849.0	691.0301	23.2005	325.7146	−44.8929
***n*-Alkanes**														
Methane	CH_4										267.8594	129.3958	−73.6070	69.9714
Ethane	C_2H_6	491.5	451.3	400.5							339.4205	278.1378	−326.5550	246.5842
Propane	C_3H_8	589.8	560.3	528.3	500.0	449.2					373.2481	324.1771	−431.6048	327.5258
n-Butane	C_4H_{10}	652.0	626.9	600.6	578.4	542.1	467.3				418.6986	246.8434	−317.6272	274.8875
n-Pentane	C_5H_{12}	691.0	668.3	644.9	625.6	595.0	537.4	460.4			331.1104	681.0817	−965.3279	602.3613
n-Hexane	C_6H_{14}	721.8	699.9	677.6	659.4	631.1	580.3	520.8	437.7		537.3940	87.8728	−283.3888	344.5049
n-Heptane	C_7H_{16}	742.1	721.4	700.6	683.7	657.9	612.5	561.2	496.3		308.4582	1071.6860	−1664.6321	990.2540
n-Octane	C_8H_{18}	758.0	738.2	718.3	702.3	677.8	635.3	588.6	533.4	457.1	314.7545	1031.5341	−1576.7740	940.0026
n-Nonane	C_9H_{20}	772.4	753.2	733.9	718.2	694.4	653.4	609.5	560.1	499.2	438.9742	485.2660	−813.4139	597.9116

D3.1. Table 2. (continued)

Substance	Formula	Temperature (°C)									Equation (1)			
		−50	−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*
n-Decane	$C_{10}H_{22}$		764.9	745.8	730.4	707.1	667.4	625.4	579.1	524.3	309.6055	987.2944	−1482.3904	909.4231
n-Undecane	$C_{11}H_{24}$		771.4	754.3	740.2	718.6	680.6	639.6	594.4	542.6	507.1171	−85.9952	339.0114	−73.5121
n-Dodecane	$C_{12}H_{26}$			761.9	748.3	727.4	690.9	651.7	608.6	560.0	444.4040	138.4886	69.0787	37.5477
n-Tridecane	$C_{13}H_{28}$			771.2	757.2	735.7	698.4	658.7	615.8	568.4	448.8395	22.4550	270.4767	−35.9422
n-Tetradecane	$C_{14}H_{30}$				762.8	742.3	706.6	668.9	628.4	584.0	463.1763	−2.7765	279.4555	−36.6553
n-Pentadecane	$C_{15}H_{32}$				767.9	747.8	712.9	676.0	636.7	593.8	455.5302	11.7043	271.6956	−32.9927
n-Hexadecane	$C_{16}H_{34}$				772.6	753.0	719.0	683.2	645.0	603.6	452.8468	−20.7559	361.8764	−90.6718
n-Heptadecane	$C_{17}H_{36}$					757.2	723.9	688.9	651.8	611.9	447.6449	26.3796	258.9645	−26.2511
n-Octadecane	$C_{18}H_{38}$					759.4	727.5	693.7	657.8	619.0	463.0348	−70.7347	461.9766	−157.7468
n-Nonadecane	$C_{19}H_{40}$					765.4	732.9	698.8	662.9	624.5	444.3944	16.7270	294.2676	−43.2837
n-Eicosane	$C_{20}H_{42}$					768.7	736.3	702.6	667.2	629.6	432.7631	133.9129	81.0102	76.9690
Isoalkanes														
Isobutane	C_4H_{10}	634.5	608.3	580.5	556.7	517.3	429.8				383.6237	363.6942	−483.9167	353.6428
2-Methyl butane	C_5H_{12}	686.9	663.6	639.5	619.6	588.0	527.8	444.4			361.5111	560.1453	−819.7357	546.2874
2,2-Dimethyl propane	C_5H_{12}			611.1	590.0	555.4	484.3	360.6			399.8287	153.5783	29.4362	2.5978
2-Methyl pentane	C_6H_{14}	715.3	693.4	671.1	652.8	624.5	573.0	510.5			341.4133	769.6707	−1184.6190	747.5074
3-Methyl pentane	C_6H_{14}	722.8	703.0	682.3	665.1	637.7	586.9	525.5	438.2		573.2071	−229.0097	414.0510	−118.6548
2,2-Dimethyl butane	C_6H_{14}	710.4	689.3	667.3	648.9	619.8	565.2	497.6			486.0676	−45.2379	223.2189	−32.0169
2,3-Dimethyl butane	C_6H_{14}	721.0	699.8	678.3	660.6	633.1	582.6	520.3	422.9		254.1215	1135.4205	−1652.2629	932.1970
Olefins														
Ethylene	C_2H_4	480.6	426.7								364.3614	211.7762	−203.5475	188.4411
Propylene	C_3H_6	611.6	579.2	544.1	512.9	456.3					369.7127	440.5724	−608.9598	438.0705
1-Butene	C_4H_8	673.9	646.3	617.7	593.7	554.8	473.7				375.1257	531.6721	−821.5718	584.8143
1-Pentene	C_5H_{10}	711.9	687.8	662.5	641.4	607.7	543.6	459.0			498.6016	−53.1963	229.8900	−12.1005
1-Hexene	C_6H_{12}	737.9	716.0	693.1	674.1	644.2	589.1	523.4	432.1		510.1814	−116.4131	367.6914	−90.9801
1-Heptene	C_7H_{14}	755.9	736.1	715.7	698.7	672.1	623.8	568.4	499.8	388.8	532.8059	−176.2433	442.2244	−133.5518
1-Octene	C_8H_{16}	767.8	749.6	730.8	715.2	690.8	647.0	597.8	540.3	464.9	657.1207	−575.9768	946.0894	−359.8622
Propadiene	C_3H_4	683.0	651.2	617.0	587.3	537.2	419.7				502.0141	−158.5711	487.7855	−166.4310
1,2-Butadiene	C_4H_6	731.3	704.1	675.6	651.6	613.2	539.6	438.3			470.2546	−43.2316	338.1675	−71.5782
1,3-Butadiene	C_4H_6	701.7	674.9	646.4	621.9	581.9	499.5				516.9714	−153.0729	432.6257	−146.9736
1,2-Pentadiene	C_5H_8	758.1	735.6	712.2	692.6	661.8	604.8	536.3	438.0		526.0862	−102.9607	338.7486	−76.0606
trans-1,3-Pentadiene	C_5H_8	741.6	719.1	695.6	676.0	645.0	587.6	518.8			459.5187	−71.6617	434.8700	−156.7892

1,4-Pentadiene	C_5H_8	746.1	716.2	685.4	660.0	620.2	547.7	460.8			372.0249	140.8959	213.7531	36.0847
2,3-Pentadiene	C_5H_8	761.7	738.8	715.0	695.1	663.5	604.9	533.7	428.2		601.3221	−231.5055	468.4758	−132.5235
Acetylene and derivatives														
Acetylene	C_2H_2	567.0	521.0	464.7	401.2						522.9178	−240.7307	475.3756	−144.5991
Propyne	C_3H_4	704.7	674.5	642.2	614.2	567.4	462.0				534.1335	−75.2467	252.8497	−31.8209
2-Butyne	C_4H_6		737.9	712.4	691.0	657.0	592.5	509.1	268.3		586.6064	−155.7016	326.9444	−53.3841
1-Butyne	C_4H_6	732.3	705.7	677.7	654.0	615.6	539.8	422.6			503.9674	−90.2536	337.8005	−80.7264
Naphthenes														
Cyclopropane	C_3H_6	700.7	670.3	637.7	609.4	561.9	453.1				509.4024	−123.2450	381.1163	−107.6052
Cyclobutane	C_4H_8	757.3	735.9	713.3	694.0	662.8	601.4	514.7			710.5761	−476.8125	625.0484	−214.8659
Cyclopentane	C_5H_{10}	810.3	787.9	765.2	746.5	717.6	665.2	602.6	513.3		450.0150	692.7447	−1131.7809	724.4630
Methyl cyclopentane	C_6H_{12}	810.6	789.4	767.4	749.2	720.5	668.5	608.5	533.1		586.1851	−206.8126	465.6426	−133.2315
Ethyl cyclopentane	C_7H_{14}	821.9	802.8	783.0	766.7	741.3	695.7	644.5	584.1	504.2	591.7101	−161.9096	367.1965	−85.7409
Propyl cyclopentane	C_8H_{16}	829.4	811.2	792.5	777.0	753.0	710.2	662.9	608.9	542.7	599.4701	−246.4926	524.2674	−166.6909
Butyl cyclopentane	C_9H_{18}	836.4	818.5	800.2	785.2	761.9	721.0	676.4	626.5	568.1	549.8797	−94.1561	328.1468	−64.8716
Pentyl cyclopentane	$C_{10}H_{20}$		825.6	806.5	791.1	767.5	726.7	683.3	635.8	581.5	21.3865	1705.0458	−1919.0378	944.3151
Hexyl cyclopentane	$C_{11}H_{22}$			811.3	796.4	773.8	734.6	693.2	648.4	598.5	496.4226	118.3606	−44.5909	170.4166
Cyclohexane	C_6H_{12}				778.8	749.9	699.5	643.8	577.0	478.9	373.9221	848.7461	−1261.1653	815.8631
Methyl cyclohexane	C_7H_{14}	827.2	807.2	786.7	769.8	743.5	696.6	644.4	583.6	504.8	541.8145	−87.5463	328.4257	−63.2825
Ethyl cyclohexane	C_8H_{16}	840.1	821.9	803.3	788.0	764.3	722.3	676.4	624.5	562.4	577.6869	−104.1979	295.7576	−43.8897
Propyl cyclohexane	C_9H_{18}	845.3	827.3	809.0	794.0	770.9	730.4	686.9	638.9	584.1	496.0892	31.4274	199.9535	−0.0783
Butyl cyclohexane	$C_{10}H_{20}$	848.1	831.1	813.7	799.5	777.6	739.4	698.5	654.2	604.6	506.3817	−49.6664	336.9189	−68.8765
Pentyl cyclohexane	$C_{11}H_{22}$			811.2	796.5	773.8	734.8	693.4	648.6	598.5	279.5792	762.8400	−746.6601	440.9901
Hexyl cyclohexane	$C_{12}H_{24}$			821.2	807.1	785.6	748.3	708.8	666.4	620.1	593.6577	−303.4227	620.1121	−164.7850
Cyclopentene	C_5H_8	842.1	818.4	793.6	772.9	739.9	679.0	606.7	509.5		725.9817	−741.6349	1302.8902	−550.8221
Cyclohexene	C_6H_{10}	873.1	851.8	829.8	811.7	783.3	732.4	675.1	606.9	514.2	599.5856	−158.4142	433.0116	−115.8632
Aromatic compounds														
Benzene	C_6H_6				877.7	847.1	792.9	732.4	660.4	560.5	502.4341	531.5980	−663.9865	469.5949
Toluene	C_7H_8	931.9	909.1	886.0	867.4	839.0	789.7	736.5	676.0	600.3	439.5835	839.1558	−1234.8445	797.8741
Ethyl benzene	C_8H_{10}	927.5	906.1	884.6	867.2	840.7	795.0	746.4	692.8	629.6	570.2499	385.5562	−683.9919	559.6340
Propyl benzene	C_9H_{12}	920.6	899.9	879.3	862.8	838.0	796.2	752.6	705.4	650.5	374.7765	1406.9407	−2323.0960	1383.0818
Butyl benzene	$C_{10}H_{14}$	915.2	896.3	876.9	861.1	836.8	794.3	748.9	699.4	643.8	567.3503	−44.2239	325.9459	−48.9536
Pentyl benzene	$C_{11}H_{16}$	907.1	890.1	872.6	858.3	836.3	797.9	756.7	711.8	661.8	625.0808	−192.5173	472.6577	−129.2587
Hexyl benzene	$C_{12}H_{18}$	906.9	889.8	872.4	858.2	836.4	798.6	758.3	714.9	667.2	560.4851	−87.4540	385.4265	−85.5450
o-Xylene	C_8H_{10}		915.6	896.0	879.8	854.7	810.5	762.3	708.5	646.1	676.6371	−299.1691	624.5571	−201.7643
m-Xylene	C_8H_{10}		900.8	880.6	864.0	838.3	792.9	743.3	687.6	622.0	670.0403	−300.7884	613.6168	−189.3359

D3.1. Table 2. (continued)

Substance	Formula	Temperature (°C)									Equation (1)			
		−50	−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*
p-Xylene	C_8H_{10}				860.6	835.0	789.6	739.9	684.0	618.1	660.6795	−279.7896	602.8083	−192.6478
1,2,3-Trimethyl benzene	C_9H_{12}		925.3	908.3	894.3	872.6	834.4	792.9	747.1	695.1	754.5071	−413.8427	666.3695	−223.9630
1,2,4-Trimethyl benzene	C_9H_{12}		911.6	892.2	876.4	852.0	809.4	763.6	713.1	655.6	578.6385	85.6763	66.0157	76.6911
1,3,5-Trimethyl benzene	C_9H_{12}		900.5	881.3	865.5	841.0	798.0	751.4	699.7	640.0	640.9570	−176.3320	437.2828	−109.0875
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$			919.6	905.0	882.5	843.0	800.5	754.3	703.0	673.8483	−377.2864	846.4842	−333.8113
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$			905.7	890.5	867.1	826.3	782.7	735.3	682.6	608.7104	−85.1256	355.8065	−66.4080
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$						823.0	781.8	736.6	685.8	716.4977	−373.2590	668.4023	−225.6822
Pentamethyl benzene	$C_{11}H_{16}$				917.1	894.2	854.5	812.5	767.5	718.4	613.3655	−145.7886	514.0054	−142.3577
Hexamethyl benzene	$C_{12}H_{18}$								803.3	763.8	856.0941	−710.6638	1125.6113	−483.2720
Styrene	C_8H_8		944.7	923.2	905.5	878.3	830.6	779.2	722.7	658.1	596.1525	−108.0248	457.6070	−104.3199
Isopropyl benzene	C_9H_{12}	918.8	899.2	879.1	862.6	837.3	792.8	744.8	691.7	630.2	612.6486	−67.4355	255.7468	2.0865
Biphenyl	$C_{12}H_{10}$						969.4	929.7	888.7	845.5	−144.5769	3294.2798	−4370.6493	2181.5445
Diphenyl methane	$C_{13}H_{12}$					983.6	945.6	905.4	862.5	816.1	721.9528	−259.8678	651.0631	−218.7731
Triphenyl methane	$C_{19}H_{16}$						1011.7	976.3	939.4	900.7	658.1058	−42.5371	332.2151	−26.7722
Tetraphenyl methane	$C_{25}H_{20}$										858.8627	−205.4402	780.2431	−214.3411
Naphthalene	$C_{10}H_8$						963.6	922.0	877.5	829.2	827.8845	−650.9380	1177.1336	−454.2853
1-Methylnaphthalene	$C_{11}H_{10}$		1052.3	1034.7	1020.4	998.4	960.5	920.7	878.6	833.4	731.0545	−216.5763	499.7559	−106.6647
2-Methylnaphthalene	$C_{11}H_{10}$			1018.5	1004.1	982.2	944.5	905.1	863.4	818.8	812.2186	−440.4793	644.4363	−123.2879
1-Ethylnaphthalene	$C_{12}H_{12}$			1021.1	1007.7	987.3	952.0	914.9	875.4	833.0	768.0808	−208.0320	385.7996	−59.6192
2-Ethylnaphthalene	$C_{12}H_{12}$			1005.5	992.4	972.1	937.1	900.1	860.8	818.4	762.4014	−281.5464	517.9806	−131.1086
Alcohols														
Methanol	CH_4O	857.7	834.1	810.5	791.5	762.4	710.1	646.4	549.4		164.7611	2257.7678	−3545.6923	1929.7376
Ethanol	C_2H_6O	842.2	824.9	806.2	790.2	763.9	712.9	648.1	554.9		748.6170	−412.3622	776.4394	−436.6757
1-Propanol	C_3H_8O	860.7	841.5	821.3	804.5	777.9	729.1	671.6	597.9		816.2709	−549.2099	696.9841	−232.0820
1-Butanol	$C_4H_{10}O$	862.9	844.4	825.2	809.3	784.3	738.9	687.1	624.4	536.7	777.2534	−446.8420	578.8813	−172.9538
1-Pentanol	$C_5H_{12}O$	866.9	849.3	831.0	815.9	792.2	749.5	701.4	644.9	572.7	751.4379	−445.8311	657.1566	−231.1445
1-Hexanol	$C_6H_{14}O$		850.4	833.5	819.5	797.6	758.4	714.9	665.1	604.5	779.5145	−533.7565	743.6153	−264.3245
1-Heptanol	$C_7H_{16}O$		855.8	837.8	823.1	800.3	760.0	716.0	667.0	609.9	637.2821	−224.8073	464.7011	−131.7231
1-Octanol	$C_8H_{18}O$			841.1	826.8	804.6	765.4	722.9	676.0	622.6	635.0506	−325.7666	688.5827	−254.0193
Isopropanol	C_3H_8O	845.4	825.4	804.3	786.5	758.0	704.4	638.5	544.2		865.9165	−744.0943	975.9052	−381.1278
2-Methyl-1-propanol	$C_4H_{10}O$	854.8	836.9	817.9	801.9	776.4	729.1	673.7	605.3	503.1	934.7519	−1180.1957	1728.8821	−777.3781
3-Methyl-1-butanol	$C_5H_{12}O$	858.5	842.2	825.2	811.0	788.7	748.1	701.7	646.1	572.0	879.1766	−733.0487	895.9805	−330.6835
Ethylene glycol	$C_2H_6O_2$			1127.2	1113.5	1092.3	1054.7	1013.9	969.1	919.0	1305.5931	−1374.2561	1691.0501	−665.0358

1,3-Propylene glycol	$C_3H_8O_2$		1079.0	1064.4	1052.4	1033.9	1001.5	966.7	928.8	886.6	1122.4836	−875.9683	844.9680	−234.3532
Glycerol	$C_3H_8O_3$				1261.0	1241.6	1208.0	1172.3	1134.3	1093.5	1341.5932	−1168.2050	1429.7634	−527.7710
Cyclohexanol	$C_6H_{12}O$					925.4	880.1	831.0	776.9	715.2	691.7418	−231.6456	571.5227	−175.7843
Benzyl alcohol	C_7H_8O			1061.0	1046.0	1022.8	982.4	939.3	892.7	841.5	850.4338	−421.4897	717.9510	−227.4262
Phenols														
o-Cresol	C_7H_8O					1021.9	979.2	933.9	885.2	831.7	632.5598	−17.3349	263.1021	0.0173
m-Cresol	C_7H_8O				1033.7	1011.1	971.7	929.5	883.7	832.9	789.9775	−285.5601	515.7326	−142.1040
p-Cresol	C_7H_8O					1011.3	971.7	929.7	884.5	834.9	622.7984	36.9513	126.9550	56.8974
Phenol	C_6H_6O					1050.1	1005.6	958.3	907.3	851.1	572.3325	39.7056	345.4050	−72.2556
Carboxylic acids														
Formic acid	CH_2O_2				1220.1	1182.6	1115.5	1040.4	953.0	842.3	1181.5822	−735.7666	1040.1334	−334.6213
Acetic acid	$C_2H_4O_2$				1048.0	1016.2	959.9	897.7	826.2	736.6	925.3897	−312.7993	340.0633	29.7204
Propionic acid	$C_3H_6O_2$			1012.2	992.6	962.4	908.6	849.3	781.6	699.1	797.1701	−247.0129	471.4726	−96.1474
Butyric acid	$C_4H_8O_2$			974.4	956.9	929.8	882.2	830.4	772.3	702.9	863.4643	−339.3183	323.8065	40.4813
Valeric acid	$C_5H_{10}O_2$		969.7	949.7	933.3	907.6	862.0	812.2	756.4	691.7	783.8282	−574.7117	1043.4452	−417.5824
Caproic acid	$C_6H_{12}O_2$			937.3	922.8	900.1	860.0	816.3	767.6	712.0	864.3467	−628.7969	947.6116	−358.8242
Acetic anhydride	$C_4H_6O_3$	1162.4	1134.3	1105.4	1081.7	1045.1	980.4	910.0	831.3	738.6	682.0673	−119.7326	679.5899	−205.8780
Propionic anhydride	$C_6H_{10}O_3$		1058.0	1032.3	1011.1	978.5	921.3	859.4	791.0	712.3	634.5554	−111.1548	605.3432	−170.7870
Chloroacetic acid	$C_2H_3ClO_2$						1320.5	1250.1	1174.0	1089.7	997.2610	−242.9622	764.1551	−197.3080
Dichloroacetic acid	$C_2H_2Cl_2O_2$				1561.4	1515.8	1436.9	1353.7	1264.6	1167.5	835.2438	125.7524	573.8920	−58.3985
Trichloroacetic acid	$C_2HCl_3O_2$						1542.5	1461.3	1374.0	1277.8	1051.8830	−25.9784	525.2987	−32.4824
Ketones														
Ketene	C_2H_2O	793.4	753.2	709.1	669.9	600.5					622.1840	−165.9732	442.6230	−119.5770
Acetone	C_3H_6O	865.8	839.7	812.9	790.8	756.2	693.3	619.0	516.3		547.3820	208.7420	−203.7599	253.9936
Methyl ethyl ketone	C_4H_8O	877.4	852.5	826.7	805.3	771.9	711.7	643.1	558.8		560.7857	−90.7312	454.3929	−120.5211
Diethyl ketone	$C_5H_{10}O$		857.3	833.8	814.5	784.3	730.1	669.3	597.3	500.2	631.4702	−197.4050	514.5685	−146.1064
Dipropyl ketone	$C_7H_{14}O$		855.2	833.9	816.4	789.4	741.8	689.7	631.1	560.9	550.0551	−47.0791	332.7349	−55.1781
Acetophenone	C_8H_8O				1027.7	1002.3	958.2	911.4	860.9	805.7	729.4145	−204.6406	556.0093	−145.9565
Benzophenone	$C_{13}H_{10}O$					1083.3	1045.9	1007.0	966.4	923.5	782.3121	−159.9513	358.9665	−0.1287
Ethers														
Dimethyl ether	C_2H_6O	764.6	731.2	695.4	664.4	612.4	494.3				493.6395	92.1379	137.7856	5.8434
Diethyl ether	$C_4H_{10}O$	794.9	766.5	737.5	713.7	676.5	607.7	518.6			521.2805	257.7528	−489.2726	486.7458
Dipropyl ether	$C_6H_{14}O$	806.5	785.9	764.5	746.8	718.9	668.1	609.1	533.7		560.6008	−66.0979	231.3743	−25.4168
Methyl propyl ether	$C_4H_{10}O$	804.4	777.7	749.8	726.5	689.5	620.3	533.2			519.3865	−39.7274	321.5971	−58.9568
Ethyl propyl ether	$C_5H_{12}O$	798.7	774.9	750.0	729.3	696.7	636.5	564.3	461.2		556.9149	−128.7853	384.7507	−88.7772
Ethylene oxide	C_2H_4O	963.3	932.8	900.7	873.6	830.3	747.5	638.5			757.9994	−286.5638	583.1649	−177.0206
Furane	C_4H_4O	1027.4	996.9	964.9	938.1	895.4	815.3	715.8	557.5		874.7486	−463.4642	800.9808	−268.1611

D3.1. Table 2. (continued)

Substance	Formula	Temperature (°C)									Equation (1)			
		−50	−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*
1,4-dioxane	$C_4H_8O_2$				1033.2	999.8	940.4	874.6	799.1	705.7	678.8964	−120.4207	544.3169	−167.1524
Aldehydes														
Formaldehyde	CH_2O	865.3	823.7	779.8	742.3	680.8	549.5				625.7638	5.7090	245.3425	43.9601
Acetaldehyde	C_2H_4O	866.9	837.4	806.5	780.6	739.4	661.2	558.6			588.8420	−39.6103	285.7658	−26.6228
Paraldehyde	$C_6H_{12}O_3$				993.9	959.1	898.2	831.9	756.5	662.3	560.5579	264.0982	−148.6559	262.2179
Furfural	$C_5H_4O_2$		1204.7	1179.9	1159.7	1128.5	1074.1	1016.0	952.7	882.1	747.7699	−99.6602	513.8809	−116.7313
Benzaldehyde	C_7H_6O	1103.7	1083.1	1062.1	1045.0	1018.7	973.0	924.3	871.7	813.7	696.5787	−30.8195	301.9063	−22.2959
Salicylaldehyde	$C_7H_6O_2$				1153.1	1127.9	1083.2	1034.6	980.7	919.5	1156.0689	−926.0141	1233.5363	−464.4392
Esters														
Methyl formate	$C_2H_4O_2$	1069.3	1036.8	1002.8	974.3	929.2	844.6	739.7			775.1812	−197.0272	529.3064	−138.9492
Ethyl formate	$C_3H_6O_2$	1005.1	976.6	946.8	922.1	882.9	810.8	725.0	607.9		765.9448	−360.7128	737.2408	−242.8289
Propyl formate	$C_4H_8O_2$	979.3	953.8	927.3	905.4	871.0	808.7	737.0	648.0		695.5638	−166.9122	452.1853	−110.8676
Methyl acetate	$C_3H_6O_2$	1019.0	989.7	959.4	934.1	894.2	820.7	732.9	610.5		735.8282	−133.1048	374.1594	−55.0194
Ethyl acetate	$C_4H_8O_2$	977.3	950.7	923.1	900.1	864.1	798.2	720.9			660.3752	8.8513	207.1680	1.5101
Propyl acetate	$C_5H_{10}O_2$	958.5	934.1	908.7	887.8	855.1	796.1	729.2	648.0	530.1	682.4676	−162.2018	432.6427	−97.3592
Methyl propionate	$C_4H_8O_2$	990.9	964.5	937.1	914.4	878.8	814.0	738.9	643.7		708.5713	−154.0179	420.6243	−90.1472
Ethyl propionate	$C_5H_{10}O_2$	960.6	935.8	910.1	888.8	855.5	795.4	726.9	643.4	518.9	693.9231	−209.9952	516.2012	−141.1864
Propyl propionate	$C_6H_{12}O_2$	948.9	925.7	901.7	881.9	851.1	796.1	734.7	662.7	568.3	632.5301	−108.1101	391.7953	−80.5204
Methyl butyrate	$C_5H_{10}O_2$	965.2	942.0	918.0	898.1	866.9	810.6	746.4	668.7	558.1	752.8912	−322.2388	595.9627	−181.6941
Ethyl butyrate	$C_6H_{12}O_2$	944.4	921.6	898.2	878.8	848.7	794.7	734.3	663.5	571.0	676.2305	−183.8280	454.1518	−110.2246
Methyl benzoate	$C_8H_8O_2$			1105.3	1087.7	1060.6	1012.8	961.5	905.6	843.4	884.1769	−486.5499	965.3906	−361.7121
Ethyl benzoate	$C_9H_{10}O_2$		1086.5	1064.6	1046.8	1019.4	971.8	921.2	866.7	806.8	733.0282	−164.2079	529.3259	−121.7958
Methyl salicylate	$C_8H_8O_3$			1198.6	1180.9	1153.7	1106.2	1055.5	1000.6	940.2	905.2883	−355.4925	695.0348	−203.3611
Amines														
Methyl amine	CH_5N	743.6	715.9	686.4	661.1	619.5	533.7				803.3522	−545.1488	695.6625	−211.9019
Ethyl amine	C_2H_7N	760.9	734.5	706.6	683.1	645.1	571.2	466.7			633.5210	−127.7781	267.0804	−30.4806
Propyl amine	C_3H_9N	784.1	761.9	738.6	719.1	687.9	629.5	557.5	448.6		743.8388	−508.9910	757.8672	−271.2439

n-Butyl amine	$C_6H_{15}N$		778.5	756.8	738.8	710.3	657.9	596.3	516.8		536.8539	99.8023	86.4297	−0.0872
Dimethyl amine	C_2H_7N	727.2	703.3	677.7	655.9	620.0	547.1	425.2			669.2053	−452.4323	686.3039	−257.5126
Trimethyl amine	C_3H_9N	712.5	686.2	658.3	634.5	595.7	517.1				595.8605	−277.4351	522.6859	−170.4614
Diethyl amine	$C_6H_{15}N$		750.1	726.5	706.9	675.7	617.5	546.4	440.0		587.2056	−154.6153	354.6121	−84.9548
Triethyl amine	$C_6H_{15}N$	787.9	767.4	746.1	728.4	700.8	650.6	592.9	520.8		527.4070	−73.2089	292.3398	−56.6226
Piperidine	$C_5H_{11}N$			879.5	862.2	835.2	787.0	733.4	671.8	596.1	715.9263	−375.9305	715.6680	−252.9803
Pyridine	C_6H_7N	1051.2	1027.6	1003.3	983.4	952.5	898.1	838.9	773.0	696.0	690.1939	−203.6045	639.6026	−197.2534
Aniline	C_6H_7N			1036.0	1020.1	995.7	953.4	908.4	859.9	806.4	658.6221	−14.6944	242.0930	0.7157
N-methyl aniline	C_7H_9N	1037.2	1019.4	1001.2	986.3	963.3	923.0	879.7	832.7	780.5	864.2138	−497.9953	785.4701	−259.5471
N,*N*-dimethyl aniline	$C_8H_{11}N$				954.9	932.4	892.6	849.7	802.5	749.4	947.8512	−688.2637	967.8765	−348.1476
N,*N*-diethyl aniline	$C_{10}H_{15}N$		967.5	949.2	934.3	911.4	871.5	829.0	783.2	732.6	741.1539	−219.0978	404.9792	−62.8648
Phenylhydrazine	$C_6H_8N_2$				1096.2	1072.3	1030.5	985.7	937.4	884.7	1059.0386	−909.0434	1516.7029	−633.0667
Diphenyl amine	$C_{12}H_{11}N$						1023.9	984.5	942.9	898.8	741.2921	−188.1027	546.9112	−136.8931
Nitriles														
Acetonitrile	C_2H_3N		828.1	802.7	781.8	749.2	690.9	625.2	546.2	430.3	565.3431	−36.8917	312.7935	−27.5047
Propionitrile	C_3H_5N	846.0	823.8	801.0	782.2	752.9	700.5	641.9	573.1	481.8	593.9656	−143.8921	437.8666	−106.4610
Butyronitrile	C_4H_7N	851.5	830.4	808.7	790.8	763.1	713.8	659.4	596.8	518.5	574.0426	−109.8505	395.2330	−87.6033
Benzonitrile	C_7H_5N			1021.7	1005.0	979.3	934.8	887.7	837.1	781.6	609.1142	−3.9828	337.9801	−43.7599
Amides														
Formamide	CH_3NO				1132.8	1107.4	1063.3	1016.7	967.1	913.7	965.0375	−531.0847	957.2988	−315.4745
Nitroderivates														
Nitromethane	CH_3NO_2		1191.9	1159.8	1133.4	1092.8	1021.5	943.5	854.9	745.7	675.9080	381.0708	−203.4493	278.9247
Nitrobenzene	$C_6H_5NO_2$				1203.2	1173.7	1122.4	1067.9	1009.5	945.7	902.6390	−421.4692	914.1481	−291.7604
o-Nitrotoluene	$C_7H_7NO_2$			1180.4	1162.6	1134.9	1085.5	1031.6	972.6	907.3	1144.0002	−1639.6486	2962.1530	−1405.4992
m-Nitrotoluene	$C_7H_7NO_2$				1158.1	1130.8	1083.5	1033.5	980.2	922.2	921.6086	−241.0428	446.4670	−40.2498
p-Nitrotoluene	$C_7H_7NO_2$						1080.0	1031.0	978.7	922.1	878.9128	−151.3942	353.3063	−0.4124

D3.1. Table 3. Boiling temperatures at different pressures in °C

Substance	Formula	Vapor pressure in mbar										Equation (7)			
		5	10	50	100	250	500	1,000	2,000	5,000	10,000	*A*	*B*	*C*	*D*
Elements															
xenon	Xe							−108.3	−95.3	−74.2	−54.5	−6.00659	1.37325	−0.77703	−1.22529
Krypton	Kr							−153.6	−144.0	−128.5	−114.0	−5.98396	1.34334	−0.66521	−1.30012
Argon	Ar							−186.0	−178.9	−167.4	−156.6	−5.92801	1.21982	−0.53967	−1.52312
Neon	Ne						−248.2	−246.1	−243.6	−239.5	−235.6	−5.74238	1.08860	−0.05896	−1.19851
Helium	He			−271.0	−270.7	−270.1	−269.6	−268.9	−268.1			−4.06856	1.04379	1.11594	0.08835
Air						−204.8	−200.0	−194.4	−187.8	−177.0	−167.0	−5.35069	−0.21537	0.93623	−3.02641
Hydrogen	H_2				−258.5	−256.6	−254.9	−252.8	−250.3	−246.0	−241.8	−4.83622	0.94200	0.76650	−0.47071
Nitrogen	N_2					−206.0	−201.3	−195.9	−189.5	−179.2	−169.4	−6.12498	1.26499	−0.76765	−1.78173
Oxygen	O_2	−214.6	−211.9	−204.4	−200.5	−194.5	−189.2	−183.1	−175.9	−164.3	−153.5	−6.05148	1.23506	−0.62883	−1.61288
Sulfur	S	211.7	232.1	287.9	316.6	360.3	398.8	443.3	495.5	579.7	657.9	−15.68872	19.60608	−12.56687	1.67046
Fluorine	F_2	−217.2	−214.7	−207.8	−204.2	−198.7	−193.8	−188.2	−181.7	−171.2	−161.4	−6.27045	1.53939	−1.25605	−1.27235
Chlorine	Cl_2			−85.8	−76.2	−61.7	−48.9	−34.3	−17.4	9.6	34.5	−6.43911	1.48278	−1.21184	−2.02926
Bromine	Br_2				2.4	21.9	38.9	58.3	80.8	116.5	149.1	−6.76024	1.50339	−0.64097	−3.62166
Iodine	I_2					134.5	157.5	183.8	214.3	262.8	307.5	−6.98158	2.33987	−1.48090	−3.73441
Anorganic compounds															
Hydrogen fluoride	HF		−75.2	−48.4	−35.2	−15.7	0.8	19.2	39.7	71.0	98.3	−9.73172	5.07747	−2.98832	5.51671
Hydrogen chloride	HCl					−106.5	−96.6	−85.3	−72.1	−51.2	−32.1	−6.63222	1.06066	0.05415	−4.45907
Hydrogen bromide	HBr						−79.4	−66.8	−52.4	−29.6	−8.7	−5.92115	0.77533	−1.67956	1.00212
Hydrogen iodide	HI						−50.5	−35.7	−18.6	8.8	34.0	−5.92123	0.95693	−1.04474	−1.03336
Hydrogen cyanide	HCN					−7.4	8.0	25.3	45.1	75.7	103.0	−9.77338	5.29679	−4.36059	1.58018
Water	H_2O		7.0	32.9	45.8	65.0	81.3	99.6	120.2	151.8	179.9	−7.86975	1.90561	−2.30891	−2.06472
Hydrogen sulfide	H_2S					−84.4	−73.3	−60.6	−45.9	−22.5	−1.1	−6.50342	1.52011	−1.36969	−1.96704
Ammonia	NH_3				−71.2	−58.0	−46.5	−33.6	−18.8	4.1	24.9	−7.30274	1.64638	−2.01606	−1.96884
Nitric oxide	NO						−157.6	−151.9	−145.4	−135.3	−126.2	−8.38772	0.85755	−3.11447	−8.98765
Nitrogen dioxide	NO_2					−6.2	6.8	20.9	36.4	59.3	78.7	−11.33898	2.37620	0.67820	−2.53997
Nitrous oxide	N_2O							−88.7	−76.2	−56.4	−38.2	−6.79599	1.59751	−1.85163	−2.29494
Dinitrogentetroxide	N_2O_4					−6.1	6.8	21.0	36.6	59.6	79.1	−11.71738	3.10196	0.59704	−5.33648
Cyanogen	C_2N_2							−21.4	−5.1	20.7	44.3	−7.51492	1.94916	−2.36750	−4.23472
Phosphorus trichloride	PCl_3	−35.6	−25.9	0.7	14.4	35.2	53.5	74.6	99.2	138.4	174.6	−8.83133	5.61883	−4.80318	−1.25347
Cyanogen chloride	ClCN						−3.9	12.5	30.9	59.3	84.9	−7.49333	1.78753	−4.04253	8.50574
Silane	SiH_4	−167.8	−163.1	−150.2	−143.4	−132.8	−123.3	−112.3	−99.2	−78.2	−58.9	−7.30552	2.71060	−0.09783	−4.71464
Tetrachlorosilane	$SiCl_4$	−47.9	−38.7	−13.3	−0.3	19.5	36.8	56.8	79.9	116.8	151.0	−6.60174	0.34409	−1.09066	−3.15050

Carbon monoxide	CO					−202.1	−197.2	−191.6	−185.0	−174.3	−164.2	−6.19574	1.32502	−0.95226	−1.98513
Carbon dioxide	CO_2										−40.1	−7.02916	1.53937	−2.28330	−2.34853
Carbon suboxide	C_3O_2	−82.8	−74.8	−53.1	−41.9	−25.1	−10.5	6.0	24.9	53.8	78.8	−13.34201	11.51312	−6.91741	−0.29406
Carbonyl sulfide	COS	−123.0	−116.6	−99.1	−90.1	−76.4	−64.3	−50.5	−34.3	−8.6	15.3	−6.51272	1.55373	−1.33074	−2.08761
Phosgene	CCl_2O	−80.1	−72.4	−51.3	−40.4	−23.9	−9.3	7.4	26.7	57.5	85.7	−6.82435	0.89402	−0.50281	−4.67598
Carbon disulfide	CS_2	−57.9	−48.8	−23.8	−10.9	8.7	26.0	45.8	68.8	105.2	138.5	−6.58802	1.03676	0.15875	−3.44094
Sulfur dioxide	SO_2			−61.9	−52.1	−37.5	−24.8	−10.3	6.3	32.5	56.3	−7.27858	1.72871	−2.37473	−2.70464
Sulfur trioxide	SO_3					19.6	31.1	44.2	59.5	84.1	107.3	−8.74717	6.32513	−13.93665	−9.67972
Sulfuryl chloride	Cl_2SO_2	−36.5	−27.0	−1.3	11.9	31.7	49.1	69.0	92.1	129.2	163.9	−6.32835	0.89929	−2.88437	−1.24330
Sulfur hexafluoride	SF_6									−29.8	−8.0	−7.08034	1.65103	−1.96365	−0.25060
Organic compounds containing sulfur															
Methyl mercaptan	CH_4S	−81.6	−73.8	−52.6	−41.8	−25.3	−10.9	5.7	24.9	55.7	84.3	−8.04229	4.64898	−4.38751	−1.03684
Ethyl mercaptan	C_2H_6S	−62.2	−53.6	−30.1	−18.0	0.3	16.3	34.7	55.9	89.7	120.8	−6.85400	1.41434	−1.74027	−2.40242
Dimethyl sulfide	C_2H_6S	−59.7	−51.2	−27.9	−15.9	2.4	18.5	37.0	58.5	92.9	124.6	−7.20168	1.99080	−1.67979	−3.99499
Diethyl sulfide	$C_4H_{10}S$	−23.6	−13.1	15.4	29.8	51.5	70.3	91.7	116.3	155.0	190.5	−6.90446	0.48320	−1.77018	−0.12336
Thiophene	C_4H_4S	−26.0	−16.3	10.2	23.8	44.6	62.8	83.8	108.1	147.0	182.8	−7.01021	1.63774	−1.66720	−4.21813
Halogenated hydrocarbons															
Fluoromethane (R41)	CH_3F	−140.5	−135.0	−120.0	−112.2	−100.5	−90.3	−78.6	−65.1	−43.7	−24.0	−7.21927	1.95643	−1.73271	−2.07627
Difluoromethane (R32)	CH_2F_2	−119.6	−113.5	−96.9	−88.5	−75.7	−64.6	−51.9	−37.3	−14.3	6.6	−7.47027	1.75595	−2.01429	−2.62147
Trifluoromethane (R23)	CHF_3	−141.6	−136.3	−121.8	−114.4	−103.2	−93.4	−82.3	−69.4	−49.1	−30.3	−7.38216	1.96234	−2.68392	−1.43178
Tetrafluoromethane (R14)	CF_4	−175.8	−171.6	−160.3	−154.4	−145.4	−137.4	−128.3	−117.6	−100.4	−84.6	−6.92188	1.54525	−1.41276	−2.87791
Methyl chloride	CH_3Cl		−96.2	−77.1	−67.3	−52.5	−39.4	−24.5	−7.1	20.4	45.7	−6.71862	1.27727	−0.96338	−3.14698
Methylene chloride	CH_2Cl_2	−56.3	−47.8	−24.5	−12.6	5.5	21.3	39.4	60.5	94.2	125.5	−7.57368	3.17104	−3.53296	−2.27696
Chloroform	$CHCl_3$	−41.8	−32.9	−8.2	4.5	23.9	41.0	60.7	83.6	120.0	153.4	−7.32485	1.69599	−0.93627	−5.89590
Carbon tetrachloride	CCl_4			2.1	15.8	36.7	55.1	76.3	101.0	140.5	177.1	−7.11728	1.96174	−2.05900	−3.26771
Bromomethane	CH_3Br	−84.4	−76.6	−55.3	−44.4	−27.8	−13.3	3.3	22.4	52.7	80.2	−7.65380	2.84555	−1.71564	−2.54232
Dibromomethane	CH_2Br_2	−16.0	−6.0	21.3	35.4	56.6	75.2	96.5	121.2	160.3	196.1	−7.25658	1.92921	−1.61527	−4.04404
Tribromomethane	$CHBr_3$	18.8	30.4	62.0	78.2	102.7	124.1	148.7	177.2	223.0	265.7	−7.16326	2.92794	−3.91279	−1.16341
Tetrabromomethane	CBr_4			95.2	111.8	137.8	161.3	188.8	220.6	269.5	310.6	−13.48480	9.03531	1.84773	−22.26830
Chlorodifluoromethane (R22)	$CHClF_2$	−113.5	−107.0	−89.5	−80.4	−66.8	−54.8	−41.1	−25.2	0.1	23.4	−7.09210	1.61905	−2.01221	−2.73123
Dichlorofluoromethane (R21)	$CHCl_2F$	−78.7	−70.9	−49.8	−39.0	−22.5	−8.1	8.5	27.7	58.3	86.7	−6.95944	1.53177	−1.97969	−3.25683
Chlorotrifluoromethane (R13)	$CClF_3$	−144.2	−138.7	−123.7	−115.9	−104.1	−93.7	−81.7	−67.7	−45.2	−24.4	−6.82801	1.52677	−1.75147	−2.23841
Dichlorodifluoromethane (R12)	CCl_2F_2	−108.7	−101.8	−82.9	−73.1	−58.3	−45.2	−30.1	−12.5	15.7	41.7	−6.92085	1.62615	−1.73939	−2.58282
Trichlorofluoromethane (R11)	CCl_3F	−71.6	−63.3	−40.4	−28.6	−10.7	5.1	23.3	44.4	78.2	109.4	−6.91946	1.52457	−1.66128	−2.85320
Ethyl fluoride (R161)	C_2H_5F	−113.2	−106.5	−88.2	−78.8	−64.6	−52.1	−38.0	−21.6	4.4	28.1	−7.07032	1.42577	−1.49199	−1.92623
Ethyl chloride	C_2H_5Cl	−78.2	−70.2	−48.3	−37.1	−20.1	−5.2	11.9	31.7	63.4	92.7	−7.36967	2.69543	−3.02790	−1.39375
Ethyl bromide	C_2H_5Br	−62.1	−53.0	−28.2	−15.7	3.1	19.5	38.1	59.5	93.7	125.1	−9.71666	7.74488	−7.76676	3.99427

D3.1. Table 3. (continued)

Substance	Formula	Vapor pressure in mbar										Equation (7)			
		5	10	50	100	250	500	1,000	2,000	5,000	10,000	*A*	*B*	*C*	*D*
1,1-Dichloroethane	$C_2H_4C_2H_4Cl_2$	−45.7	−36.5	−11.5	1.3	20.6	37.4	56.7	78.9	114.0	146.3	−6.63204	0.36053	−1.04822	−2.87286
1,2-Dichloroethane	$C_2H_4Cl_2$	−26.2	−16.4	10.2	23.8	44.4	62.5	83.2	107.2	145.1	179.8	−8.26850	3.49184	−3.19752	−2.97053
1,2-Dibromoethane	$C_2H_4Br_2$		17.5	47.9	63.4	86.8	107.4	131.0	158.4	202.3	243.1	−7.96068	4.07852	−4.74206	−0.88410
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$			−95.2	−86.4	−72.9	−61.1	−47.5	−31.8	−6.7	16.3	−7.35995	1.71203	−2.01879	−2.98413
1,1,1-Trichloroethane	$C_2H_3Cl_3$		−25.9	0.4	14.0	34.6	52.8	73.7	98.0	136.9	172.8	−7.21356	1.90482	−2.08892	−3.31006
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$	18.0	29.5	60.9	76.9	100.9	121.7	145.4	172.7	215.9	256.0	−5.60385	−1.82148	−0.70234	−1.88475
Pentachloroethane	C_2HCl_5	27.3	39.2	71.5	88.1	113.1	134.9	159.9	188.7	234.6	276.7	−7.59524	1.63691	−2.82337	−2.34305
Hexachloroethane	C_2Cl_6								215.1	265.9	313.7	−6.84574	1.14406	−2.27578	−7.15228
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$				31.2	52.5	71.1	92.6	117.5	157.4	194.5	−7.71309	2.64672	−3.98878	−1.66517
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$			−20.7	−8.1	11.0	27.8	47.2	69.8	105.9	139.3	−7.24399	1.63003	−2.12928	−3.49922
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	−84.9	−77.0	−55.6	−44.7	−28.1	−13.5	3.3	22.8	54.1	83.3	−7.64719	2.95529	−4.23671	0.15959
1-Chloropropane	C_3H_7Cl	−53.5	−44.7	−20.6	−8.2	10.7	27.2	46.1	68.2	103.3	135.7	−7.23105	1.89946	−2.29641	−2.86891
1-Chlorobutane	C_4H_9Cl	−30.6	−21.1	4.9	18.4	39.0	57.2	78.3	102.8	142.2	178.8	−6.77199	0.79529	−1.25773	−5.53709
1-Chloropentane	$C_5H_{11}Cl$	−11.5	−1.0	27.7	42.5	65.1	85.0	108.0	134.8	177.6	216.6	−9.45097	5.86945	−5.57003	−2.09598
Chlorotrifluoroethene	C_2ClF_3	−117.7	−108.5	−85.3	−74.1	−57.9	−44.3	−29.1	−11.8	15.5	40.7	−8.22217	4.87114	−7.47925	13.31070
Vinyl chloride	C_2H_3Cl	−96.2	−89.0	−69.2	−59.0	−43.5	−29.9	−14.1	4.3	33.8	61.3	−6.32153	1.11198	−1.35813	−3.25332
1,1-Dichloroethene	$C_2H_2Cl_2$	−63.4	−55.1	−32.4	−20.7	−2.8	13.0	31.3	52.8	87.5	119.4	−10.49400	9.03819	−7.79814	−1.10724
Trichloroethene	C_2HCl_3	−26.8	−16.6	11.2	25.3	46.4	64.8	85.7	109.9	148.4	184.2	−6.86463	1.75400	−3.57287	0.95588
Tetrachloroethene	C_2Cl_4	−2.1	8.9	39.0	54.3	77.4	97.6	120.6	147.1	189.5	228.8	−6.50488	0.75823	−2.53992	−0.58809
Fluorobenzene	C_6H_5F	−26.8	−16.8	10.5	24.4	45.4	63.8	84.8	109.1	147.8	183.5	−7.42663	2.30457	−3.23481	−1.05236
Chlorobenzene	C_6H_5Cl	5.6	16.8	47.5	63.2	86.9	107.7	131.4	159.0	202.8	243.2	−7.41321	2.18452	−2.95675	−1.66197
Bromobenzene	C_6H_5Br	22.9	34.6	66.7	83.2	108.2	130.2	155.5	184.9	232.0	275.6	−8.10313	3.78791	−4.14347	−2.11742
Iodobenzene	C_6H_5I	45.4	58.1	92.8	110.5	137.4	160.8	187.8	219.0	268.9	315.1	−7.47909	2.53825	−3.54320	−1.50458
m-Chlorotoluene	C_7H_7Cl	24.5	37.3	71.6	88.8	114.6	137.0	162.3	191.3	237.3	279.7	−7.90360	2.90903	−4.76707	3.62554
Benzyl chloride	C_7H_7Cl	42.9	55.4	89.2	106.2	131.8	153.9	179.0	207.9	253.8	296.4	−6.24204	−0.59859	−2.50951	0.21300
***n*-Alkanes**															
Methane	CH_4					−176.1	−169.4	−161.6	−152.5	−137.8	−124.0	−6.02388	1.26813	−0.56948	−1.37648
Ethane	C_2H_6	−150.6	−145.2	−130.4	−122.7	−111.0	−100.7	−88.8	−75.0	−52.7	−32.1	−6.46252	1.35760	−1.04922	−2.03789
Propane	C_3H_8	−118.1	−111.5	−93.3	−83.9	−69.6	−57.0	−42.4	−25.5	1.7	26.9	−6.71480	1.38388	−1.30695	−2.56827
n-Butane	C_4H_{10}	−89.0	−81.3	−60.0	−49.1	−32.4	−17.7	−0.8	18.8	50.3	79.5	−7.08562	1.79335	−2.00003	−2.31975
n-Pentane	C_5H_{12}	−62.8	−54.1	−30.4	−18.1	0.5	16.9	35.7	57.6	92.6	124.9	−7.36401	1.94358	−2.47191	−2.34757
n-Hexane	C_6H_{14}	−38.9	−29.5	−3.6	9.8	30.0	47.8	68.3	92.1	130.1	165.1	−7.61075	2.00527	−2.74158	−2.82824

n-Heptane	C_7H_{16}	−16.7	−6.6	21.1	35.4	57.0	76.1	98.0	123.4	163.9	201.1	−7.75469	1.84795	−2.80333	−3.62418
n-Octane	C_8H_{18}	3.9	14.6	43.9	59.0	81.9	102.0	125.2	152.0	194.8	234.1	−8.01133	1.98859	−3.26507	−3.99439
n-Nonane	C_9H_{20}	22.7	34.0	64.9	80.7	104.8	126.0	150.3	178.5	223.3	264.4	−8.45145	2.57850	−4.17533	−3.66755
n-Decane	$C_{10}H_{22}$	40.4	52.2	84.5	101.1	126.3	148.3	173.6	202.9	249.5	292.0	−8.62717	2.55890	−4.50221	−3.63420
n-Undecane	$C_{11}H_{24}$	57.3	69.6	103.1	120.3	146.3	169.2	195.3	225.7	273.8	317.7	−8.73044	2.35716	−4.52576	−4.46648
n-Dodecane	$C_{12}H_{26}$	73.2	85.9	120.4	138.2	165.1	188.7	215.7	247.1	296.6	341.4	−8.97902	2.40530	−4.55315	−5.99492
n-Tridecane	$C_{13}H_{28}$	88.4	101.4	136.9	155.2	182.9	207.1	234.9	266.9	317.3	363.0	−8.71245	1.11086	−3.15308	−8.81599
n-Tetradecane	$C_{14}H_{30}$	102.1	115.6	152.4	171.2	199.6	224.5	252.9	285.8	338.0	385.4	−8.99672	1.98553	−5.38986	−4.09226
n-Pentadecane	$C_{15}H_{32}$	115.8	129.5	167.1	186.3	215.4	240.9	270.0	303.5	356.4	404.4	−8.86498	0.89612	−3.70098	−8.72916
n-Hexadecane	$C_{16}H_{34}$	128.5	142.6	181.0	200.7	230.5	256.5	286.1	320.4	374.3	423.4	−8.96067	0.85195	−4.04080	−8.42218
n-Heptadecane	$C_{17}H_{36}$	141.2	155.7	195.1	215.2	245.4	271.7	301.8	336.4	390.9	440.2	−9.43782	1.65057	−5.70751	−4.71679
n-Octadecane	$C_{18}H_{38}$	152.6	167.3	207.3	227.7	258.4	285.1	315.6	350.8	406.1	455.6	−9.87775	2.42883	−7.03772	−3.36978
n-Nonadecane	$C_{19}H_{40}$	163.9	178.8	219.3	240.0	271.2	298.5	329.5	365.1	420.8	470.3	−9.91003	1.64273	−5.20678	−10.43208
n-Eicosane	$C_{20}H_{42}$	174.7	189.8	231.1	252.2	284.0	311.7	343.1	379.0	435.2	486.5	−8.99815	−1.30230	−1.45511	−16.74038
Isoalkanes															
Isobutane	C_4H_{10}	−97.2	−89.8	−69.4	−58.8	−42.7	−28.5	−12.1	7.0	37.7	66.2	−6.90675	1.57740	−1.80160	−2.42893
2-Methyl butane	C_5H_{12}	−69.3	−60.9	−37.6	−25.6	−7.3	8.9	27.5	49.1	83.7	115.8	−7.18224	1.72845	−2.05353	−2.71274
2,2-Dimethyl propane	C_5H_{12}						−8.6	9.1	29.9	63.3	94.4	−6.98355	1.67850	−2.08470	−2.42800
2-Methyl pentane	C_6H_{14}	−45.6	−36.3	−10.9	2.2	22.1	39.6	59.8	83.3	120.8	155.5	−7.49311	1.93828	−2.57247	−2.85203
3-Methyl pentane	C_6H_{14}	−43.8	−34.4	−8.7	4.6	24.7	42.4	62.8	86.6	124.7	160.0	−7.76049	2.81104	−3.61863	−1.53175
2,2-Dimethyl butane	C_6H_{14}	−54.7	−45.7	−20.7	−7.8	11.9	29.3	49.3	72.7	110.0	144.4	−6.84403	0.74239	−0.92872	−4.01577
2,3-Dimethyl butane	C_6H_{14}	−48.7	−39.3	−13.7	−0.5	19.6	37.2	57.5	81.1	118.8	153.8	−7.23412	1.74312	−2.49507	−1.81829
Olefins															
Ethylene	C_2H_4	−160.5	−155.5	−142.0	−135.0	−124.3	−114.9	−104.0	−91.3	−70.9	−51.8	−6.41327	1.45469	−1.24183	−1.99446
Propylene	C_3H_6	−121.5	−115.1	−97.4	−88.3	−74.4	−62.1	−48.0	−31.5	−5.2	19.2	−6.66599	1.43430	−1.39324	−2.46883
1-Butene	C_4H_8	−92.5	−84.9	−64.3	−53.7	−37.4	−23.1	−6.7	12.6	43.3	71.8	−7.07897	1.87819	−2.02256	−2.64845
1-Pentene	C_5H_{10}	−67.1	−58.7	−35.4	−23.4	−5.1	11.0	29.6	51.2	85.6	117.4	−7.23957	1.68881	−1.87158	−3.19856
1-Hexene	C_6H_{12}	−42.7	−33.4	−8.0	5.2	25.2	42.8	63.1	86.7	124.4	159.2	−7.47396	1.85450	−2.38903	−3.50639
1-Heptene	C_7H_{14}	−20.6	−10.6	16.9	31.0	52.5	71.4	93.2	118.7	159.2	196.4	−8.62839	3.98397	−4.58652	−2.45443
1-Octene	C_8H_{16}	0.0	10.6	39.8	54.8	77.7	97.8	120.8	147.5	189.7	228.1	−7.93750	1.47392	−1.85509	−5.72867
Propadiene	C_3H_4	−109.8	−103.4	−85.8	−76.6	−62.4	−49.6	−34.7	−17.1	11.8	38.9	−8.00232	4.45942	−2.87994	−5.85178
1,2-Butadiene	C_4H_6	−80.9	−72.7	−50.4	−38.9	−21.7	−6.7	10.5	30.4	62.1	91.5	−6.07102	0.12159	−1.55692	−0.53215
1,3-Butadiene	C_4H_6	−90.8	−83.3	−62.6	−52.0	−35.7	−21.4	−4.8	14.4	45.1	73.5	−6.79824	1.08553	−0.96279	−3.84778
1,2-Pentadiene	C_5H_8	−55.0	−46.2	−22.1	−9.7	9.0	25.5	44.4	66.6	102.3	136.1	−5.94252	0.26690	−2.35857	−1.73048
trans-1,3-Pentadiene	C_5H_8	−57.9	−49.1	−25.0	−12.6	6.2	22.6	41.6	63.8	99.7	133.9	−5.50529	−0.22313	−2.15448	−1.34395
1,4-Pentadiene	C_5H_8	−69.3	−60.9	−38.0	−26.2	−8.3	7.4	25.6	46.9	81.5	114.7	−5.36609	−0.09618	−2.39750	−1.13323
2,3-Pentadiene	C_5H_8	−51.8	−43.0	−18.7	−6.3	12.5	29.0	47.9	69.9	105.2	138.2	−6.57492	0.82240	−2.46643	−2.03177

D3.1. Table 3. (continued)

Substance	Formula	Vapor pressure in mbar										Equation (7)			
		5	10	50	100	250	500	1,000	2,000	5,000	10,000	*A*	*B*	*C*	*D*
Acetylene and derivatives															
Acetylene	C_2H_2								−72.1	−51.7	−32.9	−6.99241	1.57338	−1.33202	−5.21884
Propyne	C_3H_4	−100.9	−93.9	−75.0	−65.3	−50.7	−38.0	−23.4	−6.6	20.2	44.8	−7.11026	1.86493	−2.56109	−1.65671
2-Butyne	C_4H_6				−23.9	−6.3	9.1	26.6	46.9	79.1	108.6	−6.85375	0.83418	−1.42544	−2.91847
1-Butyne	C_4H_6	−79.1	−71.3	−50.2	−39.4	−23.0	−8.7	7.8	26.8	57.1	85.0	−7.17126	1.56844	−2.22263	−2.83839
Naphthenes															
Cyclopropane	C_3H_6	−111.2	−104.3	−85.4	−75.7	−61.0	−48.1	−33.1	−15.7	12.6	39.0	−8.18446	5.40338	−5.26106	0.29975
Cyclobutane	C_4H_8	−80.0	−71.9	−49.6	−38.1	−20.7	−5.4	12.2	32.6	65.0	94.8	−7.11287	1.86338	−1.59855	−2.35844
Cyclopentane	C_5H_{10}	−53.7	−44.7	−19.9	−7.1	12.3	29.3	48.8	71.5	107.8	141.3	−7.00184	1.67430	−1.95254	−2.43833
Methyl cyclopentane	C_6H_{12}	−37.7	−28.1	−1.8	11.8	32.4	50.5	71.4	95.7	134.5	170.5	−7.22687	1.83847	−2.26044	−2.89788
Ethyl cyclopentane	C_7H_{14}	−15.1	−4.7	23.7	38.4	60.7	80.3	102.9	129.2	171.2	209.9	−7.33383	1.58750	−2.00285	−3.84956
Propyl cyclopentane	C_8H_{16}	5.5	16.5	46.6	62.1	85.8	106.6	130.5	158.3	202.5	243.0	−7.56400	1.41441	−1.85483	−4.86488
Butyl cyclopentane	C_9H_{18}	24.6	36.3	68.2	84.5	109.2	130.9	155.9	185.0	231.7	274.9	−8.82045	4.56618	−6.39502	0.04910
Pentyl cyclopentane	$C_{10}H_{20}$	42.1	54.5	87.9	105.0	130.9	153.6	179.9	210.8	261.3	309.1	−8.34838	4.60920	−8.05957	2.47945
Hexyl cyclopentane	$C_{11}H_{22}$	60.4	72.9	107.3	125.0	151.9	175.5	202.6	233.9	283.6	328.9	−8.25942	1.53284	−2.79124	−6.47404
Cyclohexane	C_6H_{12}				19.2	40.3	58.9	80.3	105.2	145.1	182.0	−7.00979	1.57475	−1.96820	−3.26095
Methyl cyclohexane	C_7H_{14}	−17.9	−7.7	20.7	35.4	57.8	77.6	100.5	127.1	169.6	208.9	−6.99290	1.02989	−1.06613	−4.84894
Ethyl cyclohexane	C_8H_{16}	4.7	15.7	46.2	61.9	85.9	107.0	131.4	159.8	205.4	247.9	−6.62098	0.32843	−1.34736	−4.41951
Propyl cyclohexane	C_9H_{18}	23.2	34.9	67.0	83.5	108.6	130.7	156.2	186.0	233.9	279.1	−6.58910	0.42832	−2.35856	−3.12499
Butyl cyclohexane	$C_{10}H_{20}$	41.8	54.0	87.5	104.7	130.9	153.9	180.4	211.5	261.7	309.3	−6.34269	−0.12784	−2.48780	−3.28017
Pentyl cyclohexane	$C_{11}H_{22}$	58.7	71.5	106.5	124.4	151.6	175.5	203.1	235.4	287.2	334.7	−9.46392	5.58832	−7.94937	0.81254
Hexyl cyclohexane	$C_{12}H_{24}$	75.6	88.9	125.0	143.4	171.3	195.9	224.1	257.0	309.7	357.8	−9.74155	5.86346	−8.50766	1.30484
Cyclopentene	C_5H_8	−57.1	−48.1	−23.7	−11.1	8.0	24.7	43.9	66.2	101.7	134.5	−7.05071	1.79116	−2.02594	−2.17803
Cyclohexene	C_6H_{10}	−29.4	−19.6	7.4	21.3	42.5	61.1	82.5	107.5	147.3	184.3	−7.19079	1.97175	−2.26256	−3.04106
Aromatic compounds															
Benzene	C_6H_6			6.3	20.0	40.6	58.8	79.7	103.9	142.6	178.4	−7.11451	1.83981	−2.25158	−3.15179
Toluene	C_7H_8	−9.0	1.5	30.4	45.3	67.8	87.5	110.2	136.4	178.3	216.8	−7.50051	2.08939	−2.56368	−2.85042
Ethyl benzene	C_8H_{10}	9.6	20.8	51.3	67.0	90.8	111.7	135.7	163.5	207.7	248.4	−7.64476	2.01616	−2.69311	−3.25571
Propyl benzene	C_9H_{12}	26.2	38.0	70.1	86.6	111.6	133.5	158.7	187.9	234.3	276.9	−7.90921	2.25623	−3.18277	−3.03789
Butyl benzene	$C_{10}H_{14}$	44.8	57.0	90.4	107.5	133.6	156.5	182.8	213.2	261.3	305.3	−7.91469	1.51273	−2.16430	−5.64758
Pentyl benzene	$C_{11}H_{16}$	61.6	74.3	108.9	126.7	153.7	177.5	205.0	237.1	288.3	334.8	−9.80886	6.07290	−7.50612	−1.56859
Hexyl benzene	$C_{12}H_{18}$	77.4	90.5	126.4	144.8	172.7	197.3	225.6	258.5	311.0	358.4	−9.64511	5.19130	−6.86455	−2.47938
o-Xylene	C_8H_{10}	15.6	27.0	58.1	74.1	98.4	119.6	143.9	172.1	216.8	257.9	−7.60791	1.79921	−2.42215	−3.36892
m-Xylene	C_8H_{10}	12.1	23.3	54.0	69.8	93.7	114.6	138.6	166.4	210.5	250.9	−7.63902	1.65289	−2.19801	−3.94677

p-Xylene	C_8H_{10}		22.2	53.0	68.8	92.8	113.8	137.9	165.8	210.0	250.6	−7.67395	1.81953	−2.39673	−3.44627
1,2,3-Trimethyl benzene	C_9H_{12}	38.5	50.8	84.4	101.5	127.4	149.9	175.7	205.3	252.0	294.7	−7.62987	1.23706	−2.24536	−2.65979
1,2,4-Trimethyl benzene	C_9H_{12}	34.2	46.2	79.0	95.8	121.2	143.5	168.9	198.3	244.8	287.2	−8.03805	2.10078	−2.99671	−3.00299
1,3,5-Trimethyl benzene	C_9H_{12}	31.3	43.2	75.7	92.3	117.3	139.2	164.2	193.0	238.4	279.7	−7.82434	1.27065	−2.17890	−3.60299
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$	61.0	73.9	108.8	126.7	153.7	177.4	204.6	236.2	286.5	332.6	−9.61420	5.81425	−7.22553	−0.17754
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$	56.4	69.1	103.5	121.1	147.7	170.9	197.6	228.3	277.2	321.9	−8.71211	3.45458	−5.00258	−1.61174
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$			102.2	119.9	146.5	169.7	196.2	226.8	275.0	319.1	−7.76585	0.96770	−2.26413	−3.93132
Pentamethyl benzene	$C_{11}H_{16}$	80.3	93.9	131.0	149.8	178.2	202.9	230.9	263.1	313.7	359.8	−8.00728	1.10336	−2.69076	−2.48217
Hexamethyl benzene	$C_{12}H_{18}$				179.3	208.4	233.8	262.9	296.5	349.7	398.5	−8.54789	2.39022	−4.64673	−4.09546
Styrene	C_8H_8	17.1	28.4	59.4	75.2	99.4	120.5	144.9	173.3	218.7	260.6	−8.15126	3.51813	−4.34082	−2.42333
Isopropyl benzene	C_9H_{12}	21.7	33.2	64.6	80.8	105.5	127.1	151.9	180.7	226.6	268.8	−7.53496	1.50829	−2.32928	−4.31012
Biphenyl	$C_{12}H_{10}$	97.0	111.1	149.7	169.4	199.2	225.1	254.7	288.9	342.9	392.4	−7.75945	1.70606	−2.96632	−3.06189
Diphenyl methane	$C_{13}H_{12}$	105.4	119.5	158.1	177.9	207.8	234.0	264.0	298.6	353.1	402.4	−8.53233	2.00873	−2.93179	−6.03029
Triphenyl methane	$C_{19}H_{16}$	178.3	194.6	238.8	261.3	295.3	324.9	358.8	397.9	459.9	516.6	−8.84156	2.41421	−5.56532	−2.75668
Tetraphenyl methane	$C_{25}H_{20}$			330.3	356.3	395.6	429.8	468.9	514.0	585.3	649.7	−9.59635	3.13229	−6.82319	−2.76211
Naphthalene	$C_{10}H_8$		80.6	117.1	135.8	164.1	188.9	217.4	250.4	303.0	351.4	−7.97682	2.86601	−3.50249	−2.67778
1-Methylnaphthalene	$C_{11}H_{10}$	86.8	100.9	139.4	159.0	188.7	214.5	243.9	277.8	331.2	380.1	−6.84372	−0.39471	−0.79459	−3.92723
2-Methylnaphthalene	$C_{11}H_{10}$	85.6	99.2	136.6	155.8	185.1	211.0	241.0	276.1	332.4	383.7	−10.50759	8.20742	−8.41116	−1.58015
1-Ethylnaphthalene	$C_{12}H_{12}$	99.8	113.9	152.3	171.9	201.6	227.7	257.6	292.3	347.6	398.3	−9.12884	4.70431	−6.05976	−1.87388
2-Ethylnaphthalene	$C_{12}H_{12}$	96.8	111.0	150.0	170.1	200.5	227.2	257.8	293.0	348.3	398.1	−8.42943	2.12066	−1.95832	−6.02831
Alcohols															
Methanol	CH_4O	−29.3	−20.4	3.4	15.2	32.7	47.5	64.1	82.8	111.4	136.6	−8.72963	1.45860	−2.78449	−0.70669
Ethanol	C_2H_6O	−15.7	−6.7	17.2	29.0	46.5	61.4	77.9	96.6	125.2	150.7	−8.33803	0.08720	−3.30575	−0.26001
1-Propanol	C_3H_8O	0.7	9.9	34.3	46.4	64.3	79.6	96.8	116.3	146.8	174.5	−8.60671	2.17353	−8.04678	3.69194
1-Butanol	$C_4H_{10}O$	16.8	26.3	51.5	64.1	82.9	99.1	117.4	138.3	171.4	201.9	−8.33120	2.05530	−8.17754	0.19316
1-Pentanol	$C_5H_{12}O$	30.6	40.4	66.8	80.1	100.2	117.6	137.5	160.3	196.4	229.6	−8.62225	2.10135	−6.29175	−6.79293
1-Hexanol	$C_6H_{14}O$	44.9	55.2	83.0	97.0	118.1	136.4	157.3	181.5	220.1	256.1	−9.17319	4.30846	−10.11890	−0.93221
1-Heptanol	$C_7H_{16}O$	59.9	70.3	98.4	112.8	134.7	153.9	176.1	202.0	243.7	282.4	−8.85687	3.21033	−7.48606	−12.12938
1-Octanol	$C_8H_{18}O$	72.5	83.4	113.0	128.2	151.2	171.4	194.8	222.1	266.4	307.4	−10.26829	6.70186	−11.65601	−6.37873
Isopropanol	C_3H_8O	−8.9	−0.3	22.7	34.1	51.1	65.6	81.9	100.4	129.3	155.6	−8.44737	1.17402	−6.97876	0.69248
2-Methyl-1-propanol	$C_4H_{10}O$	11.8	20.5	44.2	56.2	74.2	89.7	107.5	127.9	160.2	190.0	−7.82960	0.44510	−5.32308	−10.00835
3-Methyl-1-butanol	$C_5H_{12}O$	27.6	36.9	62.3	75.2	94.6	111.5	130.9	153.1	188.4	220.8	−8.27417	1.16334	−5.04768	−11.64372
Ethylene glycol	$C_2H_6O_2$	75.1	86.6	117.3	132.7	155.4	174.8	196.6	221.3	259.7	294.2	−7.85575	1.06762	−5.14271	−1.65660
1,3-Propylene glycol	$C_3H_8O_2$	85.6	97.8	130.2	146.4	170.4	190.9	213.7	239.1	277.7	311.2	−10.42988	2.74631	−2.20347	−6.30476
Glycerol	$C_3H_8O_3$	147.5	160.8	196.2	213.9	239.9	262.2	287.2	315.6	359.8	400.1	−6.94758	−0.33345	−5.98569	−1.33011
Cyclohexanol	$C_6H_{12}O$	47.1	57.3	84.8	98.8	120.2	138.9	160.4	185.6	226.3	264.7	−6.96569	0.93439	−5.00403	−10.29700
Benzyl alcohol	C_7H_8O	74.9	86.7	118.5	134.6	158.8	179.9	204.0	232.0	276.9	319.2	−7.38172	2.18313	−6.78536	−2.57851

D3.1. Table 3. (continued)

Substance	Formula	Vapor pressure in mbar										Equation (7)			
		5	10	50	100	250	500	1,000	2,000	5,000	10,000	*A*	*B*	*C*	*D*
Phenols															
o-Cresol	C_7H_8O	60.1	71.8	103.6	119.9	144.4	165.8	190.3	218.6	263.2	303.8	−8.83275	3.46650	−4.36291	−6.10327
m-Cresol	C_7H_8O	70.8	82.7	114.9	131.2	155.8	177.2	201.7	229.9	274.8	316.1	−8.84466	4.00993	−6.76021	−3.02124
p-Cresol	C_7H_8O	72.0	83.6	115.2	131.3	155.6	177.0	201.5	229.9	275.0	316.2	−11.38986	9.13086	−10.26796	−3.81158
Phenol	C_6H_6O	55.5	67.0	98.0	113.8	137.4	158.0	181.4	208.5	251.5	290.9	−10.48951	7.87328	−9.54201	−0.49292
Carboxylic acids															
Formic acid	CH_2O_2			22.3	37.0	59.2	78.4	100.2	125.0	163.7	198.4	−7.48216	0.88805	−0.32253	−2.58053
Acetic acid	$C_2H_4O_2$			41.2	55.7	77.5	96.3	117.5	141.6	179.1	212.5	−9.34304	3.77735	−3.59092	−1.57006
Propionic acid	$C_3H_6O_2$	23.7	34.8	64.3	79.0	100.9	119.7	140.8	164.7	201.7	234.9	−9.05245	2.46694	−4.73604	1.29659
Butyric acid	$C_4H_8O_2$	46.8	57.6	86.8	101.4	123.2	142.0	163.2	187.4	225.0	258.8	−9.92279	3.73064	−6.94231	−1.65235
Valeric acid	$C_5H_{10}O_2$	54.9	66.0	96.0	111.1	133.6	153.1	175.1	200.2	239.3	274.5	−9.07960	1.91018	−4.75458	−4.73450
Caproic acid	$C_6H_{12}O_2$	82.1	93.5	123.9	139.2	162.0	181.7	204.0	229.7	270.3	307.8	−9.90505	4.66763	−11.56156	2.59120
Acetic anhydride	$C_4H_6O_3$	20.7	31.5	60.7	75.5	97.8	117.1	139.1	164.3	204.0	240.2	−8.15436	1.80785	−3.76039	−3.04616
Propionic anhydride	$C_6H_{10}O_3$	37.5	50.2	83.5	99.8	123.8	144.0	166.5	191.9	231.3	267.1	−6.66964	−2.70670	−1.76623	7.54170
Chloroacetic acid	$C_2H_3Cl\ O_2$	67.3	78.4	108.4	123.5	146.3	166.0	188.6	214.5	255.6	293.3	−10.72534	7.62232	−10.44634	−2.56382
Dichloroacetic acid	$C_2H_2Cl_2O_2$	69.5	80.7	111.0	126.5	149.8	170.2	193.5	220.3	262.7	301.1	−10.38040	6.03907	−7.42780	−7.72727
Trichloroacetic acid	$C_2HCl_3O_2$	70.5	82.3	114.1	130.0	153.7	174.1	197.2	223.6	265.1	302.8	−8.80390	2.91469	−6.75915	−0.26065
Ketones															
Ketene	C_2H_2O	−121.4	−114.9	−97.4	−88.5	−75.0	−63.3	−50.0	−34.6	−10.1	12.6	−5.93228	0.34819	−1.82981	−0.11750
Acetone	C_3H_6O	−44.6	−35.7	−11.2	1.4	20.3	36.8	55.7	77.5	111.9	143.3	−7.67033	1.96469	−2.44380	−2.90162
Methyl ethyl ketone	C_4H_8O	−28.9	−19.2	7.4	20.9	41.2	59.0	79.2	102.5	139.4	173.2	−7.89149	2.46953	−3.52510	−0.92713
Diethyl ketone	$C_5H_{10}O$	−11.4	−1.3	26.2	40.3	61.6	80.2	101.4	125.9	164.7	200.2	−7.27265	0.63120	−1.64177	−4.36962
Dipropyl ketone	$C_7H_{14}O$	18.2	29.3	59.9	75.5	99.2	120.0	143.7	171.1	214.5	254.0	−7.98923	1.58266	−2.61251	−4.38408
Acetophenone	C_8H_8O	60.3	73.0	107.7	125.4	152.1	175.4	201.9	232.4	280.4	324.2	−6.96667	−0.37241	−0.80507	−4.88404
Benzophenone	$C_{13}H_{10}O$	138.2	153.2	194.0	214.8	246.2	273.6	305.0	341.3	398.8	450.9	−10.03049	5.92909	−7.69343	−1.20468
Ethers															
Dimethyl ether	C_2H_6O	−103.8	−96.7	−77.5	−67.6	−52.8	−39.9	−25.1	−8.0	19.3	44.5	−7.33288	2.67700	−3.40250	−0.11957
Diethyl ether	$C_4H_{10}O$	−61.3	−52.8	−29.7	−17.8	0.2	16.0	34.1	55.1	88.7	119.7	−7.55709	2.15613	−3.02766	−2.37858
Dipropyl ether	$C_6H_{14}O$	−21.9	−12.0	15.0	28.8	49.9	68.3	89.6	114.2	153.4	189.1	−8.55629	3.49469	−4.22192	−2.61530
Methyl propyl ether	$C_4H_{10}O$	−57.9	−49.4	−26.1	−14.1	4.1	20.1	38.5	60.1	94.8	127.1	−8.76101	5.30514	−6.07025	−0.78235
Ethyl propyl ether	$C_5H_{12}O$	−39.8	−30.9	−6.3	6.4	25.9	43.2	63.4	87.1	125.2	160.0	−10.68465	8.88906	−8.58949	−2.06505
Ethylene oxide	C_2H_4O	−76.9	−69.1	−47.9	−37.1	−20.6	−6.2	10.2	29.1	58.9	86.0	−6.39656	−0.13545	0.30047	−4.54866

Furane	C_4H_4O	−64.6	−55.8	−32.1	−20.1	−2.2	13.3	31.0	51.4	84.1	114.6	−7.98347	4.71720	−6.64737	3.77132
1,4-Dioxane	$C_4H_8O_2$			24.8	39.3	61.0	79.7	101.0	125.4	163.9	199.3	−7.40401	2.12025	−3.88819	1.69876
Aldehydes															
Formaldehyde	CH_2O		−90.5	−71.5	−61.7	−47.0	−34.1	−19.4	−2.6	23.8	47.7	−7.46907	1.28290	−0.50464	−4.29089
Acetaldehyde	C_2H_4O	−71.0	−62.8	−40.7	−29.3	−12.2	2.8	19.9	39.6	70.8	99.2	−7.48323	1.89754	−1.87991	−2.74165
Paraldehyde	$C_6H_{12}O_3$		18.9	47.2	61.6	83.3	102.2	123.8	148.7	188.1	224.3	−8.39247	2.66850	−4.68103	−2.64044
Furfural	$C_5H_4O_2$	32.9	44.7	76.4	92.5	116.6	137.4	160.9	187.8	229.7	267.6	−7.19466	0.15098	−1.29504	−2.81404
Benzaldehyde	C_7H_6O	42.3	54.5	87.6	104.6	130.2	152.7	178.3	208.0	254.8	297.6	−7.62714	1.75696	−2.27084	−3.91930
Salicylaldehyde	$C_7H_6O_2$	55.1	68.2	103.5	121.3	147.8	170.5	195.8	224.1	267.0	304.2	−10.08822	2.82918	−0.83177	−3.21642
Esters															
Methyl formate	$C_2H_4O_2$	−60.4	−52.1	−29.6	−18.1	−0.8	14.2	31.4	51.2	82.5	111.3	−7.09661	1.33571	−2.14672	−2.79247
Ethyl formate	$C_3H_6O_2$	−43.7	−35.0	−11.4	0.7	19.0	35.1	53.6	75.0	109.1	140.5	−7.17811	1.31054	−2.17904	−4.85150
Propyl formate	$C_4H_8O_2$	−25.1	−15.7	10.0	23.1	43.1	60.6	80.6	103.9	141.1	175.4	−7.55263	1.95726	−3.16613	−3.81792
Methyl acetate	$C_3H_6O_2$	−42.1	−33.2	−9.0	3.3	21.9	38.1	56.6	78.0	112.0	143.2	−8.57584	4.22791	−5.37346	−0.82045
Ethyl acetate	$C_4H_8O_2$	−27.4	−18.0	7.4	20.4	40.0	57.1	76.7	99.4	135.4	168.4	−7.89734	2.16798	−3.52390	−3.10641
Propyl acetate	$C_5H_{10}O_2$	−9.7	0.2	27.0	40.8	61.8	80.1	101.1	125.4	164.0	199.3	−7.89781	1.68898	−2.74051	−5.47967
Methyl propionate	$C_4H_8O_2$	−25.7	−16.2	9.4	22.5	42.2	59.4	79.1	102.0	138.4	172.0	−8.30872	3.53745	−5.20774	−1.27089
Ethyl propionate	$C_5H_{10}O_2$	−11.5	−1.7	25.1	38.8	59.6	77.7	98.5	122.7	161.4	197.0	−8.75519	4.14793	−5.89411	−1.78473
Propyl propionate	$C_6H_{12}O_2$	3.7	14.5	43.6	58.5	80.7	100.1	122.0	147.2	186.8	222.9	−7.79443	0.71065	−2.20915	−2.58752
Methyl butyrate	$C_5H_{10}O_2$	−9.5	0.6	27.9	41.8	62.8	81.2	102.3	126.6	165.6	201.5	−8.52321	3.78350	−5.74769	−0.69681
Ethyl butyrate	$C_6H_{12}O_2$	0.3	11.1	40.6	55.7	78.4	98.3	120.9	147.1	188.5	226.2	−8.18197	2.21896	−3.32406	−2.03342
Methyl benzoate	C_8H_8O2	60.0	72.3	105.8	123.1	149.3	172.4	198.9	229.7	278.6	323.1	−9.52872	5.22508	−5.67192	−4.59960
Ethyl benzoate	$C_9H_{10}O_2$	70.8	83.0	117.0	134.6	161.5	185.3	212.8	244.5	294.5	339.0	−9.49777	3.93518	−3.00984	−10.93022
Methyl salicylate	$C_8H_8O_3$	78.0	89.2	121.0	138.2	165.4	190.4	220.0	254.6	307.4	350.7	−14.30891	11.86128	−2.67256	−30.85630
Amines															
Methyl amine	CH_5N	−83.8	−76.8	−57.7	−48.1	−33.5	−21.0	−6.7	9.7	35.4	58.9	−6.93594	0.77016	−2.12846	−3.11687
Ethyl amine	C_2H_7N	−69.1	−61.3	−40.4	−29.7	−13.6	0.5	16.5	34.9	64.1	90.9	−7.14146	1.24486	−2.55143	−3.09059
Propyl amine	C_3H_9N	−48.5	−39.7	−16.1	−4.2	13.8	29.5	47.2	67.6	99.9	129.7	−6.32807	−0.41527	−1.86755	−1.82733
n-butyl amine	$C_6H_{15}N$	−27.3	−17.9	7.6	20.7	40.3	57.5	77.1	99.8	135.9	169.2	−7.88889	2.67770	−4.27421	−1.85122
Dimethyl amine	C_2H_7N	−74.4	−67.1	−47.3	−37.2	−22.0	−8.7	6.6	24.4	52.9	79.4	−8.48833	4.67224	−6.24955	−1.96675
Trimethyl amine	C_3H_9N	−84.8	−77.3	−56.4	−45.5	−28.9	−14.2	2.8	22.6	54.4	83.7	−7.30365	1.94801	−1.34682	−5.07582
Diethyl amine	$C_6H_{15}N$	−46.1	−36.9	−12.0	0.7	19.7	36.3	55.2	77.1	111.9	144.1	−7.36200	1.77888	−3.69788	0.28823
Triethyl amine	$C_6H_{15}N$	−24.6	−14.5	13.0	27.1	48.4	67.0	88.4	113.1	152.6	189.2	−7.73549	2.33990	−3.77932	−0.63259
Piperidine	$C_5H_{11}N$		−0.7	28.1	42.7	64.8	84.0	105.9	131.2	171.2	208.3	−6.79875	1.00957	−2.60941	−0.67208
Pyridine	C_6H_7N	−2.9	7.6	36.3	51.0	73.2	92.6	114.8	140.4	181.1	218.6	−7.07868	1.45189	−2.11714	−3.20359
Aniline	C_6H_7N	51.2	63.3	96.0	112.6	137.4	159.0	183.4	211.5	255.6	295.9	−7.86006	1.96206	−3.65571	−2.00622
N-methyl aniline	C_7H_9N	57.4	69.9	104.0	121.2	147.2	169.7	195.1	224.0	269.0	309.0	−8.99983	2.75304	−2.46251	−3.78980

D3.1. Table 3. (continued)

Substance	Formula	Vapor pressure in mbar										Equation (7)			
		5	10	50	100	250	500	1,000	2,000	5,000	10,000	*A*	*B*	*C*	*D*
N,*N*-dimethyl aniline	$C_8H_{11}N$	52.0	65.0	100.0	117.7	144.2	167.1	192.9	222.4	268.6	310.8	−6.91926	−0.79562	−1.01346	−1.30692
N,*N*-diethyl aniline	$C_{10}H_{15}N$	73.6	86.6	121.6	139.3	166.0	189.1	215.5	246.0	294.7	340.1	−7.13341	0.21353	−3.88149	−0.98901
Phenylhydrazine	$C_6H_8N_2$	93.8	107.0	143.4	162.1	190.4	215.2	243.4	275.7	325.9	370.0	−10.65944	5.59074	−3.56952	−8.23026
Diphenyl amine	$C_{12}H_{11}N$	134.0	149.3	190.7	211.7	243.3	270.7	301.8	337.3	392.8	442.8	−8.75985	2.00629	−3.23950	−3.32510
Nitriles															
Acetonitrile	C_2H_3N	−31.0	−20.6	7.3	21.4	42.3	60.5	81.0	104.6	141.9	175.9	−9.22263	5.68045	−6.67111	4.51306
Propionitrile	C_3H_5N	−17.9	−7.7	20.4	34.7	56.5	75.5	97.3	122.3	161.8	197.6	−7.82826	1.87534	−1.74704	−3.40003
Butyronitrile	C_4H_7N	−2.0	8.6	37.6	52.4	74.8	94.4	117.0	143.0	184.4	222.0	−9.07674	4.63491	−4.96526	−1.94727
Benzonitrile	C_7H_5N	51.3	63.4	96.8	114.1	140.4	163.6	190.3	221.2	270.1	314.2	−8.76503	3.46762	−2.58071	−7.03902
Amides															
Formamide	CH_3NO	82.2	94.8	129.0	146.2	171.9	194.0	219.1	247.6	292.1	332.3	−8.05102	1.89555	−3.34638	−3.18188
Nitroderivates															
Nitromethane	CH_3NO_2	−11.8	−1.7	26.0	40.1	61.3	79.8	100.8	124.9	162.6	196.7	−8.40409	2.96310	−2.55125	−3.12626
Nitrobenzene	$C_6H_5NO_2$	65.8	78.5	113.5	131.4	158.7	182.6	210.2	242.1	292.6	337.8	−11.42180	9.08136	−8.03968	−2.40144
o-Nitrotoluene	$C_7H_7NO_2$	75.0	88.0	123.6	141.8	169.4	193.5	220.9	252.4	301.5	345.5	−9.20649	3.25360	−2.90528	−5.87732
m-Nitrotoluene	$C_7H_7NO_2$	81.8	95.3	132.1	150.9	179.3	204.0	232.1	264.4	314.8	359.8	−9.97904	5.05231	−4.85807	−3.04363
p-Nitrotoluene	$C_7H_7NO_2$	85.1	98.9	136.2	155.3	184.1	209.3	238.1	271.5	324.6	373.0	−9.14840	4.60236	−6.10485	−0.71761

D3.1. Table 4. Enthalpies of vaporization at different temperatures in J/g

Substance	Formula	Temperature (°C)								Equation (9)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Elements														
Xenon	Xe	77.9	65.5	45.8						4.69619	6.10287	−3.768319	−1.078236	0.917114
Krypton	Kr									4.53207	6.22827	−3.542952	−1.700226	4.022385
Argon	Ar									4.84261	5.03919	−2.218775	−2.402365	7.051085
Air										0.28652	11.97235	−1.145111	−8.064787	14.645081
Nitrogen	N_2									5.07184	5.47148	−2.581923	−2.026983	5.480425
Oxygen	O_2									4.97014	5.30204	−2.421192	−2.154911	3.472270
Sulfur	S	355.5	352.0	348.6	345.8	341.5	334.3	326.8	319.1	0.83391	0.29462	0.000023		
Fluorine	F_2									4.47837	8.72648	−6.584538	0.389714	0.579951
Chlorine	Cl_2	296.6	282.9	267.4	253.2	228.0	168.2			5.11396	5.49446	−1.638879	−2.194771	4.360453
Bromine	Br_2			200.9	196.2	188.8	175.1	159.1	139.5	7.49419	0.92568	−0.113163	−0.025698	−0.197360
Iodine	I_2							171.4	162.4	6.56592	2.00206	0.000206		
Anorganic compounds														
Hydrogen fluoride	HF	287.7	313.4	347.1	381.4	444.2	555.8	561.6		−5.18098	64.63309	−88.769460	38.475692	−19.213870
Hydrogen chloride	HCl	405.1	367.6	320.4	269.9					7.67088	0.20254	0.928667	−1.253068	4.544424
Hydrogen bromide	HBr	214.4	201.8	184.2	165.7	128.0				3.64108	7.03187	1.546295	−8.296772	2.449759
Hydrogen iodide	HI	162.9	155.0	146.3	138.8	126.0				6.52572	1.44631	−0.100655	−0.009376	−0.219261
Hydrogen cyanide	HCN			1024	1005	969.0	881.6	710.4		14.93438	−6.80314	−0.045868	−0.065004	−0.145955
Water	H_2O				2454	2380	2257	2115	1940	6.85307	7.43804	−2.937595	−3.282093	8.397378
Hydrogen sulfide	H_2S	534.2	501.3	462.7	425.9	355.0				4.03399	11.42509	−8.776318	1.195807	0.952448
Ammonia	NH_3	1416	1345	1263	1187	1051	715.6			5.74477	7.28288	−2.428744	−2.261942	2.909378
Nitric oxide	NO									9.22523	6.92520	−0.413269	−5.159373	97.203137
Nitrogen dioxide	NO_2									10.54674	37.16610	−51.619512	10.653997	68.680656
Nitrous oxide	N_2O	326.0	285.9	232.7	170.0					6.47229	3.13505	0.829428	−2.961623	12.969986
Dinitrogentetroxide	N_2O_4									17.10093	9.30852	−21.253959	−1.535179	102.679020
Cyanogen	C_2N_2		452.7	426.3	401.4	356.0	241.4			9.34416	−2.91283	7.147434	−6.240980	9.063880
Phosphorus trichloride	PCl_3				236.3	226.1				5.00588	9.40431	−6.091275	0.740321	0.097910
Cyanogen chloride	ClCN			446.3	428.6	398.9	336.7	234.8		9.94103	0.20022	−0.085934	−0.000108	−0.000005
Silane	SiH_4	302.2	250.0							12.04169	−12.66485	9.554284	−3.383685	18.437953
Tetrachlorosilane	$SiCl_4$	197.0	188.7	181.6	176.2	167.6	150.0	124.9		5.69074	7.26313	−0.726791	−5.904069	18.531250
Carbon monoxide	CO									5.36544	4.61398	−1.500151	−2.362494	7.223824
Carbon dioxide	CO_2	339.7	293.3	230.9						6.29356	5.58825	−1.150946	−2.168773	31.513859
Carbon suboxide	C_3O_2	388.8	379.9	367.7						3.85706	12.51979	−1.466541	−12.059981	18.935744

D3.1. Table 4. (continued)

Substance	Formula	Temperature (°C)								Equation (9)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Carbonyl sulfide	COS	308.9	291.1	270.3	250.5	213.0				5.26390	6.82633	−4.049718	−0.902566	4.719170
Phosgene	CCl_2O	277.4	265.4	253.2	243.0	226.1	190.2	128.3		1.27695	26.84919	−25.323901	7.711919	0.246138
Carbon disulfide	CS_2		388.1	374.0	364.6	351.7	329.5	300.1	255.6	5.11988	10.62906	−9.288902	−0.698735	15.386540
Sulfur dioxide	SO_2	423.2	402.2	380.0	360.8	328.2	256.5			6.43046	6.41093	−2.662978	−0.896060	6.489831
Sulfur trioxide	SO_3				548.3	499.8	409.0	299.5	140.3	1.55618	23.48861	−9.147534	3.259366	−11.225329
Sulfuryl chloride	Cl_2SO_2	270.8	261.6	252.0	243.9	231.0	207.0	178.7	142.6	4.81312	9.37570	−4.943116	1.064302	−0.564284
Sulfur hexafluoride	SF_6	109.0	98.4	83.4	66.6					6.26231	6.40501	−2.747029	−2.003031	−72.803197
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	562.7	540.6	516.9	496.6	463.2	396.4	301.9		6.55525	4.23299	−2.363875	0.468305	−0.180912
Ethyl mercaptan	C_2H_6S	493.3	476.5	459.0	444.2	420.1	372.1	308.0	205.0	6.80697	4.46965	−1.818387	−0.923775	2.612589
Dimethyl sulfide	C_2H_6S	503.5	486.0	467.4	451.6	426.0	376.8	313.7	216.4	6.69172	5.20665	−3.208643	0.819280	−0.480074
Diethyl sulfide	$C_4H_{10}S$	435.0	422.4	409.1	397.9	380.1	346.9	307.5	257.5	7.32192	5.56252	−3.142609	0.674413	−0.388006
Thiophene	C_4H_4S		438.8	425.7	414.7	397.2	365.1	327.9	282.4	6.26860	6.29557	−3.767889	0.917693	−0.585746
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	444.4	396.3	333.0	261.4					5.34432	8.19605	−4.716205	−0.915983	4.082077
Difluoromethane (R32)	CH_2F_2	380.3	350.7	315.3	280.6	209.7				6.31467	6.57339	−2.449336	−1.596805	4.969907
Trifluoromethane (R23)	CHF_3	208.4	178.1	136.1						5.33728	10.11434	−6.515737	0.912341	−0.142635
Tetrafluoromethane (R14)	CF_4	45.8								6.90451	4.53442	−2.632334	−0.511569	3.574074
Methyl chloride	CH_3Cl	449.6	428.9	406.1	385.7	350.1	266.4			7.52784	1.79702	−0.314797	−1.088274	3.513993
Methylene chloride	CH_2Cl_2	389.5	375.2	360.1	347.3	326.8	287.7	238.9	168.1	5.48913	8.05864	−4.482770	0.992992	−0.431660
Chloroform	$CHCl_3$	289.8	281.5	272.5	264.8	252.4	229.2	201.2	163.6	7.16193	6.32194	−5.851382	2.576553	−2.746384
Carbon tetrachloride	CCl_4			219.0	212.8	203.3	185.8	165.0	138.1	6.79262	4.74990	−2.315979	−0.172679	3.053272
Bromomethane	CH_3Br	276.0	266.2	256.6	248.6	235.6	208.3	164.5		7.76803	5.56727	−7.230582	2.085873	4.403709
Dibromomethane	CH_2Br_2	236.4	229.5	222.5	216.9	208.3	193.5	177.3	158.7	5.90217	10.54835	−10.131479	4.169979	−0.342291
Tribromomethane	$CHBr_3$				174.1	169.2	159.8	149.2	137.0	10.34541	−11.68591	15.407923	−5.463728	0.309434
Tetrabromomethane	CBr_4						148.5	131.0		2.94192	12.07940	−3.508842	−3.779087	76.220152
Chlorodifluoromethane (R22)	$CHClF_2$	239.7	223.5	204.9	187.4	154.1				5.95795	7.77266	−4.647429	0.074274	4.096136
Dichlorofluoromethane (R21)	$CHCl_2F$	272.7	260.3	247.1	235.8	217.3	179.1	118.6		4.64484	12.93588	−10.395393	3.264061	−0.819565
Chlorotrifluoromethane (R13)	$CClF_3$	132.9	115.4	91.3						6.92913	3.46700	−0.923899	−1.124899	1.918255
Dichlorodifluoromethane (R12)	CCl_2F_2	174.3	164.2	152.8	142.2	122.5				5.66938	8.02998	−5.154107	−0.177208	4.608970
Trichlorofluoromethane (R11)	CCl_3F	206.6	198.6	190.2	183.1	171.4	147.0	111.1		5.41567	8.96541	−5.714602	−0.216220	4.647955
Ethyl fluoride (R161)	C_2H_5F	429.8	405.7	378.1	352.6	304.6				9.51720	−1.16297	0.541747	−0.037504	−0.041491
Ethyl chloride	C_2H_5Cl	428.4	411.1	392.6	376.7	350.5	296.6	215.3		6.30209	7.06337	−5.249715	1.249095	0.126838

Ethyl bromide	C_2H_5Br	258.9	264.4	262.0	256.5	244.7	220.7	193.8	155.2	14.52139	−12.89817	4.869861	7.100285	−46.731533
1,1-Dichloroethane	$C_2H_4Cl_2$	345.8	334.6	323.8	314.9	300.4	271.3	232.9	178.4	8.70837	−2.71451	7.371502	−6.147699	8.485117
1,2-Dichloroethane	$C_2H_4Cl_2$		379.1	366.5	356.6	341.5	314.6	283.3	243.5	8.56126	3.70808	−3.680483	1.403329	2.953142
1,2-Dibromoethane	$C_2H_4Br_2$				222.6	214.9	201.0	185.1	166.7	7.20165	−0.00816	5.018803	−3.197728	1.855801
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	228.6	210.2	187.8	165.6	118.5				6.71900	5.01141	−0.763635	−2.672683	10.182873
1,1,1-Trichloroethane	$C_2H_3Cl_3$		260.4	251.2	243.9	232.6	211.9	186.7	153.1	6.56423	6.65046	−4.263724	0.292419	3.965763
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$		279.9	272.3	266.5	257.7	242.1	223.8	201.6	8.22713	−3.08321	10.707890	−7.956865	7.682273
Pentachloroethane	C_2HCl_5				228.2	220.8	208.5	194.7	178.1	7.04290	8.50532	−4.661553	−1.636031	7.068760
Hexachloroethane	C_2Cl_6								162.3	4.61352	12.12143	−7.667006	2.877370	−12.587588
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$					169.9	154.4	135.8	111.6	6.68635	7.51370	−3.993648	0.369246	−0.772752
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		166.1	158.7	152.8	143.6	125.4	100.5	55.8	6.97858	5.20404	−1.607386	−1.851544	12.696545
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	152.3	145.1	137.0	129.7	117.3	89.1			7.99294	2.61639	−0.316162	−0.688124	−0.357781
1-Chloropropane	C_3H_7Cl	417.2	401.1	385.3	372.5	352.2	313.2	262.1	181.2	6.90066	6.18780	−4.021580	0.188325	5.019332
1-Chlorobutane	C_4H_9Cl	402.1	391.1	377.8	366.1	347.0	312.5	272.7	220.3	1.98680	26.31367	−26.025459	11.315390	−11.713944
1-Chloropentane	$C_5H_{11}Cl$	414.2	392.0	373.5	360.8	343.9	318.5	292.6		11.98674	0.04158	−5.045087	4.124543	14.191365
Chlorotrifluoroethene	C_2ClF_3		223.1	212.5	199.8					8.69389	10.04815	−6.152915	−4.930659	−53.084616
Vinyl chloride	C_2H_3Cl	382.9	362.7	341.8	324.0	293.7	224.9			−0.22946	25.94228	−21.553912	5.266260	3.943125
1,1-Dichloroethene	$C_2H_2Cl_2$	311.2	299.5	286.9	276.2	258.7	224.1	177.3		6.71423	5.31563	−2.937984	0.470263	−0.042603
Trichloroethene	C_2HCl_3	302.7	288.5	276.7	268.3	256.5	236.7	213.4	182.8	6.16853	7.47248	−3.556057	−2.178505	14.713520
Tetrachloroethene	C_2Cl_4			245.5	239.6	231.3	217.1	200.2	178.4	4.18516	10.62968	−2.623837	−5.374835	12.451366
Fluorobenzene	C_6H_5F		377.3	369.0	361.3	347.9	320.7	286.2	241.5	8.94237	−1.76739	4.988190	−3.559387	−1.628015
Chlorobenzene	C_6H_5Cl		380.9	371.5	364.0	352.4	331.4	307.2	278.1	8.17299	1.26513	1.758153	−2.434400	3.109045
Bromobenzene	C_6H_5Br		299.8	292.9	286.9	277.3	260.2	241.7	221.8	11.61418	−7.64685	6.214276	0.960149	−2.936095
Iodobenzene	C_6H_5I		256.4	248.7	243.1	235.3	223.0	210.6	197.1	6.50840	7.27177	−3.890897	−0.822891	6.073514
m-Chlorotoluene	C_7H_7Cl				332.5	329.7	324.2	315.3		8.03813	9.13193	−6.497782	−5.826589	9.843847
Benzyl chloride	C_7H_7Cl		406.8	396.6	389.1	378.1	359.4	338.3	313.3	9.17816	−2.64989	8.362278	−6.724665	7.266772
***n*-Alkanes**														
Methane	CH_4									4.99314	5.01992	−2.261379	−2.477646	4.425783
Ethane	C_2H_6	429.7	376.8							5.22295	7.28006	−4.737913	−0.589830	2.231339
Propane	C_3H_8	434.3	406.9	374.7	344.1	284.9				5.52801	7.88661	−5.323736	0.088186	2.147194
n-Butane	C_4H_{10}	426.3	406.7	385.4	366.5	333.7	258.3			5.90836	7.81092	−4.959362	−0.194761	3.830824
n-Pentane	C_5H_{12}	419.5	402.5	385.0	370.3	346.0	296.2	222.9		5.75681	9.95286	−6.871727	0.521979	4.474608
n-Hexane	C_6H_{14}	412.6	397.1	381.6	368.8	348.5	309.6			5.82255	11.20578	−8.077144	1.351285	3.455363
n-Heptane	C_7H_{16}	412.6	396.3	380.7	368.2	349.4	315.6	275.2	220.2	3.33801	21.88936	−18.680507	5.467222	2.994395
n-Octane	C_8H_{18}	411.5	395.1	379.6	367.6	349.8	319.1	284.5	241.5	4.48143	19.69699	−16.729253	5.297036	4.040976
n-Nonane	C_9H_{20}	408.2	392.1	377.0	365.4	348.5	319.9	289.0	252.6	6.04659	15.52925	−12.556768	4.153161	5.008624

D3.1. Table 4. (continued)

Substance	Formula	Temperature (°C)								Equation (9)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
n-Decane	$C_{10}H_{22}$		389.9	375.1	363.8	347.3	320.0	291.4	258.8	4.95196	20.62050	−17.243223	5.887415	4.332104
n-Undecane	$C_{11}H_{24}$		394.9	377.0	364.5	347.7	322.3	296.7	267.6	7.78079	10.07916	−4.141098	−1.829586	18.468668
n-Dodecane	$C_{12}H_{26}$			377.1	364.3	346.9	320.5	294.5	266.3	7.96676	8.96561	−2.426306	−1.278554	16.571637
n-Tridecane	$C_{13}H_{28}$			365.5	358.2	346.4	324.8	300.7	273.6	7.10363	14.69528	−8.501852	2.345396	−3.139495
n-Tetradecane	$C_{14}H_{30}$				369.4	348.1	320.4	296.9	272.7	7.96599	7.28007	4.698876	−9.566327	41.044420
n-Tentadecane	$C_{15}H_{32}$				372.1	348.6	318.6	294.6	272.3	10.21651	9.06799	−4.682578	−0.826136	38.409983
n-Hexadecane	$C_{16}H_{34}$				369.6	347.8	318.3	294.0	271.8	11.99309	8.12193	−8.228896	5.197405	26.068465
n-Heptadecane	$C_{17}H_{36}$					342.4	316.8	293.9	272.5	15.94792	2.03335	−8.589551	11.148766	7.322380
n-Octadecane	$C_{18}H_{38}$					337.4	312.5	291.8	272.4	9.51541	13.40476	−6.317356	−2.039126	29.956901
n-Nonadecane	$C_{19}H_{40}$					373.1	326.0	294.9	271.7	10.54728	11.87652	−5.153424	−3.744106	87.493331
n-Eicosane	$C_{20}H_{42}$					322.6	306.7	289.2	270.1	12.81896	4.66635	−0.617286	2.595100	−5.396590
Isoalkanes														
Isobutane	C_4H_{10}	397.1	377.0	354.5	334.3	298.5	211.2			5.98835	6.85491	−3.938590	−0.367091	2.965412
2-Methyl butane	C_5H_{12}	397.4	381.1	364.2	349.6	325.3	274.3	196.8		6.35592	6.65305	−3.411011	−0.779434	4.472309
2,2-Dimethyl propane	C_5H_{12}			322.7	307.4	281.5	223.1	111.8		6.46867	4.15130	0.521940	−4.307291	26.542963
2-Methyl pentane	C_6H_{14}	394.5	378.9	363.4	350.6	330.4	291.0	238.5	150.9	4.81796	14.28905	−11.187698	2.386775	3.472905
3-Methyl pentane	C_6H_{14}	398.1	384.5	369.7	357.0	336.4	296.9	246.8	171.4	7.07983	5.84423	−3.391733	1.111535	−2.171129
2,2-Dimethyl butane	C_6H_{14}	365.9	351.5	337.4	325.9	307.4	270.0	218.2		7.18105	4.13376	−0.743441	−2.296211	8.667922
2,3-Dimethyl butane	C_6H_{14}	377.5	365.0	351.9	340.8	322.7	286.5	236.5	151.9	3.71503	17.70893	−14.535304	2.757326	1.283650
Olefines														
Ethylene	C_2H_4	383.5	311.1							5.15017	6.90546	−4.236236	−0.597914	3.214310
Propylene	C_3H_6	442.1	412.4	377.4	343.9	278.6				4.87035	9.25307	−6.242188	0.360560	1.336162
1-Butene	C_4H_8	431.3	409.5	386.1	365.6	330.3	249.3			5.50512	9.20052	−6.866370	1.422830	2.320790
1-Pentene	C_5H_{10}	418.8	401.4	384.3	369.8	345.6	293.9	216.4		7.66871	1.15392	3.415900	−4.960346	12.898598
1-Hexene	C_6H_{12}	413.3	397.1	381.4	368.8	348.8	309.9	258.5	178.6	7.38311	5.02928	−1.646030	−1.616197	7.915952
1-Heptene	C_7H_{14}	405.3	391.6	377.4	365.7	347.5	315.3	278.5	231.1	10.68425	−0.03078	−1.897634	3.500746	−2.348299
1-Octene	C_8H_{16}	430.0	401.9	379.9	365.3	346.7	318.7	288.3	249.0	8.37599	7.64620	−5.811718	−0.575961	28.208226
Propadiene	C_3H_4	514.9	475.2	439.7	413.3	374.1				10.85574	−2.93460	−5.277903	10.932970	2.693704
1,2-Butadiene	C_4H_6	497.7	475.4	451.5	430.8	396.7	326.7	219.6		5.98729	6.05637	−3.164536	0.585024	−0.256915
1,3-Butadiene	C_4H_6	457.1	435.4	411.9	391.1	355.6	275.8			6.12668	7.20781	−4.977657	0.788958	0.983749
1,2-Pentadiene	C_5H_8	476.1	457.9	438.3	421.4	393.6	338.5	268.3	168.3	6.21662	0.23633	7.289616	−5.206911	3.359798
trans-1,3-Pentadiene	C_5H_8	461.1	445.0	427.3	411.5	384.5	328.3	253.6		3.99567	3.66631	7.516396	−8.228076	5.648565

1,4-Pentadiene	C_5H_8	427.4	406.3	384.0	365.3	335.1	277.2	202.5		2.62969	11.50101	−4.967289	0.927654	−0.260803
2,3-Pentadiene	C_5H_8	491.7	472.2	451.5	434.0	405.8	351.7	282.7	175.4	5.27437	9.08302	−4.723587	0.949364	−0.314331
Acetylene and derivatives														
Acetylene	C_2H_2	569.0	501.5	413.0						7.01232	5.82528	−5.445163	3.417345	−34.680940
Propyne	C_3H_4	588.0	557.3	522.7	491.2	435.4	296.5			6.48101	6.32478	−3.509968	−0.188971	0.363183
2-Butyne	C_4H_6		537.5	516.3	498.6	468.4	402.0	302.0		6.53927	3.54709	3.287518	−7.257675	17.508732
1-Butyne	C_4H_6	517.4	494.0	468.6	446.3	408.6	327.6	188.7		6.40166	6.42355	−2.507973	−0.883718	2.487889
Naphthenes														
Cyclopropane	C_3H_6	492.1	464.5	434.6	408.8	364.0	243.8			4.10398	16.22930	−17.831464	8.643670	−10.417706
Cyclobutane	C_4H_8	473.6	456.1	437.6	421.7	395.0	338.0	245.6		5.02909	12.58788	−11.443639	2.642137	1.339011
Cyclopentane	C_5H_{10}	455.0	438.5	421.9	408.3	386.8	345.8	292.4	208.8	3.48031	17.33664	−15.181137	4.136664	1.169032
Methyl cyclopentane	C_6H_{12}	420.4	406.4	392.2	380.4	362.0	327.5	284.9	225.7	5.36513	11.93058	−9.827485	2.605197	0.886476
Ethyl cyclopentane	C_7H_{14}	407.5	396.1	384.1	374.1	358.2	328.8	294.3	251.2	7.41293	5.09188	−2.727834	0.483221	−0.097023
Propyl cyclopentane	C_8H_{16}	401.4	390.9	379.8	370.6	356.0	329.3	298.7	262.0	7.51798	6.17117	−3.334058	0.617716	−0.142182
Butyl cyclopentane	C_9H_{18}	399.4	387.8	375.8	365.8	350.2	322.2	290.9	255.0	4.61191	12.28173	−5.906447	1.146999	−0.354122
Pentyl cyclopentane	$C_{10}H_{20}$		386.0	374.9	365.7	351.3	325.7	297.3	264.8	−2.36442	34.80637	−24.840574	5.444180	−1.296219
Hexyl cyclopentane	$C_{11}H_{22}$						326.9	300.9	274.7	6.01832	12.39627	−3.910071	−6.188255	57.277450
Cyclohexane	C_6H_{12}				394.9	376.7	341.9	299.0	242.8	3.43321	14.08811	−8.768835	0.700818	−0.075958
Methyl cyclohexane	C_7H_{14}	401.9	388.2	375.2	364.8	349.1	320.7	287.2	244.8	5.86225	8.38591	−4.688241	−0.234104	4.663049
Ethyl cyclohexane	C_8H_{16}	402.0	387.3	374.1	364.0	349.3	323.6	294.4	258.8	6.06462	5.99669	0.021058	−3.147369	8.089475
Propyl cyclohexane	C_9H_{18}	390.6	380.1	369.2	360.2	346.0	320.8	292.8	260.8	4.77281	11.27564	−5.859548	1.220392	−0.393610
Butyl cyclohexane	$C_{10}H_{20}$	387.0	375.9	365.1	356.7	343.8	321.2	295.9	266.5	3.11699	13.76670	−3.940294	−2.637072	4.182641
Pentyl cyclohexane	$C_{11}H_{22}$			369.2	354.9	338.2	317.8	299.5	277.7	1.09595	27.77240	−16.042648	−6.665319	37.301542
Hexyl cyclohexane	$C_{12}H_{24}$			372.8	357.4	339.3	317.3	299.6	281.1	7.39273	11.52195	−5.039922	−6.350955	35.495677
Cyclopentene	C_5H_8	457.4	442.4	426.7	413.6	392.4	350.6	294.7	205.3	4.47191	13.66093	−11.313902	2.320078	1.098033
Cyclohexene	C_6H_{10}	446.8	434.3	421.1	410.1	392.5	359.4	319.8	269.2	6.95475	4.47360	−1.826880	−0.308833	0.588157
Aromatic compounds														
Benzene	C_6H_6				436.6	415.4	378.6	335.9	281.5	5.01506	10.64512	−7.248132	1.081122	7.042247
Toluene	C_7H_8	459.2	443.0	427.7	415.9	398.3	367.7	333.0	290.6	4.60584	13.97224	−10.592315	2.120205	4.277128
Ethyl benzene	C_8H_{10}	439.8	424.7	410.7	400.0	384.3	357.6	328.3	293.8	7.02317	7.61074	−4.976695	0.602265	5.080508
Propyl benzene	C_9H_{12}	425.8	410.9	396.9	386.1	370.5	344.8	318.3	288.6	3.62566	22.73230	−21.222047	7.252477	2.271518
Butyl benzene	$C_{10}H_{14}$	473.3	439.2	412.0	394.1	372.1	343.3	318.4	292.5	5.14898	17.70384	−14.168239	1.589433	27.482771
Pentyl benzene	$C_{11}H_{16}$	402.7	393.4	383.8	375.8	363.4	341.3	317.0	289.8	6.66503	10.39716	−5.545843	1.118460	−0.335753
Hexyl benzene	$C_{12}H_{18}$	399.1	389.9	380.5	372.7	360.5	338.9	315.4	289.4	6.28846	11.79255	−5.802187	1.043274	−0.288998
o-Xylene	C_8H_{10}		443.6	426.5	414.3	397.7	371.7	344.4	312.8	8.11493	5.01374	−2.818447	−0.894619	11.408042
m-Xylene	C_8H_{10}		425.1	413.4	404.1	389.8	364.4	335.6	301.1	7.31900	7.77601	−5.382762	0.652283	2.134955

D3.1. Table 4. (continued)

Substance	Formula	Temperature (°C)								Equation (9)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
p-Xylene	C_8H_{10}				400.3	385.9	361.0	332.9	298.9	7.27992	7.34567	−4.422644	−0.568151	5.980841
1,2,3-Trimethyl benzene	C_9H_{12}		428.5	414.6	404.9	391.8	371.1	348.8	322.0	10.39204	−4.42696	9.379954	−7.666363	13.273177
1,2,4-Trimethyl benzene	C_9H_{12}		404.7	399.6	394.2	384.4	363.9	339.0	309.8	14.14613	−14.31772	14.977031	−4.290274	−4.728401
1,3,5-Trimethyl benzene	C_9H_{12}		414.1	404.4	396.3	383.6	360.5	334.5	304.2	9.36093	3.70265	−2.284621	0.510869	−0.170751
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$		443.5	436.9	429.5	415.6	387.8	356.8	324.5	14.72574	−13.04599	9.651435	5.333190	−15.111565
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$		415.7	406.7	399.2	387.4	366.2	342.8	316.3	8.84089	5.68826	−3.500096	0.827094	−0.386192
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$						361.5	340.7	316.1	8.26210	3.55266	3.825610	−8.200753	20.230350
Pentamethyl benzene	$C_{11}H_{16}$						364.8	347.4	327.3	8.55594	8.30926	−5.296077	−1.074775	2.719078
Hexamethyl benzene	$C_{12}H_{18}$								344.6	9.10299	5.01384	−0.785047	0.133023	−10.509367
Styrene	C_8H_8		451.8	438.8	428.3	412.1	383.8	352.7	317.1	5.47731	11.91525	−8.564188	2.365441	0.547993
Isopropyl benzene	C_9H_{12}	417.3	402.4	388.8	378.5	363.6	338.8	312.1	281.2	6.66408	9.33907	−6.038411	0.676301	5.975822
Biphenyl	$C_{12}H_{10}$						382.4	362.8	341.6	1.70054	25.15686	−18.899436	4.251738	−0.855146
Diphenyl methane	$C_{13}H_{12}$					394.0	366.0	342.8	321.4	9.00675	7.69856	−5.652358	0.748699	18.859222
Triphenyl methane	$C_{19}H_{16}$						348.0	320.9	301.0	11.04977	−4.00253	14.380095	−13.942709	51.676539
Tetraphenyl methane	$C_{25}H_{20}$									13.46819	−9.33186	20.483970	−18.580654	98.978472
Naphthalene	$C_{10}H_8$						395.7	373.8	348.6	6.77024	−1.52986	11.675602	−8.848106	6.693238
1-Methylnaphthalene	$C_{11}H_{10}$		419.6	413.2	407.7	398.9	383.1	365.6	346.3	9.25713	3.48065	−2.766466	1.004761	−1.145790
2-Methylnaphthalene	$C_{11}H_{10}$					406.5	381.7	361.6	342.4	3.25417	22.06250	−16.524312	−0.013957	18.711257
1-Ethylnaphthalene	$C_{12}H_{12}$		423.9	415.9	409.2	398.9	380.7	361.1	339.8	7.36124	8.46271	−4.662002	0.982685	−0.388774
2-Ethylnaphthalene	$C_{12}H_{12}$		417.8	407.3	399.5	388.5	370.9	353.0	333.5	9.05108	0.98067	4.290927	−4.442335	6.238904
Alcohols														
Methanol	CH_4O	1264	1236	1206	1178	1130	1020	860.5		5.87513	13.91543	−5.817880	−5.692542	6.867206
Ethanol	C_2H_6O	978.3	961.7	943.4	925.9	892.3	810.5	687.4	503.8	14.68765	−15.27120	26.062308	−20.049654	15.816504
1-Propanol	C_3H_8O	866.3	850.5	829.0	807.9	770.4	691.9	590.2	453.5	7.09691	11.44183	−0.591839	−4.892172	−6.194349
1-Butanol	$C_4H_{10}O$	785.7	763.0	738.2	716.6	681.3	612.9	529.8	425.3	4.03015	18.33568	−4.805636	−3.203926	0.121902
1-Pentanol	$C_5H_{12}O$	723.0	699.6	673.4	650.8	615.0	551.5	483.4	408.1	8.13707	10.66862	−5.837508	6.657004	−9.699874
1-Hexanol	$C_6H_{14}O$		644.3	621.1	601.7	571.3	517.3	458.4	392.0	2.44435	25.74538	−15.196810	5.362395	−3.664521
1-Heptanol	$C_7H_{16}O$		617.1	598.1	580.7	551.6	496.5	435.4	370.4	23.75612	−56.83212	67.088469	−16.584142	−7.134212
1-Octanol	$C_8H_{18}O$			593.8	565.8	528.4	473.0	419.6	362.9	1.58827	18.29196	1.067691	−4.809578	30.814714
Isopropanol	C_3H_8O	809.6	804.0	788.6	769.8	731.4	641.6	518.6	351.1	14.13231	−18.02015	33.713095	−20.808299	−7.959708
2-Methyl-1-propanol	$C_4H_{10}O$	789.9	758.2	725.5	698.3	655.5	577.3	486.9	376.0	4.97368	15.12048	−3.192398	−0.405800	1.018629
3-Methyl-1-butanol	$C_5H_{12}O$	715.4	690.6	664.3	642.2	607.4	544.0	472.4	388.0	3.88255	20.24928	−8.853088	2.052090	−2.258462
Ethylene glycol	$C_2H_6O_2$			1086	1067	1037	986.1	929.3	863.3	8.13928	4.42093	5.642486	−7.124221	6.367364

1,3-Propylene glycol	$C_3H_8O_2$	1045	988.0	941.2	909.5	869.8	818.5	778.6	743.5	14.64626	9.65793	−19.564276	9.124923	16.992097
Glycerol	$C_3H_8O_3$				928.1	922.0	898.2	861.7	815.9	4.73387	16.62968	−6.646488	2.052518	−13.771300
Cyclohexanol	$C_6H_{12}O$					591.4	531.0	466.3	396.9	−2.55487	29.64441	−14.287549	6.116097	−7.186767
Benzyl alcohol	C_7H_8O						546.2	506.6	458.9	3.34913	13.24673	−1.996925	1.494200	−22.898760
Phenols														
o-Cresol	C_7H_8O					537.4	493.3	453.9	416.3	10.08581	4.98638	−6.884921	6.896322	9.981746
m-Cresol	C_7H_8O				585.7	563.9	527.1	488.6	447.1	4.82038	16.25429	−9.515663	2.639245	1.427210
p-Cresol	C_7H_8O					584.7	538.6	493.8	447.2	3.01380	18.92231	−9.261038	1.816957	9.840609
Phenol	C_6H_6O					603.1	564.5	519.4	472.4	16.25689	−15.34588	9.259460	8.211334	−23.563509
Carboxylic acids														
Formic acid	CH_2O_2				432.3	447.4	480.2	504.1	503.2	9.14069	4.41867	−8.928896	−8.183706	34.855085
Acetic acid	$C_2H_4O_2$				390.6	390.7	396.1	398.9	389.6	6.68664	15.01449	−22.086618	3.077691	17.355072
Propionic acid	$C_3H_6O_2$			416.5	416.4	418.1	421.0	418.3	403.5	11.77484	2.45068	−8.403845	−2.905673	13.942673
Butyric acid	$C_4H_8O_2$			463.6	457.3	448.3	432.0	410.2	377.7	0.50559	36.57824	−33.991377	4.980803	6.390699
Valeric acid	$C_5H_{10}O_2$					449.3	432.5	410.4	377.7	2.90159	24.06047	−14.773870	−6.523610	19.2954
Caproic acid	$C_6H_{12}O_2$			554.6	540.5	519.0	481.7	441.9	398.1	4.25370	23.26701	−17.198935	5.834191	−1.078919
Acetic anhydride	$C_4H_6O_3$	540.1	513.8	491.9	476.5	455.7	422.6	386.4	342.1	7.67997	8.28034	−2.531167	−3.283667	18.320222
Propionic anhydride	$C_6H_{10}O_3$		419.3	409.4	401.1	388.1	364.3	337.1	305.1	11.45713	2.15584	−1.286751	0.295048	−0.165848
Chloroacetic acid	$C_2H_3ClO_2$						487.6	535.0	516.2	7.80889	14.48961	−14.106871	13.335034	−317.4308
Dichloroacetic acid	$C_2H_2Cl_2O_2$						403.7	398.1	376.2	9.84708	2.73482	4.148698	−6.722742	−63.020357
Trichloroacetic acid	$C_2HCl_3O_2$						351.0	327.6	301.4	8.28156	10.25534	−5.999703	1.470064	−1.111776
Ketones														
Ketene	C_2H_2O	461.4	431.4	395.2	360.6	296.1				8.36565	−5.55025	10.724366	−7.158805	6.288894
Acetone	C_3H_6O	605.9	582.5	558.9	539.4	508.3	448.7	372.3	258.2	5.74063	9.13074	−4.880084	0.019915	3.765513
Methyl ethyl ketone	C_4H_8O	518.1	506.6	494.0	482.7	463.4	423.7	370.6	295.2	7.14228	6.74892	−2.395885	−2.807929	1.610334
Diethyl ketone	$C_5H_{10}O$		479.9	463.3	450.5	431.0	394.8	350.0	291.2	7.24751	4.39650	1.992158	−4.861266	10.588261
Dipropyl ketone	$C_7H_{14}O$		418.0	406.8	397.3	382.4	355.2	323.9	286.6	8.54054	6.18280	−3.862185	0.981831	−0.611406
Acetophenone	C_8H_8O				452.6	439.4	417.4	394.4	368.7	−0.98031	38.40600	−33.357359	7.603605	1.866879
Benzophenone	$C_{13}H_{10}O$					394.5	381.6	365.5	346.9	7.76821	10.29210	−7.292775	3.327307	−7.132167
Ethers														
Dimethyl ether	C_2H_6O	493.8	470.7	442.6	415.8	366.9	242.6			6.61358	3.90987	0.389855	−3.265474	−1.047992
Diethyl ether	$C_4H_{10}O$	423.6	405.3	386.3	370.1	343.4	289.2	211.0		5.72696	9.12303	−4.705274	−0.175016	3.557340
Dipropyl ether	$C_6H_{14}O$	388.1	376.1	363.5	352.8	335.7	303.5	263.9	209.8	8.43477	5.37680	−3.634751	1.020844	−0.445512
Methyl propyl ether	$C_4H_{10}O$	438.5	418.7	397.9	380.5	353.1	302.4	240.0	104.8	12.29808	−12.22318	12.791077	−1.853721	−0.396068
Ethyl propyl ether	$C_5H_{12}O$	431.2	407.2	382.2	361.4	328.6	268.8	198.6	105.3	0.63409	15.10518	−3.156607	0.612196	−0.252355
Ethylene oxide	C_2H_4O	647.3	623.5	598.4	576.4	538.8	459.1	344.8		8.52547	−3.93731	8.784981	−6.457998	7.902455

D3.1. Table 4. (continued)

Substance	Formula	Temperature (°C)								Equation (9)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Furane	C_4H_4O	461.7	443.4	424.9	409.4	384.2	334.4	267.3	153.4	6.01449	6.38875	−2.231449	−1.256419	4.886085
1,4-Dioxane	$C_4H_8O_2$				422.1	413.0	390.3	357.2	311.3	8.80566	−2.87837	9.443275	−9.170193	0.833694
Aldehydes														
Formaldehyde	CH_2O	808.8	777.1	741.8	709.1	649.3	496.4			12.06808	−7.97155	7.710808	−4.856937	11.036836
Acetaldehyde	C_2H_4O	666.4	641.3	616.7	595.9	561.2	486.2			7.20109	6.63553	−4.441975	−1.480320	10.024175
Paraldehyde	$C_6H_{12}O_3$				338.9	325.6	299.4	268.4	230.8	9.33129	3.24299	−0.057958	0.120535	−6.743412
Furfural	$C_5H_4O_2$		532.3	518.8	508.6	494.0	469.5	442.8	411.0	0.70876	32.70269	−28.222034	5.205805	4.040472
Benzaldehyde	C_7H_6O	497.2	487.0	476.8	468.6	455.8	432.4	405.1	372.5	3.54711	12.53164	−3.340287	−3.677402	3.016282
Salicylaldehyde	$C_7H_6O_2$				416.6	410.3	399.5	387.2	372.2	26.90848	−41.82693	31.807059	−8.848384	5.540309
Esters														
Methyl formate	$C_2H_4O_2$	539.3	519.5	499.0	481.5	452.8	395.3	316.7		6.89413	6.01843	−2.694377	−0.840353	3.110258
Ethyl formate	$C_3H_6O_2$	488.5	470.3	451.1	434.9	409.2	360.8	300.0	208.3	4.47415	15.95005	−13.035900	4.462419	−2.281851
Propyl formate	$C_4H_8O_2$	455.6	440.3	424.4	411.1	390.0	350.2	302.3	239.8	7.59455	3.76681	0.594088	−1.239979	1.558213
Methyl acetate	$C_3H_6O_2$	488.2	474.0	457.2	442.2	417.8	371.3	313.0	222.2	6.24651	13.81319	−13.592686	6.280357	−9.776838
Ethyl acetate	$C_4H_8O_2$	450.9	436.3	420.9	407.9	387.0	347.0	297.2	228.4	8.65545	3.30110	−0.160488	−0.850538	1.010147
Propyl acetate	$C_5H_{10}O_2$	429.9	416.4	402.4	390.7	372.2	337.3	295.0	240.0	6.63509	9.44227	−4.350780	−0.398819	1.849160
Methyl propionate	$C_4H_8O_2$	460.0	444.3	427.8	414.0	391.9	350.8	301.6	236.5	8.24495	3.87501	−0.829044	0.344109	−0.413604
Ethyl propionate	$C_5H_{10}O_2$	386.5	395.1	393.0	386.0	369.5	333.0	290.7	241.3	10.48291	1.90991	−4.415043	9.017366	−46.620420
Propyl propionate	$C_6H_{12}O_2$			373.3	365.0	352.2	328.0	296.7	253.0	3.40390	24.73760	−19.159863	0.929405	7.696521
Methyl butyrate	$C_5H_{10}O_2$	429.7	416.6	402.8	391.2	372.7	338.5	298.1	246.7	7.22592	8.50382	−5.024452	1.195632	−0.550681
Ethyl butyrate	$C_6H_{12}O_2$	402.4	391.1	379.3	369.4	353.7	324.7	290.7	248.6	8.41156	6.59984	−3.794374	0.802575	−0.278759
Methyl benzoate	$C_8H_8O_2$						375.3	344.9		11.25328	1.94206	−1.556784	−5.351100	89.919764
Ethyl benzoate	$C_9H_{10}O_2$		386.0	378.7	372.7	363.2	346.3	327.6	306.5	11.62555	−0.15927	0.128177	−0.053452	0.079776
Methyl salicylate	$C_8H_8O_3$			410.3	403.1	391.8	371.6	349.4	324.8	8.98498	7.09493	−4.043975	0.869200	−0.378981
Amines														
Methyl amine	CH_5N	923.1	878.6	830.6	788.2	714.8	552.2			6.68704	5.59469	−0.071556	−3.085246	7.431487

Ethyl amine	C_2H_7N	693.4	662.8	631.4	604.3	558.9	463.2	319.4		7.77766	1.82614	3.635806	−4.492103	9.842348
Propyl amine	C_3H_9N	586.4	570.3	552.7	536.6	507.8	443.2	348.7	197.7	3.39340	12.71924	−1.316011	−8.140440	9.108951
n-Butyl amine	$C_6H_{15}N$		525.8	507.5	492.0	467.0	419.5	361.0	282.1	6.90260	7.60459	−3.614348	0.074152	0.044303
Dimethyl amine	C_2H_7N	672.1	637.9	600.9	568.9	515.8	404.9	214.3		5.68174	10.17800	−5.691902	1.408236	−1.170463
Trimethyl amine	C_3H_9N	433.5	414.5	393.8	375.6	345.0	278.5			7.62398	3.76969	−2.925155	0.979043	−1.193023
Diethyl amine	$C_6H_{15}N$		469.6	448.8	431.2	402.8	348.5	279.3	171.7	5.33934	10.56571	−5.837037	1.428051	−1.122078
Triethyl amine	$C_6H_{15}N$	378.0	366.9	354.9	344.7	328.3	297.5	259.9	209.2	7.74933	6.41111	−4.878480	1.631371	−1.542623
Piperidine	$C_5H_{11}N$			461.8	450.3	432.0	398.6	360.3	314.4	6.48159	6.79118	−3.820956	0.886131	−0.635871
Pyridine	C_6H_7N		539.1	522.9	510.4	491.5	458.4	421.0	376.2	6.78808	5.19130	−1.422034	−1.391907	4.491260
Aniline	C_6H_7N			585.0	574.7	559.3	532.4	502.5	467.7	7.07225	8.70667	−3.991451	−1.656520	3.263408
N-Methyl aniline	C_7H_9N	527.4	518.8	509.9	502.5	490.9	470.2	447.0	420.8	13.26061	−5.02657	3.272891	−0.737961	0.244629
N,N-dimethyl aniline	$C_8H_{11}N$				418.6	408.8	391.3	371.7	349.3	13.47310	−6.35431	4.138973	−0.981377	0.533077
N,N-diethyl aniline	$C_{10}H_{15}N$		421.6	411.5	403.1	390.1	367.0	341.9	314.0	6.19042	11.73523	−5.842622	1.090567	−0.337465
Phenylhydrazine	$C_6H_8N_2$				564.3	555.4	540.2	523.8	505.3	21.89034	−26.13478	18.999009	−5.040744	2.813373
Diphenyl amine	$C_{12}H_{11}N$						397.0	381.4	364.4	11.96840	0.31904	−0.177413	0.024112	0.020506
Nitriles														
Acetonitrile	C_2H_3N					805.5	755.2	679.3	589.8	12.63773	−0.41956	−9.636566	15.912158	−123.3607
Propionitrile	C_3H_5N	725.9	703.1	679.2	659.2	627.6	569.4	501.7	417.9	5.39746	9.28762	−5.079418	1.116363	−0.448885
Butyronitrile	C_4H_7N	640.6	621.3	601.2	584.7	559.3	515.6	469.6	418.6	15.18066	−13.56898	8.892253	1.838158	−2.367991
Benzonitrile	C_7H_5N			508.3	497.9	482.2	455.3	427.4	398.0	9.80839	3.44990	−5.365836	4.172565	−1.195374
Amides														
Formamide	CH_3NO				1378	1346	1291	1230	1164	9.70079	3.52359	−2.149747	0.503265	−0.248567
Nitroderivates														
Nitromethane	CH_3NO_2		669.9	649.6	634.0	611.1	572.4	529.3	476.6	10.84612	0.90457	−3.763319	2.190125	3.811262
Nitrobenzene	$C_6H_5NO_2$				448.3	434.7	413.5	391.3	365.8	13.98596	−19.90491	26.349415	−13.211884	12.803755
o-Nitrotoluene	$C_7H_7NO_2$			434.5	425.5	412.4	391.3	370.1	348.1	11.62596	2.43803	−5.209765	3.612648	1.807934
m-Nitrotoluene	$C_7H_7NO_2$				417.8	411.8	397.4	379.1	358.1	12.46410	−0.06534	−3.559221	4.246115	−10.130675
p-Nitrotoluene	$C_7H_7NO_2$						401.2	382.3	359.6	9.68851	4.92278	−5.325247	4.020553	−13.754145

D3.1. Table 5. Specific heat capacity c_P of liquids at constant pressure in J/g K

Substance	Formula	Temperature (°C)								Equation (8)					
		−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*	*E*	*F*
Elements															
Xenon	Xe	0.470	0.770							0.4536	4.0921	3.9528	−29.0063	75.8030	−62.9962
Krypton	Kr									0.4540	4.3618	−0.8361	−2.7617	12.9684	−9.9919
Argon	Ar									0.4509	4.5477	−4.1814	18.3045	−39.5634	38.7660
Air										0.4764	5.5446	1.1919	−13.3371	37.8579	−29.7212
Nitrogen	N_2									0.4786	5.6086	−1.1144	2.1294	5.8166	−8.5275
Oxygen	O_2									0.4842	5.1121	2.1237	−12.2421	29.7659	−21.3778
Sulfur	S						1.439				−11.2815	24.8360			
Fluorine	F_2									0.5138	5.1344	3.5766	−14.2066	29.8332	−21.5485
Chlorine	Cl_2	0.948	0.979	1.003	1.041	1.272				0.3453	9.6564	−36.4320	201.1762	−460.0757	367.6988
Bromine	Br_2		0.484	0.477							7.2677	3.8178			
Iodine	I_2						0.318	0.318	0.318		9.7011				
Anorganic compounds															
Hydrogen fluoride	HF	2.297	2.428	2.562						1.0347	2.8797	4.1022	−9.5518	0.6808	10.6306
Hydrogen chloride	HCl									1.1345	−5.2809	71.8140	−174.0520	135.2957	12.3158
Hydrogen bromide	HBr										7.3745	−0.4312			
Hydrogen iodide	HI	0.455									5.2636	4.1993			
Hydrogen cyanide	HCN		2.607	2.621							8.9009	−1.0655			
Water	H_2O		4.212	4.188	4.180	4.217	4.313	4.499	4.869	0.2399	12.8647	−33.6392	104.7686	−155.4709	92.3726
Hydrogen sulfide	H_2S	2.021	2.095	2.208	2.565					0.5378	6.1881	4.7466	−25.8471	62.3782	−43.2404
Ammonia	NH_3	4.488	4.616	4.746	5.064					0.5616	7.2382	2.7201	−7.7814	22.6538	−30.8592
Nitric oxide	NO									2.9046	28.5404	−169.6540	120.0529	913.7753	−1501.0300
Nitrogen dioxide	NO_2		3.006	3.079	3.189	3.371					19.8275	−8.7134			
Nitrous oxide	N_2O	1.941	2.273	3.199						0.4454	8.8255	−6.7522	17.5923	−23.641	22.0174
Dinitrogentetroxide	N_2O_4		1.503	1.539	1.594	1.686					19.8244	−8.7114			
Cyanogen	C_2N_2	2.016	2.567	3.846						12.4311	−1.4598	−91.6976	13.6141	−159.9473	1104.1285
Phosphorus trichloride	PCl_3	0.837	0.841	0.844	0.848						14.5988	−1.3758			
Cyanogen chloride	ClCN		1.478	1.504	1.542						12.6072	−4.2927			
Silane	SiH_4										7.8085	−0.8564			
Tetrachlorosilane	$SiCl_4$		0.814	0.821	0.831						18.2610	−3.5363			
Carbon monoxide	CO									0.4361	6.7941	−7.2244	22.9749	−33.6968	27.3780
Carbon dioxide	CO_2	2.115	2.542							0.4826	9.4642	−12.2772	62.6197	−153.1172	174.3140
Carbon suboxide	C_3O_2	1.500									18.1002	−22.2303	19.8732		
Carbonyl sulfide	COS	1.218	1.277	1.347	1.535	5.383				0.4434	9.1623	−11.2214	33.1793	−58.3488	47.4275
Phosgene	CCl_2O	1.011	1.018							−0.1917	12.3376	5.7238	−11.6654	−15.9746	33.2033
Carbon disulfide	CS_2	0.988	0.994	1.001	1.019	1.072	1.165	1.316	1.546	−0.000602	15.8105	−34.7870	67.8378	−61.7414	23.2452

Sulfur dioxide	SO_2	1.360	1.370	1.389	1.444	1.689	4.946			0.49318	9.838616	−5.2162	10.4498	−2.538	0.2025
Sulfur trioxide	SO_3			3.224							31.0397				
Sulfuryl chloride	Cl_2SO_2														
Sulfur hexafluoride	SF_6	0.904	1.027	1.225						0.4919	17.0151	−22.8856	17.9435	344.1647	−1202.8247
Organic compounds containing sulfur															
Methyl mercaptan	CH_4S	1.812	1.838	1.872						1.2188	5.9008	6.5471	−5.9594	−2.3710	9.8656
Ethyl mercaptan	C_2H_6S	1.826	1.856	1.887						−0.2394	18.8932	−8.8336	−15.0253	33.0373	−11.4703
Dimethyl sulfide	C_2H_6S	1.847	1.867	1.884							15.3628	−3.0859			
Diethyl sulfide	$C_4H_{10}S$	1.816	1.854	1.885							24.8907	−9.3678			
Thiophene	C_4H_4S	1.372	1.423	1.463	1.528	1.660	1.818			−1.3455	36.7609	−57.0029	0.3735	132.9958	−120.8312
Halogenated hydrocarbons															
Fluoromethane (R41)	CH_3F	2.254	2.555	3.237						0.4573	7.35738	−1.7868	2.5438	3.9312	−0.887
Difluoromethane (R32)	CH_2F_2	1.645								0.4827	9.7395	−7.7860	19.1934	−23.1056	16.5271
Trifluoromethane (R23)	CHF_3	1.462	1.847							0.5822	8.8835	2.9305	−24.8820	62.5446	−50.3571
Tetrafluoromethane (R14)	CF_4									−0.5912	21.4346	−54.6356	103.9865	−99.3261	44.1957
Methyl chloride	CH_3Cl	1.502	1.545	1.593	1.690	1.918				0.00097	13.2684	−17.7900	20.1696	−3.7396	−0.2871
Methylene chloride	CH_2Cl_2	1.158	1.175	1.188							13.6156	−3.4804			
Chloroform	$CHCl_3$	0.920	0.939	0.954	0.977						16.3925	−5.9310			
Carbon tetrachloride	CCl_4		0.857	0.856	0.866	0.982				9.0974	−11.8485	−31.2549	116.6462	64.4058	−193.2563
Bromomethane	CH_3Br	0.820	0.823								9.6167	−0.5387			
Dibromomethane	CH_2Br_2	0.602	0.598	0.602	0.619					3.5496	4.5450	1.9519	−1.4975	−13.8676	34.9504
Tribromomethane	$CHBr_3$				0.528						22.2716	−11.6166			
Tetrabromomethane	CBr_4					0.410	0.421				19.4442	−6.3606			
Chlorodifluoromethane (R22)	$CHClF_2$	1.123	1.175	1.239	1.42					0.5093	11.1754	−3.9432	−0.5057	9.8669	−4.5687
Dichlorofluoromethane (R21)	$CHCl_2F$	1.014	1.033	1.049	1.073						14.5385	−4.4214			
Chlorotrifluoromethane (R13)	$CClF_3$	1.040								0.1045	14.5341	−11.4812	−6.1931	37.4740	−16.4165
Dichlorodifluoromethane (R12)	CCl_2F_2	0.894	0.934	0.976	1.071	1.996				0.4707	14.3575	−16.6484	52.1728	−101.8845	76.6065
Trichlorofluoromethane (R11)	CCl_3F	0.847	0.866	0.883	0.912	0.986	1.164			0.4914	14.93805	−5.8469	5.5124	−4.9302	1.4427
Ethyl fluoride (R161)	C_2H_5F	1.881								0.3964	10.9715	−2.7972	−5.3547	7.6366	−0.0810
Ethyl chloride	C_2H_5Cl	1.528	1.579	1.633	1.734					0.3496	15.7297	−11.0908	−10.4450	33.5779	−12.9713
Ethyl bromide	C_2H_5Br	0.875	0.898	0.917							14.5606	−6.0873			
1,1-Dichloroethane	$C_2H_4Cl_2$	1.245	1.262	1.276	1.296						17.0357	−4.2085			
1,2-Dichloroethane	$C_2H_4Cl_2$	1.273	1.285	1.301	1.330					0.1540	23.8336	−61.2569	203.4469	−341.8857	219.5230
1,2-Dibromoethane	$C_2H_4Br_2$			0.715	0.738	0.776					22.2955	−11.1806			
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	1.392	1.495	1.624	2.118					0.4659	15.4281	−20.4118	60.4809	−117.8952	92.7296
1,1,1-Trichloroethane	$C_2H_3Cl_3$	1.044	1.064	1.079	1.102						20.4451	−6.7692			
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$	0.971	0.986	1.000	1.027	1.085	1.159	1.251			34.1473	−40.8553	27.9921		
Pentachloroethane	C_2HCl_5				1.010	1.023	1.065	1.133		0.8082	28.8553	−13.4334	−25.1521	56.4550	0.9020
Hexachloroethane	C_2Cl_6							0.995			36.1662	−24.5603			

D3.1. Table 5. (continued)

Substance	Formula	Temperature (°C)								Equation (8)					
		−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*	*E*	*F*
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$				0.950						27.4571	−10.0780			
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$	0.878	0.896	0.913	0.943	1.006	1.117	1.786		0.51793	22.73059	−15.7371	45.2567	−105.0239	90.1894
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	0.973	1.000	1.021	1.053	1.106					23.7241	−9.1099			
1-Chloropropane	C_3H_7Cl	1.614	1.641	1.662							17.8270	−5.0952			
1-Chlorobutane	C_4H_9Cl	1.653	1.696	1.738	1.812					1.8076	17.3296	−0.7740	−11.4579	4.5232	9.2855
1-Chloropentane	$C_5H_{11}Cl$	1.618	1.704	1.773	1.875	2.047					34.8116	−24.9739			
Chlorotrifluoroethene	C_2ClF_3	1.058									19.4091	−18.1599	14.1834		
Vinyl chloride	C_2H_3Cl	1.117	1.246	1.349	1.504	1.762					15.5355	−16.7781			
1,1-Dichloroethene	$C_2H_2Cl_2$	1.081	1.110	1.140						1.5539	8.3161	5.0683	−5.9131	−6.4196	13.4921
Trichloroethene	C_2HCl_3	0.936	0.952	0.965	0.984						18.0501	−5.7665			
Tetrachloroethene	C_2Cl_4		0.839	0.851	0.870	0.902					21.0779	−7.7665			
Fluorobenzene	C_6H_5F	1.455	1.492	1.522							22.1914	−9.6517			
Chlorobenzene	C_6H_5Cl	1.288	1.322	1.331	1.376					51.1281	−92.3533	−306.5358	812.1606	−43.2394	−574.0475
Bromobenzene	C_6H_5Br			0.940	0.992	1.077	1.163	1.249			29.9725	−21.7182			
Iodobenzene	C_6H_5I		0.770	0.777	0.789						23.0925	−6.7777			
m-Chlorotoluene	C_7H_7Cl					1.609	1.803	1.997			41.4660	−38.9736			
Benzyl chloride	C_7H_7Cl	1.342	1.393	1.433	1.494	1.596	1.697				33.9739	−21.2148			
***n*-Alkanes**															
Methane	CH_4									0.4708	5.7207	−0.6552	−0.4530	5.0199	−5.0556
Ethane	C_2H_6	2.961	3.621	5.682						0.4281	10.4584	−18.1757	51.6811	−75.8320	44.4690
Propane	C_3H_8	2.340	2.503	2.676	3.094					0.5219	13.0156	−3.9111	−21.2164	49.1038	−30.2438
n-Butane	C_4H_{10}	2.206	2.311	2.412	2.599	3.102				0.4943	19.1915	−11.5900	−13.3471	38.1134	−18.8852
n-Pentane	C_5H_{12}	2.123	2.210	2.292	2.437	2.749	3.283			0.4935	25.3941	−18.4831	−8.8055	27.9787	−5.5481
n-Hexane	C_6H_{14}	2.066	2.153	2.231	2.362	2.616	2.934	3.565		0.5687	29.2523	−5.2270	−66.7829	110.6460	−52.8290
n-Heptane	C_7H_{16}	2.079	2.153	2.222	2.340	2.565	2.828	3.184	4.544	0.6767	34.8802	−9.4333	−51.0547	57.7955	−1.9863
n-Octane	C_8H_{18}	2.074	2.144	2.209	2.321	2.531	2.766	3.040	3.500	0.6399	42.0897	−21.4435	−14.6527	−19.5539	54.7506
n-Nonane	C_9H_{20}	2.047	2.121	2.189	2.302	2.509	2.730	2.968	3.271	0.52876	50.2959	−37.7839	31.5903	−103.5592	105.4389
n-Decane	$C_{10}H_{22}$	2.025	2.104	2.174	2.288	2.493	2.706	2.929	3.180	0.5805	55.8884	−34.0842	6.4319	−67.7489	81.0979
n-Undecane	$C_{11}H_{24}$	2.051	2.137	2.206	2.309	2.481	2.653	2.825	2.997		63.8410	−41.3410			
n-Dodecane	$C_{12}H_{26}$		2.137	2.197	2.298	2.487	2.688	2.895	3.112	0.4831	71.9423	−57.3220	54.8202	−156.5306	146.1074
n-Tridecane	$C_{13}H_{28}$		2.150	2.200	2.283	2.444	2.633	2.847	3.091	1.0540	74.7978	−31.5528	−117.6551	208.0928	−98.0633
n-Tetradecane	$C_{14}H_{30}$			2.174	2.281	2.461	2.640	2.820	2.999		86.1144	−59.3516			
n-Pentadecane	$C_{15}H_{32}$			2.181	2.287	2.465	2.642	2.819	2.997		93.3129	−64.1464			
n-Hexadecane	$C_{16}H_{34}$			2.168	2.275	2.453	2.631	2.809	2.986		100.7177	−70.0879			
n-Heptadecane	$C_{17}H_{36}$				2.277	2.452	2.628	2.803	2.978		107.7204	−74.6158			
n-Octadecane	$C_{18}H_{38}$				2.271	2.445	2.618	2.792	2.965		114.5685	−79.3947			

n-Nonadecane	$C_{19}H_{40}$				2.267	2.443	2.619	2.795	2.971		122.6402	−86.1313			
n-Eicosane	$C_{20}H_{42}$				2.244	2.421	2.598	2.774	2.951		129.9485	−92.5652			
Isoalkanes															
Isobutane	C_4H_{10}	2.159	2.283	2.398	2.615	3.347				0.5019	18.6631	−13.6773	−3.2077	23.7670	−18.2744
2-Methyl butane	C_5H_{12}	2.036	2.151	2.250	2.412	2.746	3.390			0.4261	26.6688	−36.0009	67.0523	−114.4751	80.5553
2,2-Dimethyl propane	C_5H_{12}		2.166	2.280	2.468	2.899	4.955			0.4460	25.4168	−28.8264	36.1755	−53.5413	32.3813
2-Methyl pentane	C_6H_{14}	2.012	2.120	2.213	2.360	2.632	2.988	3.904		0.4974	31.9938	−35.1230	55.9259	−112.2866	88.1404
3-Methyl pentane	C_6H_{14}	2.016	2.109	2.190	2.321					0.2478	31.9772	−22.6839	−13.5507	32.0412	−11.1087
2,2-Dimethyl butane	C_6H_{14}	1.997	2.092	2.168							30.1997	−19.2861			
2,3-Dimethyl butane	C_6H_{14}	1.961	2.067	2.161	2.317	2.611	2.984	3.917		0.6360	29.6520	−15.3827	−23.3590	13.2590	21.6627
Olefines															
Ethylene	C_2H_4	3.290	6.565							0.4832	7.3899	−1.8990	−6.9588	33.3709	−27.4230
Propylene	C_3H_6	2.282	2.440	2.617	3.078					0.5432	10.8992	4.9726	−56.4635	124.9919	−89.5562
1-Butene	C_4H_8	2.098	2.192	2.284	2.457	2.991				0.4539	17.8592	−18.9490	26.8206	−31.7310	21.9467
1-Pentene	C_5H_{10}	2.054	2.138	2.213	2.333	2.550	2.900			0.4317	18.9109	14.8383	−83.2734	100.4051	−31.8309
1-Hexene	C_6H_{12}	2.014	2.092	2.161	2.275	2.488	2.734			0.2126	29.3722	−17.2174	−13.0392	18.2316	4.7262
1-Heptene	C_7H_{14}	1.940	2.042	2.128	2.262	2.485	2.715	3.083	5.879	1.1623	25.0569	22.4762	−75.7051	8.8914	49.3886
1-Octene	C_8H_{16}	1.997	2.069	2.135	2.245	2.443	2.656			0.8558	35.5492	−2.5332	−37.7196	−15.1334	59.2556
Propadiene	C_3H_4	2.262									12.6130	−4.6505			
1,2-Butadiene	C_4H_6	2.132	2.207							1.8310	7.9190	8.7781	−10.9833	−5.3964	16.0089
1,3-Butadiene	C_4H_6	2.064	2.163	2.259	2.431					0.1214	19.4545	−17.4079	−8.0930	41.2556	−21.3766
1,2-Pentadiene	C_5H_8	1.904	2.003	2.082	2.201						23.7833	−16.2516			
trans-1,3-Pentadiene	C_5H_8	2.037	2.108	2.164							22.4904	−11.5084			
1,4-Pentadiene	C_5H_8	1.990	2.064	2.138						2.2223	11.2795	5.5371	−13.7108	3.0954	10.8000
2,3-Pentadiene	C_5H_8	2.101	2.161	2.219						1.5604	16.3736	−7.4995	13.7603	−27.7122	23.9452
Acetylene and derivatives															
Acetylene	C_2H_2	3.310									11.2882	−4.7196			
Propyne	C_3H_4	2.546									13.9264	−4.3314			
2-Butyne	C_4H_6	2.199	2.257	2.303							17.6692	−7.0682			
1-Butyne	C_4H_6	2.316	2.418	2.509						−0.0061	24.8755	−47.5092	107.1645	−157.0534	98.7463
Naphthenes															
Cyclopropane	C_3H_6	1.933	2.017	2.100						0.4150	9.4185	2.0685	−19.3393	25.3390	−6.3267
Cyclobutane	C_4H_8	1.766	1.845	1.909							16.4351	−9.8045			
Cyclopentane	C_5H_{10}	1.581	1.670	1.755	1.901	2.185	2.540	3.239		0.5911	20.2987	−8.6195	−31.5870	25.6255	17.1836
Methyl cyclopentane	C_6H_{12}	1.691	1.782	1.864	2.001					0.2323	30.2852	−24.7645	−17.6496	30.2720	0.5545
Ethyl cyclopentane	C_7H_{14}	1.705	1.793	1.874						5.7711	7.7296	16.3179	−15.4401	−38.2401	46.8886
Propyl cyclopentane	C_8H_{16}	1.741	1.830	1.908	2.031	2.241				−0.8267	43.7797	−15.1467	−53.0231	21.3862	32.6773
Butyl cyclopentane	C_9H_{18}	1.771	1.849	1.920	2.038	2.269	2.544			1.7801	45.8700	−36.6364	−26.1177	49.3700	−9.4185
Pentyl cyclopentane	$C_{10}H_{20}$		1.821	1.911	2.047	2.272	2.498	2.724	2.949		59.8890	−49.9621			

D3.1. Table 5. (continued)

Substance	Formula	Temperature (°C)								Equation (8)					
		−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*	*E*	*F*
Hexyl cyclopentane	$C_{11}H_{22}$		1.841	1.915	2.029	2.226	2.432	2.651	2.886	0.1807	65.9848	−74.1315	62.1031	−74.2454	41.8551
Cyclohexane	C_6H_{12}			1.773	1.979	2.248	2.511	2.848	3.574	0.4835	28.0569	−6.7431	−118.2361	355.2759	−383.5819
Methyl cyclohexane	C_7H_{14}	1.688	1.779	1.860						5.5654	8.9219	1.2715	−7.0391	−36.0234	35.0283
Ethyl cyclohexane	C_8H_{16}	1.696	1.788	1.866	1.992	2.223				2.3215	32.3872	−15.4092	−20.3689	6.6446	12.0597
Propyl cyclohexane	C_9H_{18}	1.728	1.818	1.896	2.021	2.252	2.514			1.8529	44.6977	−28.2578	−36.0078	45.5607	−8.2807
Butyl cyclohexane	$C_{10}H_{20}$	1.746	1.832	1.908	2.032	2.269	2.543	2.856	3.206	0.0000	74.2074	−102.7589	37.7432	32.4584	−20.2443
Pentyl cyclohexane	$C_{11}H_{22}$		1.841	1.915	2.029	2.225	2.432	2.651	2.887	0.2992	64.8603	−62.1122	17.0306	−0.3030	−3.1476
Hexyl cyclohexane	$C_{12}H_{24}$		1.815	1.893	2.012	2.215	2.426	2.648	2.880	0.4211	70.2456	−45.4883	−67.7512	128.0094	−75.8804
Cyclopentene	C_5H_8	1.600	1.690	1.777						1.7041	15.4605	−7.8794	−23.6606	37.9550	−8.0892
Cyclohexene	C_6H_{10}	1.617	1.707	1.787	1.919						34.7359	−48.6391	26.8882		
Aromatic compounds															
Benzene	C_6H_6			1.710	1.802	1.980	2.189	2.460	3.037	0.4928	22.5398	−16.8877	10.0243	−39.3837	49.5380
Toluene	C_7H_8	1.561	1.625	1.685	1.783	1.964	2.158	2.380	2.697	0.4806	28.5306	−7.4267	39.8253	−98.5476	85.5686
Ethyl benzene	C_8H_{10}	1.587	1.653	1.714	1.814	1.997	2.189	2.392	2.636	0.4534	35.2674	−36.6767	62.8911	−149.3270	122.1201
Propyl benzene	C_9H_{12}	1.645	1.713	1.771	1.866	2.034	2.211	2.395	2.598	0.7061	36.1020	−5.9477	−47.3163	24.7981	15.5593
Butyl benzene	$C_{10}H_{14}$	1.668	1.737	1.796	1.893	2.076				6.0249	17.9699	20.0300	−33.0605	−27.6367	42.2093
Pentyl benzene	$C_{11}H_{16}$	1.693	1.754	1.808	1.900	2.079	2.292	2.538		0.5085	62.6754	−60.6823	−34.3506	104.3206	−46.7914
Hexyl benzene	$C_{12}H_{18}$		1.777	1.826	1.912	2.086	2.298	2.549		1.9918	62.0635	−52.3332	−40.5346	82.4337	−17.2071
o-Xylene	C_8H_{10}	1.622	1.689	1.742	1.822	1.955					33.6972	−21.4077			
m-Xylene	C_8H_{10}	1.583	1.649	1.706	1.799	1.974	2.174	2.398	2.646	0.1118	38.6021	−35.2435	−15.7768	55.5289	−29.2411
p-Xylene	C_8H_{10}			1.675	1.770	1.955	2.145	2.341	2.580	−0.2990	48.9714	−144.5391	451.2798	−811.3867	551.2969
1,2,3-Trimethyl benzene	C_9H_{12}	1.664	1.731	1.785	1.866	2.001	2.136				40.3021	−25.9359			
1,2,4-Trimethyl benzene	C_9H_{12}	1.650	1.723	1.782	1.870						40.9035	−27.6128			
1,3,5-Trimethyl benzene	C_9H_{12}	1.590	1.669	1.732	1.826						40.6495	−28.9186			
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$		1.732	1.779	1.862	2.026	2.216	2.437		4.2848	23.9196	24.7840	−53.0483	−47.5743	89.1333
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$		1.717	1.787	1.940	2.320	2.851			10.5141	41.7201	−50.9341	−52.6964	14.5810	114.1617
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$					2.020	2.144	2.267			44.6614	−26.8893			
Pentamethyl benzene	$C_{11}H_{16}$					2.036	2.197	2.357				−41.1902			
Hexamethyl benzene	$C_{12}H_{18}$							2.456	2.678		72.5988	−65.6444			
Styrene	C_8H_8	1.599	1.679	1.744	1.841	2.002					35.6852	−25.6714			
Isopropyl benzene	C_9H_{12}	1.540	1.643	1.725	1.845	2.042	2.232	2.416	2.594		42.7501	−29.5504	−6.9534		
Biphenyl	$C_{12}H_{10}$					1.828	1.968	2.107	2.246		55.3863	−40.7411			
Diphenyl methane	$C_{13}H_{12}$				1.632	1.750					53.9814	−36.4781			
Triphenyl methane	$C_{19}H_{16}$					1.849	2.017	2.186	2.354		103.0521	−85.6927			
Tetraphenyl methane	$C_{25}H_{20}$										124.7397	−98.4474			
Naphthalene	$C_{10}H_8$					1.770	1.968	2.156		2.4359	66.8590	−230.4433	405.3486	−105.5278	−276.8274

1-Methylnaphthalene	$C_{11}H_{10}$	1.430	1.507	1.568	1.660	1.813					51.8774	−40.4029			
2-Methylnaphthalene	$C_{11}H_{10}$				1.645	1.791	1.938	2.084			50.0618	−38.1222			
1-Ethylnaphthalene	$C_{12}H_{12}$		1.454	1.552	1.692	1.903	2.085	2.238	2.365	1.1098	40.9009	20.6195	−46.8963	−59.6600	41.2343
2-Ethylnaphthalene	$C_{12}H_{12}$				1.717	1.887	2.057	2.226	2.396		60.8250	−49.1561			
Alcohols															
Methanol	CH_4O	2.305	2.403	2.508	2.709	3.168	3.843	5.271		0.5687	14.1100	−11.9505	−23.4782	57.5551	−25.6027
Ethanol	C_2H_6O	2.005	2.273	2.512	2.871	3.408	3.901	4.811		0.4637	23.4689	−46.2095	199.4259	−540.6041	448.4512
1-Propanol	C_3H_8O	2.037	2.200	2.360	2.649	3.260				0.6912	38.2179	−58.7413	−12.0901	85.0842	−35.0164
1-Butanol	$C_4H_{10}O$	2.045	2.204	2.359	2.635	3.221				3.3654	31.6732	−30.7096	−46.5224	71.5993	−2.6518
1-Pentanol	$C_5H_{12}O$	2.038	2.191	2.336	2.590	3.117				5.7640	26.6380	−15.5749	−36.3870	3.5382	48.5789
1-Hexanol	$C_6H_{14}O$	2.189	2.228	2.267	2.338	2.488	2.677			0.9947	35.4470	−10.7701	−46.3435	73.1515	−22.5061
1-Heptanol	$C_7H_{16}O$	2.053	2.200	2.359	2.629	3.057				−2.9491	33.7457	165.4492	−191.4845	−590.5931	751.6760
1-Octanol	$C_8H_{18}O$		2.177	2.284	2.444	2.710	2.977				65.7798	−54.4787			
Isopropanol	C_3H_8O	2.079	2.326	2.556	2.927	3.538	4.078			0.0754	34.1737	−31.0153	31.5827	−23.8811	267.0049
2-Methyl-1-propanol	$C_4H_{10}O$	2.022	2.214	2.402	2.737	3.421				−1.1541	67.1054	−109.6802	−30.0361	184.3930	−91.2685
3-Methyl-1-butanol	$C_5H_{12}O$		2.177	2.348	2.632	3.108				−7.5978	91.8057	−67.9468	−196.7676	270.8408	−45.4001
Ethylene glycol	$C_2H_6O_2$		2.285	2.382	2.527	2.769	3.010	3.252			33.1585	−25.9580			
1,3-Propylene glycol	$C_3H_8O_2$	2.096	2.223	2.324	2.475	2.728	2.980	3.233			41.1843	−33.4694			
Glycerol	$C_3H_8O_3$				2.539	2.800	3.061	3.322	3.583		58.5772	−49.1381			
Cyclohexanol	$C_6H_{12}O$				2.353	2.778	3.204				61.8783	−66.6885			
Benzyl alcohol	C_7H_8O		1.852	1.977	2.164						60.3553	−58.4291			
Phenols															
o-Cresol	C_7H_8O				2.196	2.288					37.4785	−16.6030			
m-Cresol	C_7H_8O			2.072	2.160	2.307					42.7196	−26.9635			
p-Cresol	C_7H_8O				2.158	2.314					43.5313	−28.5582			
Phenol	C_6H_6O				2.171	2.340	2.509				38.7496	−26.5137			
Formic acid	CH_2O_2			2.152	2.198	2.276					14.4461	−5.0581			
Acetic acid	$C_2H_4O_2$			2.028	2.172	2.412					24.9984	−20.5089			
Propionic acid	$C_3H_6O_2$		1.963	2.028	2.158	2.466					47.2236	−94.2476	72.8580		
Butyric acid	$C_4H_8O_2$		1.937	2.000	2.127	2.425	2.829				57.1427	−113.8183	86.2909		
Valeric acid	$C_5H_{10}O_2$	1.730	1.849	1.945	2.088	2.324	2.561	2.809	3.085	−0.0598	49.0702	−80.7494	137.7914	−190.2687	96.7981
Caproic acid	$C_6H_{12}O_2$		1.956	2.030							47.2637	−34.0079			
Acetic anhydride	$C_4H_6O_3$		1.726	1.826	1.976						41.6471	−37.2452			
Propionic anhydride	$C_6H_{10}O_3$	1.713	1.746	1.778	1.835	1.952	2.098			0.8390	38.3509	−23.8366	−16.1349	38.9280	−9.3758
Chloroacetic acid	$C_2H_3ClO_2$					1.705	1.878	2.051			31.6919	−26.9876			
Dichloroacetic acid	$C_2H_2Cl_2O_2$			1.425	1.436	1.455	1.474				24.4101	−4.0323			
Trichloroacetic acid	$C_2HCl_3O_2$				1.496						29.4068				
Ketones															
Ketene	C_2H_2O	2.356	2.605							1.0168	9.3536	8.0381	−38.4052	19.0861	26.1846
Acetone	C_3H_6O	2.048	2.089	2.131	2.210	2.390	2.667	3.351		0.4401	17.6746	−9.0149	−10.9833	32.7183	−16.4221

D3.1. Table 5. (continued)

Substance	Formula	Temperature (°C)								Equation (8)					
		−25	0	20	50	100	150	200	250	*A*	*B*	*C*	*D*	*E*	*F*
Methyl ethyl ketone	C_4H_8O	2.120	2.154	2.190	2.260	2.430	2.671			0.0258	29.5239	−34.9573	9.5140	57.6739	−49.1627
Diethyl ketone	$C_5H_{10}O$	2.130	2.178	2.217	2.276	2.373					28.3672	−11.3035			
Dipropyl ketone	$C_7H_{14}O$	2.095	2.128	2.164	2.232	2.387	2.590	2.843		0.4867	44.1126	−28.1477	−54.4215	133.7556	−66.9157
Acetophenone	C_8H_8O				1.813	2.071	2.330	2.588	2.846		55.0435	−52.9669			
Benzophenone	$C_{13}H_{10}O$				1.663	1.787	1.912	2.037	2.162		64.1483	−45.3702			
Ethers															
Dimethyl ether	C_2H_6O	2.235									15.6505	−12.3916	9.9810		
Diethyl ether	$C_4H_{10}O$	2.167	2.228	2.287	2.394	2.644	3.120			0.4579	24.2072	−12.4384	−23.6768	75.2867	−53.6772
Dipropyl ether	$C_6H_{14}O$	2.036	2.100	2.157	2.252					0.8489	32.9852	−19.0684	−6.6259	17.1316	−1.3498
Methyl propyl ether	$C_4H_{10}O$	2.102	2.154	2.196							22.9736	−8.8446			
Ethyl propyl ether	$C_5H_{12}O$	2.122	2.178	2.223							28.5216	−11.9588			
Ethylene oxide	C_2H_4O	1.898	1.948							0.5144	9.1319	5.0866	−14.4010	−5.0022	23.4152
Furane	C_4H_4O	1.564	1.616	1.657							16.8854	−8.2558			
1,4-Dioxane	$C_4H_8O_2$			1.737	1.861	2.504				14.9556	−8.2892	−15.2032	−10.6474	−95.5742	303.9206
Aldehydes															
Formaldehyde	CH_2O	2.260	2.252	2.245							7.9630	0.5129			
Acetaldehyde	C_2H_4O		2.172	2.187	2.237	2.366	2.529			0.0301	13.5502	−4.3471	−10.5345	10.1945	26.1676
Paraldehyde	$C_6H_{12}O_3$			1.932	2.023						44.4541	−27.8338			
Furfural	$C_5H_4O_2$		1.588	1.633	1.700	1.812	1.925				28.6613	−17.4104			
Benzaldehyde	C_7H_6O	1.514	1.573	1.619	1.690	1.807	1.924				32.6724	−20.7589			
Salicylaldehyde	$C_7H_6O_2$			1.806	1.924	2.090	2.216			−0.1761	35.6500	3.4142	−9.9814	−57.1498	28.5470
Esters															
Methyl formate	$C_2H_4O_2$	1.773	1.870	1.966						2.4323	8.5529	2.6949	−10.5378	−6.8571	22.7822
Ethyl formate	$C_3H_6O_2$		1.904	1.965	2.055	2.206					23.2978	−13.6769			
Propyl formate	$C_4H_8O_2$				2.055	2.240					30.2098	−21.1066			
Methyl acetate	$C_3H_6O_2$			1.899	2.009	2.191					23.8692	−16.4962			
Ethyl acetate	$C_4H_8O_2$	1.837	1.878	1.925	2.020					2.7113	14.3161	4.2455	−12.3726	−9.7711	34.0380
Propyl acetate	$C_5H_{10}O_2$			1.919	2.032	2.220					35.4286	−25.3978			
Methyl propionate	$C_4H_8O_2$				2.038	2.228					29.9676	−21.4123			
Ethyl propionate	$C_5H_{10}O_2$				2.013	2.209					35.4565	−26.2732			
Propyl propionate	$C_6H_{12}O_2$			1.922	2.091	2.373	2.655				48.5529	−44.7961			
Methyl butyrate	$C_5H_{10}O_2$			1.900	2.064	2.337					40.8805	−37.2237			
Ethyl butyrate	$C_6H_{12}O2$			1.928	2.075	2.321	2.567				46.0171	−39.2174			

Methyl benzoate	C_8H_8O2		1.468	1.511	1.576	1.684	1.792				38.8848	−24.5138			
Ethyl benzoate	$C_9H_{10}O_2$	1.441	1.503	1.552	1.627	1.750	1.873	1.997			46.0903	−31.1162			
Methyl salicylate	C_8H_8O3				1.740	1.968	2.196	2.423	2.651		63.9845	−59.0472			
Amines															
Methyl amine	CH_5N	3.278									13.0650	−1.9359			
Ethyl amine	C_2H_7N	2.914	2.936								16.7792	−2.1398			
Propyl amine	C_3H_9N	2.688	2.721	2.747	2.787						21.4447	−4.6636			
n-Butyl amine	$C_6H_{15}N$	2.546	2.590	2.625	2.678						26.7711	−8.1938			
Dimethyl amine	C_2H_7N	2.992	3.023	3.047						0.0978	23.0471	−48.3890	105.8461	−43.5416	−68.4601
Trimethyl amine	C_3H_9N	2.129	2.187								18.2045	−7.1891			
Diethyl amine	$C_6H_{15}N$			2.418	2.525						27.6677	−15.6070			
Triethyl amine	$C_6H_{15}N$	2.004	2.095	2.168	2.277						37.1018	−23.6946			
Piperidine	$C_5H_{11}N$		2.080	2.116	2.170	2.260					27.2105	−10.9318			
Pyridine	C_6H_7N	1.556	1.622	1.675	1.754	1.885					24.1188	−15.5308			
Aniline	C_6H_7N		2.021	2.058	2.113	2.205	2.297				31.4110	−14.3919			
N-methyl aniline	C_7H_9N				1.982	2.165	2.348				43.4050	−33.1095			
N,*N*-dimethyl aniline	$C_8H_{11}N$			1.677	1.799	2.001	2.204				47.6961	−40.5442			
N,*N*-diethyl aniline	$C_{10}H_{15}N$				1.847	2.047	2.246	2.445			60.2696	−50.2392			
Phenylhydrazine	$C_6H_8N_2$						1.899	2.059	2.218		38.7215	−31.5745			
Diphenyl amine	$C_{12}H_{11}N$					1.806	1.964	2.122	2.280		65.2766	−52.4820			
Nitriles															
Acetonitrile	C_2H_3N	2.146	2.193	2.230	2.285						13.3227	−5.0019			
Propionitrile	C_3H_5N	2.071	2.117	2.159	2.233					1.5599	10.2610	6.6484	−9.8995	−9.1685	16.9766
Butyronitrile	C_4H_7N	2.130	2.193	2.243	2.318	2.444					24.6958	−12.1876			
Benzonitrile	C_7H_5N		1.548	1.595	1.666	1.783	1.901				31.6340	−20.4009			
Amides															
Formamide	CH_3NO			2.388	2.488	2.655	2.822	2.989			21.5877	−13.9625			
Nitroderivates															
Nitromethane	CH_3NO_2	1.703	1.721	1.741	1.779	1.865	1.979	2.122		0.1694	16.3236	−5.5744	−21.9064	46.8488	−23.4828
Nitrobenzene	$C_6H_5NO_2$			1.477	1.518	1.629	1.812	2.077		4.9788	21.6842	−2.7282	−59.2234	47.0123	34.6561
o-Nitrotoluene	$C_7H_7NO_2$		1.469	1.495	1.548	1.670	1.835			5.4736	20.8001	−1.6916	−20.7020	−12.8946	45.2649
M-Nitrotoluene	$C_7H_7NO_2$			1.465	1.546	1.683	1.819				43.9773	−32.9937			
p-Nitrotoluene	$C_7H_7NO_2$					1.680	1.834				46.5037	−37.7369			

D3.1. Table 6. Specific heat capacity c_P of ideal gases at constant pressure in J/g K

Substance	Formula	Temperature (°C)								Equation (10)						
		−50	0	25	100	200	300	400	500	*A*	*B*	*C*	*D*	*E*	*F*	*G*
Elements																
Xenon	Xe	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.0000	2.5000	2.5000	0.0000	0.0000	0.0000	0.0000
Krypton	Kr	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.0000	2.5000	2.5000	0.0000	0.0000	0.0000	0.0000
Argon	Ar	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.0000	2.5000	2.5000	0.0000	0.0000	0.0000	0.0000
Neon	Ne	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	0.0000	2.5000	2.5000	0.0000	0.0000	0.0000	0.0000
Helium	He	5.193	5.193	5.193	5.193	5.193	5.193	5.193	5.193	0.0000	2.5000	2.5000	0.0000	0.0000	0.0000	0.0000
Air		1.003	1.004	1.006	1.013	1.027	1.047	1.068	1.091	2548.9320	3.5248	−0.6366	−3.4281	49.8238	−120.3466	98.8658
Hydrogen	H_2	13.81	14.24	14.36	14.49	14.46	14.45	14.54	14.69	392.8422	2.4906	−3.6262	−1.9624	35.6197	−81.3691	62.6668
Nitrogen	N_2	1.039	1.039	1.039	1.042	1.053	1.070	1.092	1.115	432.2027	3.5160	2.8021	−4.1924	42.0153	−114.2500	111.1019
Oxygen	O_2	0.910	0.915	0.919	0.935	0.963	0.992	1.021	1.047	2122.2098	3.5302	−7.1076	−1.4542	30.6057	−83.6696	79.4375
Sulfur	S			0.738												
Fluorine	F_2	0.791	0.812	0.824	0.856	0.893	0.921	0.940	0.954	774.7434	3.5724	1.1782	−7.8357	66.9134	−126.3602	84.8592
Chlorine	Cl_2	0.456	0.472	0.479	0.494	0.506	0.513	0.518	0.521	443.2316	3.4079	0.3974	−2.9833	39.3781	−76.8680	54.8748
Bromine	Br_2	0.219	0.224	0.226	0.229	0.232	0.233	0.234	0.235	397.2602	3.4138	1.5597	2.2676	36.9159	−95.8106	76.6528
Iodine	I_2	0.143	0.145	0.146	0.147	0.147	0.148	0.148	0.149	366.5747	3.6859	2.5951	6.9245	30.7878	−102.6339	89.1827
Anorganic compounds																
Hydrogen fluoride	HF	1.457	1.456	1.456	1.456	1.456	1.459	1.465	1.475	3438.3914	3.5031	2.9592	9.0174	−168.6398	1068.5062	−1578.0575
Hydrogen chloride	HCl	0.799	0.799	0.799	0.799	0.803	0.810	0.820	0.833	1638.3959	3.5004	2.9346	8.4727	−98.1948	399.2317	−384.8918
Hydrogen bromide	HBr	0.361	0.361	0.361	0.361	0.363	0.367	0.373	0.380	1203.5373	3.4970	2.7948	10.7652	−91.1043	274.9226	−208.0079
Hydrogen iodide	HI	0.228	0.228	0.228	0.229	0.232	0.236	0.241	0.247	441.4535	3.4542	3.0037	6.5208	−1.2264	−62.0818	106.0830
Hydrogen cyanide	HCN	1.212	1.288	1.325	1.422	1.523	1.602	1.670	1.733	515.6639	4.2813	−4.7794	−8.9029	56.8035	−102.7379	71.0228
Water	H_2O	1.884	1.868	1.869	1.890	1.940	2.000	2.064	2.131	706.3032	5.1703	−6.0865	−6.6011	36.2723	−63.0965	46.2085
Hydrogen sulfide	H_2S	0.982	0.994	1.001	1.030	1.078	1.131	1.185	1.238	1132.4648	4.0398	2.7018	−8.5655	67.3144	−72.9692	42.8369
Ammonia	NH_3	2.016	2.057	2.090	2.219	2.422	2.623	2.809	2.977	931.6298	4.8468	−7.1757	−7.6727	51.3877	−93.4217	67.9515
Nitric oxide	NO				0.994	1.006	1.030	1.058	1.085	287.2527	2.8998	2.6046	85.3765	−134.9868	−124.2972	275.4122
Nitrogen dioxide	NO_2	0.759	0.788	0.804	0.855	0.922	0.981	1.031	1.071	1102.7744	4.0267	−1.3131	−3.5919	52.4358	−106.3789	75.9808
Nitrous oxide	N_2O	0.791	0.849	0.875	0.947	1.025	1.087	1.137	1.179	617.4643	3.1103	1.2306	6.1055	46.3864	−110.8822	97.5602
Dinitrogentetroxide	N_2O_4	0.766	0.849	0.884	0.968	1.051	1.115	1.167	1.210	337.3088	5.7078	−0.9773	−19.6801	135.9757	−243.3166	160.1653
Cyanogen	C_2N_2	0.978	1.060	1.092	1.167	1.236	1.292	1.342	1.388	376.7870	4.4648	−3.8440	−9.8745	79.1176	−152.6285	105.8138
Phosphorus trichloride	PCl_3	0.477	0.511	0.523	0.549	0.567	0.577	0.584	0.589	398.1926	4.3525	−0.1531	1.1615	71.8056	−167.9929	123.8929
Cyanogen chloride	ClCN	0.669	0.719	0.738	0.781	0.819	0.849	0.875	0.899	398.4260	3.3356	−3.3611	−4.8745	57.6110	−119.3350	87.3449
Silane	SiH_4	1.154	1.270	1.334	1.530	1.780	2.000	2.188	2.349	629.0517	4.5596	−2.1197	−12.7035	79.0943	−122.6738	80.9687
Tetrachlorosilane	$SiCl_4$	0.481	0.518	0.532	0.563	0.586	0.600	0.609	0.615	419.0276	5.0010	1.9959	14.9372	72.1162	−207.0673	166.0017
Carbon monoxide	CO	1.039	1.039	1.040	1.045	1.059	1.080	1.105	1.131	407.9796	3.5028	2.8524	−2.3018	32.9055	−100.1815	106.1141

Carbon dioxide	CO_2	0.761	0.817	0.844	0.916	0.996	1.060	1.113	1.158	514.5073	3.4923	−0.9306	−6.0861	54.1586	−97.5157	70.9687
Carbon suboxide	C_3O_2		0.928	0.964	1.061	1.161	1.237	1.296	1.344	631.7238	4.7475	2.2252	5.2648	98.7873	−230.0819	182.8060
Carbonyl sulfide	COS	0.616	0.667	0.690	0.747	0.803	0.843	0.875	0.901	543.0047	3.1567	−0.5532	−0.4687	52.1727	−114.4401	89.2277
Phosgene	CCl_2O	0.513	0.562	0.583	0.633	0.679	0.711	0.734	0.753	443.0941	4.0648	−1.2498	−6.3664	77.7307	−151.8155	106.2799
Carbon disulfide	CS_2	0.541	0.582	0.599	0.641	0.681	0.709	0.732	0.750	436.2681	3.2047	−0.1319	0.2557	53.8613	−119.4039	93.1550
Sulfur dioxide	SO_2	0.580	0.608	0.622	0.665	0.715	0.755	0.787	0.811	848.4734	4.1379	−0.0601	−4.0449	56.0276	−109.3350	76.8400
Sulfur trioxide	SO_3	0.553	0.607	0.633	0.700	0.772	0.827	0.869	0.901	648.4989	3.5687	1.2040	8.5348	57.7911	−128.2153	100.3963
Sulfuryl chloride	Cl_2SO_2	0.503	0.553	0.573	0.621	0.663	0.693	0.715	0.733	408.3318	3.3807	−0.1149	10.6613	66.5305	−176.9697	146.1224
Sulfur hexafluoride	SF_6	0.525	0.621	0.664	0.768	0.861	0.920	0.958	0.984	524.1686	3.5677	−1.3539	−10.7270	196.7052	−395.4602	263.8890
Organic compounds containing sulfur																
Methyl mercaptan	CH_4S	0.933	1.003	1.043	1.174	1.348	1.503	1.630	1.733	1407.0543	5.1177	−17.2008	−4.5149	69.3978	−185.7461	168.6903
Ethyl mercaptan	C_2H_6S	1.002	1.103	1.161	1.348	1.590	1.787	1.945	2.105	2728.1680	6.8872	−201.1551	−1.9961	74.6970	−408.9731	728.6239
Dimethyl sulfide	C_2H_6S	1.043	1.138	1.193	1.363	1.578	1.770	1.939	2.089	472.3136	11.9843	1.2309	−32.3455	145.0474	−221.3676	136.0872
Diethyl sulfide	$C_4H_{10}S$	1.102	1.225	1.296	1.522	1.815	2.072	2.289	2.469	764.7944	12.8974	7.4937	−68.3733	426.8748	−709.5073	437.1287
Thiophene	C_4H_4S	0.637	0.775	0.850	1.073	1.322	1.496	1.626	1.767	1585.4574	5.5875	14.0271	85.1905	−1221.8570	4559.8896	−5488.4600
Halogenated hydrocarbons																
Fluoromethane (R41)	CH_3F	0.986	0.988	0.990	0.993	0.997	1.001	1.005	1.009	1176.9659	4.0143	3.8936	7.5362	27.9098	−97.9809	137.9880
Difluoromethane (R32)	CH_2F_2		0.791	0.827	0.944	1.100	1.243	1.365	1.467	962.8984	4.3711	−5.4665	−7.5447	71.6125	−131.6434	90.6773
Trifluoromethane (R23)	CHF_3	0.620	0.693	0.729	0.836	0.960	1.060	1.139	1.201	809.8615	3.9766	−1.6866	−4.3891	84.4263	−165.5706	115.7209
Tetrafluoromethane (R14)	CF_4	0.580	0.658	0.694	0.791	0.893	0.968	1.024	1.066	666.5894	3.2199	0.9296	19.5008	69.7537	−169.5636	132.1724
Methyl chloride	CH_3Cl	0.715	0.771	0.806	0.916	1.059	1.184	1.293	1.388	563.6035	6.6853	−8.5011	−13.6955	69.5041	−111.0175	71.4223
Methylene chloride	CH_2Cl_2	0.517	0.574	0.602	0.678	0.762	0.831	0.890	0.939	444.2757	5.5626	−2.8582	−16.0285	90.2509	−150.0431	98.4722
Chloroform	$CHCl_3$	0.477	0.528	0.550	0.606	0.661	0.703	0.735	0.762	432.3855	4.0882	0.0186	−4.9929	91.3991	−181.0173	132.7780
Carbon tetrachloride	CCl_4		0.526	0.544	0.586	0.620	0.642	0.657	0.668	404.6502	3.9042	1.4383	10.3685	120.5467	−291.2140	219.4177
Bromomethane	CH_3Br	0.392	0.429	0.448	0.507	0.580	0.643	0.699	0.748	582.5462	4.7518	−3.2915	−11.6866	71.7139	−119.4291	82.6436
Dibromomethane	CH_2Br_2	0.278	0.306	0.319	0.354	0.392	0.423	0.449	0.471	441.4487	5.5801	−1.4537	−16.0331	96.3766	−164.1834	108.8416
Tribromomethane	$CHBr_3$	0.253	0.273	0.281	0.304	0.326	0.344	0.357	0.368	444.2945	5.0879	3.2074	4.1568	101.0388	−218.2270	173.4973
Tetrabromomethane	CBr_4			0.275	0.288	0.300	0.308	0.312	0.315	708.6138	9.1392	6.7159	−4.8212	132.6970	−300.7419	213.9957
Chlorodifluoromethane (R22)	$CHClF_2$	0.557	0.62	0.65	0.733	0.827	0.902	0.960	1.006	923.7514	3.6501	1.0809	26.3036	33.6589	−138.0860	130.3725
Dichlorofluoromethane (R21)	$CHCl_2F$	0.511	0.568	0.594	0.661	0.731	0.785	0.828	0.863	448.3265	4.2561	0.0709	−8.4348	93.5761	−171.5023	122.5675
Chlorotrifluoromethane (R13)	$CClF_3$	0.542	0.611	0.642	0.720	0.798	0.852	0.892	0.921	530.6755	3.5003	0.9604	6.6125	106.4268	−228.0132	168.3566
Dichlorodifluoromethane (R12)	CCl_2F_2	0.517	0.578	0.604	0.668	0.729	0.770	0.799	0.821	546.7956	3.4416	1.5333	31.2296	71.5046	−234.2425	204.0779
Trichlorofluoromethane (R11)	CCl_3F	0.501	0.553	0.576	0.629	0.678	0.710	0.732	0.749	497.5032	4.6223	1.5688	3.0209	115.7598	−261.4310	192.6300
Ethyl fluoride (R161)	C_2H_5F	1.034	1.152	1.221	1.444	1.738	1.994	2.201	2.365	1291.3906	5.7586	−60.6316	−2.6539	39.8753	−99.0265	86.9333
Ethyl chloride	C_2H_5Cl		0.911	0.969	1.143	1.354	1.532	1.683	1.811	613.2333	6.9421	−3.7386	−19.7168	117.1200	−194.1976	126.2574
Ethyl bromide	C_2H_5Br		0.555	0.591	0.695	0.815	0.917	1.004	1.079	559.9347	4.6195	−1.4702	−13.3648	114.1759	−202.0764	146.4189
1,1-Dichloroethane	C_2H_4 $C_2H_4Cl_2$	0.647	0.729	0.771	0.887	1.019	1.125	1.211	1.284	544.1036	7.3477	−0.0939	−23.5320	146.8019	−247.1889	160.4226

D3.1. Table 6. (continued)

Substance	Formula	Temperature (°C)								Equation (10)						
		−50	0	25	100	200	300	400	500	*A*	*B*	*C*	*D*	*E*	*F*	*G*
1,2-Dichloroethane	$C_2H_4Cl_2$	0.693	0.749	0.783	0.890	1.023	1.134	1.226	1.301	405.3433	15.1092	20.1123	78.6790	−267.3812	327.7670	−148.4968
1,2-Dibromoethane	$C_2H_4Br_2$		0.437	0.454	0.510	0.580	0.637	0.684	0.724	520.5231	17.6437	4.0296	−44.3921	193.3612	−293.1946	165.7688
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$		0.875	0.929	1.076	1.239	1.370	1.475	1.561	787.7535	4.0477	1.6043	27.4029	120.4143	−334.2206	293.7670
1,1,1-Trichloroethane	$C_2H_3Cl_3$	0.588	0.658	0.691	0.780	0.874	0.945	1.001	1.047	502.9630	7.5393	1.5858	−21.3038	156.9331	−273.6844	179.7290
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$			0.589	0.667	0.748	0.807	0.852	0.886	593.3413	6.6303	1.6959	−10.3067	157.6395	−309.7356	215.3104
Pentachloroethane	C_2HCl_5	0.510	0.564	0.587	0.643	0.697	0.739	0.771	0.797	359.0845	5.8297	2.0795	−6.1565	163.1966	−336.2104	248.4292
Hexachloroethane	C_2Cl_6		0.569	0.590	0.637	0.676	0.701	0.720	0.734	388.1012	6.1294	1.8568	5.6538	139.7052	−321.6115	237.9069
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$			0.648	0.717	0.776	0.807	0.822	0.828	812.9972	8.3770	0.5771	9.2512	111.7561	−351.8827	296.9848
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$	0.557	0.619	0.647	0.720	0.791	0.841	0.876	0.902	554.3205	8.6962	2.2845	−10.0887	136.8359	−264.2738	178.3853
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$		0.654	0.686	0.770	0.853	0.910	0.948	0.973	618.1865	9.1614	2.9195	−16.9605	175.4260	−328.2318	208.3301
1-Chloropropane	C_3H_7Cl	0.890	1.012	1.080	1.287	1.533	1.739	1.912	2.062	450.2002	17.8443	0.8004	−41.5155	178.9604	−268.0433	153.8763
1-Chlorobutane	C_4H_9Cl	0.953	1.089	1.164	1.387	1.655	1.881	2.073	2.237	499.3815	16.9613	−1.4125	−35.0788	166.1639	−258.1227	155.7875
1-Chloropentane	$C_5H_{11}Cl$		1.136	1.222	1.465	1.748	1.988	2.193	2.369	634.3626	5.5185	−0.3864	4.5387	128.3503	−260.6794	221.9824
Chlorotrifluoroethene	C_2ClF_3				0.792	0.868	0.924	0.965	0.997	554.9252	6.3699	1.6592	−7.1911	107.4319	−205.1290	141.6516
Vinyl chloride	C_2H_3Cl	0.736	0.813	0.858	0.995	1.156	1.285	1.390	1.477	491.7027	10.6121	−5.5113	−24.6400	112.4196	−171.9770	100.5379
1,1-Dichloroethene	$C_2H_2Cl_2$	0.605	0.661	0.692	0.782	0.879	0.953	1.009	1.055	483.9491	12.1716	−4.7585	−25.0224	116.3062	−180.1138	104.3240
Trichloroethene	C_2HCl_3	0.529	0.584	0.609	0.676	0.741	0.788	0.823	0.851	451.8908	8.9582	−1.6449	−21.3433	117.8717	−193.6722	118.0824
Tetrachloroethene	C_2Cl_4	0.513	0.559	0.578	0.623	0.665	0.695	0.718	0.736	358.9475	4.8891	1.7481	4.5515	104.8901	−235.9012	182.2698
Fluorobenzene	C_6H_5F		0.900	0.985	1.227	1.503	1.727	1.906	2.051	646.6513	4.7333	−2.1501	−19.1687	195.8215	−342.9686	228.1173
Chlorobenzene	C_6H_5Cl		0.820	0.873	1.055	1.291	1.485	1.637	1.755	676.0917	20.3111	−6.9381	−36.9151	185.3827	−302.0124	178.2699
Bromobenzene	C_6H_5Br		0.584	0.627	0.764	0.928	1.062	1.168	1.253	508.8340	20.2369	2.7854	−48.4022	210.5292	−306.5724	167.8627
Iodobenzene	C_6H_5I		0.459	0.494	0.601	0.727	0.827	0.907	0.971	513.7413	18.0569	2.9747	−49.8646	225.0068	−333.4845	185.4410
m-Chlorotoluene	C_7H_7Cl			0.955	1.166	1.420	1.627	1.792	1.926	789.7233	11.4264	−17.9541	−15.6452	119.6219	−226.4380	155.1910
Benzyl chloride	C_7H_7Cl	0.586	0.709	0.773	0.954	1.159	1.321	1.451	1.556	522.1899	10.7951	−1.5160	−38.6145	205.2761	−324.2009	194.5097
***n*-Alkanes**																
Methane	CH_4			2.237	2.445	2.790	3.164	3.535	3.882	1530.8043	4.2038	−16.6150	−3.5668	43.0563	−86.5507	65.5986
Ethane	C_2H_6		1.651	1.748	2.059	2.481	2.873	3.220	3.520	1402.8537	4.3393	−13.6034	−2.2216	71.8248	−184.4821	162.4948
Propane	C_3H_8	1.358	1.566	1.676	2.009	2.437	2.822	3.158	3.447	1089.3798	4.7246	−1.1767	3.7776	129.3687	−281.4223	216.9425
n-Butane	C_4H_{10}	1.391	1.591	1.698	2.028	2.449	2.823	3.144	3.418	852.6025	7.9657	−2.6234	−13.9200	143.1800	−262.3816	183.6957
n-Pentane	C_5H_{12}		1.562	1.667	1.995	2.422	2.803	3.131	3.411	789.3078	10.6168	0.9888	−24.2821	191.4972	−315.5929	203.9787
n-Hexane	C_6H_{14}		1.551	1.657	1.988	2.413	2.788	3.108	3.377	752.9844	13.4279	1.5402	−29.6772	208.3733	−342.0902	217.4263
n-Heptane	C_7H_{16}		1.545	1.652	1.983	2.408	2.780	3.095	3.358	785.9090	14.6277	−1.8476	−21.5324	168.6597	−283.0262	181.4694
n-Octane	C_8H_{18}		1.538	1.645	1.979	2.405	2.774	3.083	3.339	662.4091	20.7046	4.6878	−40.7644	232.4401	−359.1133	215.4126
n-Nonane	C_9H_{20}		1.532	1.641	1.977	2.401	2.768	3.073	3.324	828.9112	18.2983	−7.0327	−19.5401	163.6825	−294.9747	195.6096
n-Decane	$C_{10}H_{22}$		1.528	1.638	1.976	2.400	2.764	3.066	3.315	807.8718	20.1071	−3.9883	−22.5527	184.3994	−327.2729	214.1176

n-Undecane	$C_{11}H_{24}$		1.543	1.647	1.975	2.389	2.746	3.047	3.303	527.8639	45.4181	14.2637	−55.4188	248.2431	−370.4082	213.9896
n-Dodecane	$C_{12}H_{26}$		1.523	1.634	1.974	2.397	2.760	3.059	3.303	844.1850	21.6766	2.1683	−25.2676	244.7925	−447.8236	295.3902
n-Tridecane	$C_{13}H_{28}$		1.520	1.634	1.981	2.399	2.749	3.042	3.293	474.4332	59.5849	22.6875	−66.2783	286.5523	−426.4025	241.9263
n-Tetradecane	$C_{14}H_{30}$		1.528	1.640	1.977	2.389	2.741	3.038	3.291	544.0586	42.6709	4.2513	−40.5758	203.7442	−317.2459	194.1666
n-Pentadecane	$C_{15}H_{32}$		1.518	1.632	1.981	2.400	2.748	3.038	3.285	499.0399	65.1836	8.3493	−48.4514	218.6957	−332.8050	192.8519
n-Hexadecane	$C_{16}H_{34}$		1.519	1.638	1.980	2.387	2.734	3.030	3.283	668.1744	18.2523	2.5022	−4.1518	177.7261	−329.3481	256.6324
n-Heptadecane	$C_{17}H_{36}$		1.527	1.638	1.974	2.385	2.735	3.031	3.282	578.0195	45.7412	5.8301	−39.9872	215.2157	−341.8782	213.0248
n-Octadecane	$C_{18}H_{38}$		1.526	1.637	1.974	2.384	2.733	3.027	3.279	536.1229	55.9070	9.8791	−44.9358	222.4113	−345.4429	210.0998
n-Nonadecane	$C_{19}H_{40}$		1.528	1.638	1.972	2.381	2.731	3.026	3.277	582.1373	49.4869	10.0892	−42.4034	230.8885	−366.4691	228.9834
n-Eicosane	$C_{20}H_{42}$	1.323	1.527	1.637	1.972	2.380	2.729	3.024	3.274	566.8372	54.1062	12.4032	−44.8725	237.4861	−374.5789	232.4371
Isoalkanes																
Isobutane	C_4H_{10}	1.326	1.551	1.667	2.016	2.453	2.838	3.166	3.442	1301.6129	5.3582	−3.2872	14.9841	121.8152	−370.6200	338.4127
2-Methyl butane	C_5H_{12}	1.287	1.532	1.653	2.002	2.428	2.807	3.142	3.436	796.3567	4.0740	1.8753	88.8118	−8.9551	−19.1416	144.6959
2,2-Dimethyl propane	C_5H_{12}	1.296	1.548	1.674	2.038	2.483	2.877	3.225	3.534	788.3550	5.1118	0.2138	14.9499	142.6273	−312.3498	289.4580
2-Methyl pentane	C_6H_{14}	1.286	1.529	1.651	2.008	2.442	2.819	3.142	3.418	1104.3653	6.0050	−0.6741	40.9931	79.5055	−276.2953	271.7875
3-Methyl pentane	C_6H_{14}	1.252	1.495	1.621	1.986	2.422	2.795	3.115	3.393	521.3512	13.5283	2.8620	−47.9590	267.2919	−436.4879	284.5608
2,2-Dimethyl butane	C_6H_{14}	1.274	1.509	1.635	2.007	2.456	2.844	3.180	3.477	516.5015	18.4334	3.0526	−50.8916	257.3425	−416.1133	262.7746
2,3-Dimethyl butane	C_6H_{14}	1.213	1.485	1.616	1.983	2.421	2.806	3.142	3.434	544.9676	20.1015	−0.2858	−34.4718	167.8659	−253.4422	152.8084
Olefins																
Ethylene	C_2H_4	1.308	1.449	1.530	1.792	2.137	2.443	2.707	2.934	765.3491	4.9341	−7.9136	−11.0137	74.3661	−127.7199	86.5313
Propylene	C_3H_6	1.267	1.441	1.532	1.810	2.168	2.490	2.768	3.005	1453.8112	4.3426	−6.0609	7.4494	78.9678	−249.5605	239.4544
1-Butene	C_4H_8	1.235	1.424	1.520	1.814	2.194	2.540	2.842	3.097	479.7773	4.3256	3.2718	58.5093	−95.3387	274.4396	26.8526
1-Pentene	C_5H_{10}	1.247	1.437	1.542	1.861	2.247	2.575	2.852	3.089	502.0995	16.7161	0.9681	−40.6210	189.9928	−289.8708	173.3031
1-Hexene	C_6H_{12}		1.454	1.569	1.890	2.268	2.594	2.876	3.118	518.3938	4.6055	−0.3015	3.6653	130.7511	−256.1823	235.6529
1-Heptene	C_7H_{14}		1.478	1.576	1.886	2.280	2.618	2.903	3.145	576.1412	24.8325	−1.5064	−36.2342	175.2815	−271.1906	162.1852
1-Octene	C_8H_{16}		1.460	1.569	1.900	2.301	2.635	2.911	3.142	498.9280	28.4670	10.9147	−62.5606	280.9159	−414.8178	236.4554
Propadiene	C_3H_4	1.221	1.384	1.472	1.723	2.008	2.241	2.437	2.607	465.8339	10.5594	−7.2102	−23.6194	112.3287	−177.9108	107.9555
1,2-Butadiene	C_4H_6	1.226	1.381	1.466	1.725	2.046	2.319	2.548	2.742	831.1926	7.9556	−123.6259	−1.1003	16.8009	−32.1157	26.9538
1,3-Butadiene	C_4H_6	1.144	1.357	1.470	1.800	2.172	2.465	2.696	2.885	504.8693	12.3472	−3.1700	−35.7105	172.8337	−267.9782	156.3704
1,2-Pentadiene	C_5H_8	1.206	1.383	1.479	1.766	2.112	2.404	2.652	2.865	502.0836	13.9603	5.1488	−56.7015	270.6766	−417.5797	251.6702
trans-1,3-Pentadiene	C_5H_8	1.169	1.355	1.454	1.745	2.092	2.385	2.634	2.850	472.2185	14.6639	0.2031	−38.6990	182.6697	−283.2016	172.1526
1,4-Pentadiene	C_5H_8	1.187	1.400	1.511	1.832	2.189	2.460	2.664	2.822	612.0521	11.1024	−0.1201	−42.4491	249.5228	−421.3161	255.7897
2,3-Pentadiene	C_5H_8	1.265	1.455	1.548	1.809	2.112	2.376	2.611	2.821	395.7408	14.3200	2.2651	−43.4952	207.7465	−335.7468	210.2750
Acetylene and derivatives																
Acetylene	C_2H_2		1.611	1.689	1.883	2.065	2.196	2.304	2.404	484.7405	5.5806	−12.0091	−11.2823	67.5455	−119.9447	79.3902
Propyne	C_3H_4	1.281	1.424	1.500	1.728	2.002	2.230	2.420	2.583	727.9002	6.1061	3.7308	−66.5183	462.2200	−863.7855	588.4012
2-Butyne	C_4H_6		1.363	1.435	1.670	1.969	2.232	2.462	2.664	435.9800	20.0593	3.1224	−42.6319	171.2131	−248.9928	140.1474
1-Butyne	C_4H_6	1.236	1.406	1.496	1.758	2.068	2.328	2.546	2.734	594.1889	8.2395	5.6383	−93.5136	553.0655	−936.2200	602.0223
Naphthenes																
Cyclopropane	C_3H_6		1.208	1.324	1.679	2.120	2.493	2.800	3.055	713.7107	5.4496	−10.9497	−15.5049	104.0811	−178.3456	116.5964

D3.1. Table 6. (continued)

Substance	Formula	Temperature (°C)								Equation (10)						
		−50	0	25	100	200	300	400	500	*A*	*B*	*C*	*D*	*E*	*F*	*G*
Cyclobutane	C_4H_8	0.951	1.140	1.248	1.598	2.057	2.459	2.792	3.062	930.8483	6.6039	2.5778	−89.4518	677.7646	−1285.7835	851.3535
Cyclopentane	C_5H_{10}		1.064	1.183	1.553	2.019	2.426	2.772	3.063	473.9844	12.2517	0.5415	−45.2376	197.8917	−275.7756	164.1954
Methyl cyclopentane	C_6H_{12}	0.983	1.188	1.302	1.662	2.122	2.519	2.851	3.125	791.7216	10.3687	−14.9347	−19.6640	139.2833	−244.4440	160.0311
Ethyl cyclopentane	C_7H_{14}	1.032	1.236	1.350	1.711	2.172	2.568	2.893	3.159	852.6188	12.3264	7.3838	−124.4888	900.0820	−1660.7870	1083.7922
Propyl cyclopentane	C_8H_{16}	1.095	1.289	1.399	1.748	2.198	2.588	2.910	3.173	879.8969	14.9509	7.5889	−92.9435	686.4537	−1278.7989	840.7984
Butyl cyclopentane	C_9H_{18}	1.055	1.285	1.409	1.776	2.212	2.580	2.891	3.157	510.2287	24.5355	−6.6885	−36.8382	182.9135	−287.1827	176.4629
Pentyl cyclopentane	$C_{10}H_{20}$		1.356	1.470	1.816	2.243	2.613	2.924	3.186	744.0656	15.0124	−2.5387	−23.5233	200.6802	−346.2344	230.7800
Hexyl cyclopentane	$C_{11}H_{22}$		1.384	1.494	1.833	2.259	2.625	2.933	3.192	651.5098	24.8279	4.4206	−45.1909	260.9829	−418.0936	259.0299
Cyclohexane	C_6H_{12}		1.132	1.262	1.651	2.138	2.568	2.936	3.245	1034.0205	2.2661	−9.7253	12.5999	83.1032	−176.0842	129.9521
Methyl cyclohexane	C_7H_{14}		1.261	1.380	1.755	2.232	2.648	2.997	3.287	700.0371	13.0168	−3.3396	−33.5298	208.2013	−329.5953	202.0251
Ethyl cyclohexane	C_8H_{16}		1.300	1.417	1.793	2.266	2.669	3.006	3.288	494.0977	37.1700	−3.2420	−40.6508	172.9927	−249.9383	140.6195
Propyl cyclohexane	C_9H_{18}		1.353	1.463	1.825	2.290	2.687	3.015	3.288	552.0598	40.0743	−1.2145	−43.5560	193.6083	−286.0221	161.3476
Butyl cyclohexane	$C_{10}H_{20}$			1.485	1.836	2.292	2.687	3.015	3.287	676.3415	28.9482	−2.9127	−39.5752	211.5104	−334.3413	199.5951
Pentyl cyclohexane	$C_{11}H_{22}$		1.377	1.496	1.855	2.301	2.687	3.013	3.285	813.5232	13.5351	−1.2542	−15.0986	213.1065	−381.0515	259.5647
Hexyl cyclohexane	$C_{12}H_{24}$		1.398	1.515	1.869	2.309	2.692	3.015	3.285	851.9134	15.6834	−6.0321	−11.2562	167.7792	−308.2092	211.9792
Cyclopentene	C_5H_8	0.875	1.079	1.192	1.533	1.943	2.286	2.571	2.810	524.2790	12.7122	−6.6494	−32.6534	158.5544	−243.7381	146.0656
Cyclohexene	C_6H_{10}	0.898	1.115	1.233	1.586	2.010	2.365	2.663	2.914	481.0918	16.5468	1.9341	−54.6373	249.2469	−373.4469	218.8272
Aromatic compounds																
Benzene	C_6H_6		0.956	1.055	1.349	1.703	1.991	2.212	2.373	809.7723	3.7727	−3.6189	−9.0633	149.9616	−223.5093	99.7303
Toluene	C_7H_8	0.839	1.029	1.127	1.417	1.767	2.061	2.302	2.499	841.2618	5.3563	−8.1268	−8.4229	132.4066	−258.0367	181.8666
Ethyl benzene	C_8H_{10}		1.102	1.201	1.498	1.859	2.160	2.405	2.604	908.5227	7.9010	−9.1146	−12.9499	165.9928	−343.4212	248.2148
Propyl benzene	C_9H_{12}		1.161	1.264	1.565	1.926	2.229	2.475	2.674	1950.0270	5.3147	−37.4089	24.6757	−9.7945	−173.2279	305.2206
Butyl benzene	$C_{10}H_{14}$		1.193	1.295	1.604	1.975	2.285	2.543	2.759	485.2103	29.2013	7.1705	−55.8817	250.3890	−371.2898	213.7531
Pentyl benzene	$C_{11}H_{16}$	1.037	1.220	1.323	1.636	2.016	2.329	2.584	2.796	753.8201	23.4443	−425.7090	−1.9835	20.1155	−37.1862	29.4457
Hexyl benzene	$C_{12}H_{18}$		1.257	1.357	1.662	2.038	2.357	2.621	2.839	775.6700	16.7476	7.0631	−47.8570	404.9666	−713.9274	462.9704
o-Xylene	C_8H_{10}		1.151	1.249	1.529	1.857	2.137	2.375	2.579	609.8388	5.3273	−0.3832	−3.6723	168.1564	−306.0474	244.1396
m-Xylene	C_8H_{10}	0.899	1.086	1.185	1.479	1.829	2.122	2.366	2.572	524.8743	14.4547	2.1723	−49.8936	255.6358	−395.9105	241.3380
p-Xylene	C_8H_{10}	0.895	1.083	1.182	1.475	1.826	2.121	2.366	2.573	554.5575	12.5185	1.7380	−47.3879	260.5644	−409.1711	253.7921
1,2,3-Trimethyl benzene	C_9H_{12}	1.056	1.232	1.324	1.597	1.929	2.215	2.458	2.666	552.6305	14.7160	6.4505	−50.8017	292.8565	−458.6487	296.1082
1,2,4-Trimethyl benzene	C_9H_{12}	1.017	1.193	1.284	1.554	1.884	2.170	2.417	2.630	531.4374	13.9593	−1.2014	−26.5814	156.1717	−248.3199	167.1423
1,3,5-Trimethyl benzene	C_9H_{12}	0.957	1.139	1.236	1.528	1.878	2.168	2.410	2.615	759.3563	14.4362	−307.7057	−1.3812	17.7781	−33.6487	27.8002
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$	1.126	1.305	1.397	1.668	1.996	2.278	2.519	2.726	569.2235	15.7579	5.5793	−36.6740	237.6957	−384.0478	257.8036
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$	1.075	1.252	1.346	1.623	1.955	2.240	2.486	2.699	425.1269	29.6833	10.6318	−59.1867	258.9429	−389.8433	231.4145
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$	1.107	1.275	1.364	1.633	1.962	2.248	2.494	2.706	496.9808	21.4489	10.2592	−59.7259	294.1429	−449.9035	282.1546
Pentamethyl benzene	$C_{11}H_{16}$	1.174	1.358	1.453	1.730	2.062	2.345	2.587	2.793	518.4634	20.1576	9.4405	−50.8594	287.9065	−455.8520	296.4273
Hexamethyl benzene	$C_{12}H_{18}$	1.221	1.414	1.512	1.793	2.125	2.406	2.645	2.850	503.3786	22.0085	5.6201	−36.1051	211.8811	−343.8426	227.8486
Styrene	C_8H_8		1.091	1.178	1.445	1.767	2.033	2.250	2.427	614.9612	14.2195	1.6222	−45.1906	248.7041	−395.9648	237.9188

Isopropyl benzene	C_9H_{12}		1.162	1.258	1.557	1.926	2.231	2.479	2.683	541.8872	28.4457	5.2895	−54.7513	249.1932	−373.2738	210.7473
Biphenyl	$C_{12}H_{10}$	0.783	0.928	1.021	1.323	1.695	1.984	2.197	2.357	839.2611	29.0956	−840.9403	−1.7659	18.1764	−34.5202	27.6537
diphenyl methane	$C_{13}H_{12}$	0.763	0.980	1.083	1.373	1.704	1.975	2.195	2.376	912.0247	0.3789	−7.3276	68.9251	−6.9247	−117.1357	156.2244
Triphenyl methane	$C_{19}H_{16}$				1.322	1.648	1.917	2.136	2.315	693.7541	12.2683	−1.5320	−26.8670	285.6544	−503.9054	335.7974
Tetraphenyl methane	$C_{25}H_{20}$				1.317	1.645	1.913	2.129	2.306	704.0798	11.6368	−13.1994	−10.6609	180.0007	−329.3314	227.2214
Naphthalene	$C_{10}H_8$	0.741	0.933	1.030	1.310	1.633	1.896	2.107	2.278	810.0175	5.4557	−126.8803	−0.3906	20.9245	−42.2188	34.6214
1-Methylnaphthalene	$C_{11}H_{10}$	0.824	1.006	1.103	1.394	1.734	2.000	2.198	2.346	737.4298	13.6993	4.6727	−76.5654	524.0127	−924.2788	562.5966
2-Methylnaphthalene	$C_{11}H_{10}$			1.122	1.397	1.719	1.984	2.200	2.378	692.3897	7.8093	−0.1056	−21.8522	268.0494	−481.6940	328.2843
1-Ethylnaphthalene	$C_{12}H_{12}$			1.178	1.464	1.797	2.069	2.291	2.472	688.2104	9.5394	−3.1238	−18.5037	207.2486	−373.2825	253.7499
2-Ethylnaphthalene	$C_{12}H_{12}$			1.180	1.460	1.787	2.057	2.278	2.460	701.0440	9.2404	−1.2002	−16.7838	224.0503	−407.6486	281.3767
Alcohols																
Methanol	CH_4O		1.328	1.376	1.545	1.795	2.035	2.253	2.445	846.6321	5.7309	−4.8842	−12.8501	78.9997	−127.3725	82.7107
Ethanol	C_2H_6O		1.524	1.599	1.827	2.115	2.372	2.596	2.791	615.0622	7.4449	10.6424	39.8445	−229.0321	358.5449	−228.5963
1-Propanol	C_3H_8O	1.169	1.338	1.431	1.708	2.045	2.336	2.586	2.804	506.0032	12.1539	0.0041	−36.1389	175.9466	−276.1927	171.3886
1-Butanol	$C_4H_{10}O$	1.167	1.354	1.456	1.765	2.133	2.440	2.699	2.920	492.3989	18.1172	0.2036	−41.5543	192.4340	−295.5686	175.0644
1-Pentanol	$C_5H_{12}O$	1.186	1.375	1.481	1.799	2.175	2.486	2.746	2.967	456.0466	26.3377	5.3197	−51.8114	223.3194	−331.4368	188.1740
1-Hexanol	$C_6H_{14}O$		1.413	1.515	1.816	2.179	2.492	2.760	2.989	539.7646	13.6357	−2.5712	−21.6173	133.0466	−212.0847	143.2168
1-Heptanol	$C_7H_{16}O$		1.406	1.514	1.839	2.227	2.547	2.810	3.031	472.7577	32.1074	12.4362	−65.6487	284.9801	−418.5724	235.1440
1-Octanol	$C_8H_{18}O$		1.434	1.539	1.847	2.220	2.541	2.814	3.046	473.5372	21.6301	3.8006	−36.3164	182.8327	−277.2652	176.9866
Isopropanol	C_3H_8O	1.186	1.389	1.492	1.783	2.114	2.389	2.624	2.826	418.8801	14.1696	−1.4167	−36.6301	168.5334	−261.1031	156.5725
2-Methyl-1-propanol	$C_4H_{10}O$				1.766	2.118	2.427	2.690	2.913	798.5957	9.0864	1.3782	−21.1202	195.9087	−342.6424	230.5518
3-Methyl-1-butanol	$C_5H_{12}O$			1.483	1.794	2.155	2.464	2.729	2.957	551.4814	3.6966	−0.0476	15.9099	144.3529	−303.3896	290.0544
Ethylene glycol	$C_2H_6O_2$				1.454	1.705	1.924	2.111	2.271	710.7946	6.0109	1.5905	−11.3311	139.2296	−234.0852	165.8867
1,3-Propylene glycol	$C_3H_8O_2$				1.539	1.835	2.084	2.284	2.446	764.0921	18.9126	−9.9306	−31.5200	172.4209	−303.9785	193.8688
Glycerol	$C_3H_8O_3$			1.251	1.450	1.705	1.917	2.087	2.226	830.0781	16.2564	−11.1044	−25.4696	162.1117	−309.8217	212.4448
Cyclohexanol	$C_6H_{12}O$			1.325	1.633	2.036	2.401	2.711	2.964	335.6044	3.1522	−2.1230	29.3992	−48.7158	11.4720	130.4559
Benzyl alcohol	C_7H_8O			1.033	1.303	1.630	1.900	2.118	2.296	806.5585	9.1764	−22.3177	−13.5166	111.0271	−211.6739	146.7900
Phenols																
o-Cresol	C_7H_8O		1.084	1.180	1.442	1.736	1.977	2.176	2.341	781.3184	1.5589	−4.2264	52.1150	−23.7416	−39.2506	93.9738
m-Cresol	C_7H_8O		1.050	1.154	1.432	1.734	1.976	2.173	2.337	711.0546	−1.1668	−7.9357	48.3832	−20.0224	−58.0273	111.3934
p-Cresol	C_7H_8O		1.054	1.151	1.418	1.717	1.961	2.162	2.332	493.7805	6.6781	−4.1148	−23.5492	172.1028	−293.9660	200.9190
Phenol	C_6H_6O	0.817	1.015	1.108	1.359	1.637	1.867	2.060	2.222	344.0544	12.3852	−3.4905	−38.7742	183.2357	−287.4124	175.9400
Carboxylic acids																
Formic acid	CH_2O_2	0.859	0.947	0.992	1.132	1.314	1.479	1.621	1.741	1422.9543	3.5792	−2.8439	8.3366	48.7114	−138.2338	113.0764
Acetic acid	$C_2H_4O_2$	0.858	0.987	1.054	1.254	1.501	1.716	1.899	2.054	608.8356	5.1040	0.3115	−18.4327	135.3287	−205.9415	138.0387
Propionic acid	$C_3H_6O_2$			1.211	1.446	1.699	1.904	2.079	2.231	457.0683	5.1709	−3.4822	−24.0638	172.4621	−312.7397	215.4305
Butyric acid	$C_4H_8O_2$			1.312	1.541	1.812	2.043	2.237	2.398	459.6913	5.9009	4.0620	3.9149	181.7266	−291.7462	291.5314
Valeric acid	$C_5H_{10}O_2$			1.349	1.599	1.888	2.134	2.342	2.521	514.8584	6.6566	2.2909	−9.1907	194.6026	−358.7199	290.3090
Caproic acid	$C_6H_{12}O_2$			1.386	1.647	1.946	2.200	2.416	2.602	451.7423	7.1043	−2.0512	−11.4873	139.7141	−261.2768	206.1596
Acetic anhydride	$C_4H_6O_3$		0.908	0.977	1.189	1.446	1.659	1.831	1.973	539.2754	16.7548	−0.7395	−39.4099	184.3347	−277.7276	159.5938

D3.1. Table 6. (continued)

Substance	Formula	Temperature (°C)								Equation (10)						
		−50	0	25	100	200	300	400	500	*A*	*B*	*C*	*D*	*E*	*F*	*G*
Propionic anhydride	$C_6H_{10}O_3$			1.161	1.409	1.677	1.898	2.085	2.244	532.8036	−3.1593	−10.1506	49.8107	−27.4669	−59.7251	135.5787
Chloroacetic acid	$C_2H_3ClO_2$			0.823	0.952	1.093	1.205	1.296	1.371	513.1194	5.0317	0.1128	−13.7464	135.2842	−240.6474	169.3052
Dichloroacetic acid	$C_2H_2Cl_2O_2$				0.792	0.876	0.947	1.005	1.051	817.0589	10.0416	4.6688	−22.0572	170.5135	−302.1516	192.3847
Trichloroacetic acid	$C_2HCl_3O_2$				0.737	0.810	0.863	0.904	0.935	576.9782	8.1143	3.1010	−8.6521	139.2451	−275.8220	193.3559
Ketones																
Ketene	C_2H_2O	0.993	1.097	1.149	1.297	1.462	1.596	1.711	1.811	468.8498	6.9008	−5.6398	−17.1500	88.2773	−144.6588	91.7470
Acetone	C_3H_6O	1.092	1.216	1.286	1.505	1.792	2.049	2.270	2.458	705.8948	7.7263	0.4677	−23.3910	148.3440	−229.3625	144.1393
Methyl ethyl ketone	C_4H_8O	1.210	1.344	1.420	1.655	1.950	2.210	2.436	2.632	482.3897	15.6860	4.3811	−42.2777	189.9671	−285.2067	172.9528
Diethyl ketone	$C_5H_{10}O$	1.286	1.434	1.509	1.737	2.030	2.296	2.532	2.735	1765.2345	9.0644	−1.5515	40.2552	−22.0621	−74.5494	104.5099
Dipropyl ketone	$C_7H_{14}O$	1.288	1.449	1.534	1.792	2.118	2.406	2.651	2.857	735.3618	14.3567	9.4665	−32.5304	310.8597	−478.7656	302.7430
Acetophenone	C_8H_8O			0.940	1.174	1.472	1.731	1.946	2.121	763.6426	10.1937	−2.3585	−29.5326	204.0248	−329.8159	198.9534
Benzophenone	$C_{13}H_{10}O$				1.232	1.528	1.774	1.976	2.140	733.7134	6.6859	−0.9461	−4.1615	224.2713	−394.9366	268.1667
Ethers																
Dimethyl ether	C_2H_6O	1.221	1.353	1.426	1.656	1.950	2.217	2.459	2.675	465.9073	10.4329	−2.4883	−24.9240	115.5549	−180.8060	116.0588
Diethyl ether	$C_4H_{10}O$	1.391	1.523	1.598	1.841	2.172	2.464	2.701	2.894	2983.3712	10.7009	−42.8010	−5.8344	309.3391	−1779.9754	3121.8402
Dipropyl ether	$C_6H_{14}O$		1.466	1.553	1.825	2.179	2.497	2.771	3.004	705.4836	15.9106	6.9763	−38.3882	243.6142	−372.7539	231.0957
Methyl propyl ether	$C_4H_{10}O$			1.519	1.771	2.102	2.404	2.668	2.896	882.1014	9.7244	0.6484	−12.9184	142.8094	−245.9753	166.8905
Ethyl propyl ether	$C_5H_{12}O$			1.535	1.803	2.151	2.465	2.739	2.973	1138.2872	9.6137	1.3570	5.9532	147.9699	−323.5530	242.4878
Ethylene oxide	C_2H_4O	0.872	1.012	1.091	1.334	1.637	1.896	2.113	2.294	634.8610	5.7870	−8.5443	−15.4287	89.6330	−144.6410	92.4648
Furane	C_4H_4O		0.871	0.960	1.222	1.518	1.749	1.931	2.079	486.3671	12.0372	−4.5658	−36.8218	170.9486	−259.5831	148.5210
1,4-Dioxane	$C_4H_8O_2$		0.953	1.046	1.326	1.667	1.956	2.198	2.403	484.0338	15.6011	−0.2760	−44.0774	198.9436	−295.1276	172.8842
Aldehydes																
Formaldehyde	CH_2O	1.119	1.157	1.182	1.272	1.415	1.565	1.708	1.835	1636.6439	4.0763	−17.0910	−2.4580	38.3216	−87.5064	71.7045
Acetaldehyde	C_2H_4O	1.094	1.195	1.253	1.435	1.676	1.895	2.088	2.256	586.5086	6.5867	0.0587	−20.9195	110.1906	−164.8871	107.6335
Paraldehyde	$C_6H_{12}O_3$				1.415	1.792	2.085	2.296	2.450	773.1687	27.7745	−44.6451	−25.3175	148.3349	−268.2676	171.6125
Furfural	$C_5H_4O_2$	0.791	0.949	1.026	1.238	1.475	1.668	1.824	1.951	413.7560	7.7545	1.2143	−39.4944	214.9979	−331.8139	211.2817
Benzaldehyde	C_7H_6O		0.971	1.054	1.298	1.584	1.817	2.004	2.154	671.1861	8.3938	−1.9508	−26.9338	201.7159	−344.2504	219.1408
Salicylaldehyde	$C_7H_6O_2$				1.328	1.607	1.836	2.020	2.168	669.6069	5.1161	0.0212	3.1101	172.7490	−303.1054	213.6292
Esters																
Methyl formate	$C_2H_4O_2$		1.039	1.105	1.295	1.521	1.710	1.867	1.999	650.0705	5.0360	−0.4487	−13.5453	126.9502	−219.5695	151.4586
Ethyl formate	$C_3H_6O_2$	0.998	1.137	1.204	1.396	1.638	1.861	2.064	2.242	404.9129	3.7636	0.9389	10.0507	93.3832	−253.2640	280.9690
Propyl formate	$C_4H_8O_2$			1.249	1.498	1.793	2.035	2.232	2.395	648.4015	11.8633	−2.9629	−29.6799	181.7404	−312.5326	200.3552
Methyl acetate	$C_3H_6O_2$			1.147	1.342	1.591	1.817	2.014	2.183	1067.5571	5.8357	3.3580	24.4866	171.0516	−317.8321	204.6031
Ethyl acetate	$C_4H_8O_2$		1.238	1.290	1.485	1.763	2.012	2.219	2.386	750.2984	19.6540	−1.2186	−36.4137	186.0861	−297.5340	174.1510
Propyl acetate	$C_5H_{10}O_2$			1.330	1.565	1.849	2.099	2.313	2.496	468.6307	6.3075	4.6248	25.2463	171.5921	−323.6548	393.4110

Methyl propionate	$C_4H_8O_2$				1.534	1.817	2.037	2.218	2.374	511.6446	8.3735	−3.5348	−32.5843	210.7834	−374.4899	246.1545
Ethyl propionate	$C_5H_{10}O_2$				1.579	1.887	2.134	2.335	2.503	573.7088	7.7317	−1.7971	−24.4531	206.2430	−371.7278	254.3115
Propyl propionate	$C_6H_{12}O_2$			1.335	1.627	1.948	2.202	2.411	2.588	578.4427	8.0466	−10.2830	−14.6931	135.7510	−254.7277	179.9220
Methyl butyrate	$C_5H_{10}O_2$			1.318	1.592	1.889	2.127	2.327	2.499	481.5596	7.2303	−4.7969	−24.3266	182.1370	−329.2853	227.0399
Ethyl butyrate	$C_6H_{12}O_2$			1.341	1.624	1.942	2.199	2.411	2.590	611.9893	8.3737	−6.7042	−12.5524	135.5255	−253.6930	181.7482
Methyl benzoate	$C_8H_8O_2$				1.143	1.433	1.675	1.867	2.020	777.6575	19.3345	−21.9744	−26.0082	154.6223	−274.4153	175.8682
Ethyl benzoate	$C_9H_{10}O_2$				1.215	1.520	1.771	1.972	2.136	746.8498	13.3061	−3.6685	−38.3335	264.3178	−475.3466	308.6488
Methyl salicylate	$C_8H_8O_3$				1.173	1.435	1.648	1.818	1.954	731.4071	11.4812	−1.4487	−32.3335	247.6723	−444.5874	288.4964
Amines																
Methyl amine	CH_5N	1.450	1.618	1.710	1.988	2.317	2.596	2.834	3.043	526.2987	8.1347	−6.7634	−19.4168	99.1609	−161.5452	102.4923
Ethyl amine	C_2H_7N		1.530	1.615	1.895	2.258	2.577	2.851	3.087	536.5039	13.9460	−0.9874	−33.9284	152.3293	−230.0192	135.6922
Propyl amine	C_3H_9N		1.529	1.621	1.916	2.288	2.610	2.884	3.121	485.4942	20.2338	1.8071	−40.8876	174.7357	−258.6134	148.6605
n-Butyl amine	$C_6H_{15}N$		1.524	1.616	1.913	2.294	2.623	2.904	3.144	521.8162	22.5154	3.3114	−43.2202	190.4295	−283.4029	163.9525
Dimethyl amine	C_2H_7N		1.480	1.572	1.869	2.248	2.579	2.862	3.104	517.1446	13.7294	−1.4905	−33.7718	150.1642	−224.7214	131.9666
Trimethyl amine	C_3H_9N		1.448	1.556	1.880	2.281	2.628	2.923	3.173	556.5448	8.8001	1.0661	−31.1281	176.1563	−265.6208	170.2390
Diethyl amine	$C_4H_{11}N$		1.489	1.584	1.889	2.279	2.618	2.907	3.154	481.9254	24.4069	7.0965	−51.6239	214.2465	−308.3217	173.5640
Triethyl amine	$C_6H_{15}N$		1.488	1.584	1.902	2.307	2.654	2.945	3.191	471.8903	40.9534	6.6919	−46.2079	186.7660	−265.4862	145.4154
Piperidine	$C_5H_{11}N$				1.843	2.279	2.641	2.921	3.132	789.5315	14.3328	−7.2974	−28.8283	185.2647	−313.8948	186.7509
Pyridine	C_6H_7N		0.895	0.992	1.261	1.567	1.816	2.020	2.187	931.3885	−0.2894	−4.7426	61.0122	−41.5212	−31.1320	87.8622
Aniline	C_6H_7N	0.906	1.096	1.192	1.467	1.779	2.027	2.226	2.389	553.0789	10.0504	−2.1951	−33.8931	200.8168	−328.5051	204.3701
N-methyl aniline	C_7H_9N				1.468	1.808	2.080	2.300	2.479	617.5389	4.7482	−4.0307	−16.4466	192.1456	−342.6990	234.9554
N,*N*-dimethyl aniline	$C_8H_{11}N$				1.454	1.820	2.120	2.366	2.565	588.2014	2.5877	−2.6448	−3.1347	202.5766	−325.4600	235.2223
N,*N*-diethyl aniline	$C_{10}H_{15}N$				1.542	1.922	2.233	2.486	2.693	695.7592	8.7586	−8.2134	−16.8824	178.2587	−319.5727	215.8269
Phenylhydrazine	$C_6H_8N_2$				1.417	1.724	1.968	2.163	2.321	596.7362	3.9280	−2.2980	−14.6956	225.7757	−416.3451	292.5245
Diphenyl amine	$C_{12}H_{11}N$				1.334	1.666	1.932	2.144	2.315	705.0600	5.5301	−7.3743	−12.6309	204.7976	−387.7767	268.3223
Nitriles																
Acetonitrile	C_2H_3N	1.119	1.218	1.271	1.435	1.642	1.827	1.989	2.132	575.7440	5.8067	−0.7216	−15.8722	92.6961	−149.0017	101.9069
Propionitrile	C_3H_5N	1.115	1.260	1.337	1.562	1.827	2.051	2.244	2.413	467.1284	11.0885	−1.3805	−31.1335	148.5534	−234.2472	144.0482
Butyronitrile	C_4H_7N	1.168	1.336	1.423	1.677	1.973	2.221	2.431	2.610	495.5976	11.9010	4.4644	−53.0329	268.1488	−426.2804	263.2369
Benzonitrile	C_7H_5N	0.832	0.977	1.056	1.288	1.556	1.770	1.942	2.081	486.6942	17.2633	2.8971	−49.4846	226.3075	−336.3367	190.1459
Amides																
Formamide	CH_3NO			1.020	1.187	1.412	1.612	1.781	1.922	771.4776	6.0800	−8.0917	−13.8793	84.4610	−140.6239	89.9474
Nitroderivates																
Nitromethane	CH_3NO_2	0.788	0.877	0.927	1.086	1.292	1.468	1.612	1.726	1055.4685	5.3794	−10.9553	−8.2607	88.4218	−187.4973	138.2815
Nitrobenzene	$C_6H_5NO_2$			1.044	1.201	1.424	1.620	1.777	1.901	766.3016	22.4706	0.2908	−41.1361	213.1554	−347.2088	202.9334
o-Nitrotoluene	$C_7H_7NO_2$			1.096	1.268	1.510	1.724	1.899	2.039	815.1681	23.1378	1.0993	−41.1763	228.3301	−381.3986	227.7271
m-Nitrotoluene	$C_7H_7NO_2$			1.096	1.268	1.510	1.724	1.899	2.039	815.1681	23.1378	1.0993	−41.1763	228.3301	−381.3986	227.7271
p-Nitrotoluene	$C_7H_7NO_2$			1.096	1.268	1.510	1.724	1.899	2.039	815.1681	23.1378	1.0993	−41.1763	228.3301	−381.3986	227.7271

D3.1. Table 7. Dynamic viscosity of saturated liquids in mPa s

Substance	Formula	Temperature (°C)								Equation (2)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Elements														
Xenon	Xe	0.23	0.16	0.11						0.55314	−37.82854	164.800	−1106.936	0.00050739
Krypton	Kr									1.20479	0.60580	216.325	2.278	0.00008756
Argon	Ar									2.92010	3.51821	151.048	−164.493	0.00002311
Air										2.22755	0.49596	132.897	4.000	0.00001638
Nitrogen	N_2									2.23392	0.01273	127.145	36.807	0.00001343
Oxygen	O_2									2.14927	0.00116	157.423	36.005	0.00001839
Fluorine	F_2									3.79391	2.18842	331.029	−177.692	0.00000080
Chlorine	Cl_2	0.56	0.46	0.39	0.34	0.30	0.24			0.48281	1.35353	439.327	−110.083	0.00017187
Bromine	Br_2			1.25	1.02	0.77				3.19074	1.61660	499.481	−209.817	0.00005839
Iodine	I_2							1.78	1.28	3.26629	2.09143	793.019	−407.779	0.00007227
Anorganic compounds														
Hydrogen fluoride	HF	0.56	0.36	0.26						0.52901	0.61638	475.848	81.999	0.00007721
Hydrogen chloride	HCl		0.14	0.11	0.08					6.63052	−0.88397	445.763	72.787	0.00000041
Hydrogen bromide	HBr	0.55	0.39	0.28	0.21	0.14				4.16618	0.00407	382.714	11.651	0.00001234
Hydrogen iodide	HI	1.46	1.08	0.81	0.64	0.45	0.23	0.09		5.17952	−0.00350	446.147	−81.737	0.00001373
Hydrogen cyanide	HCN			0.24	0.19					0.59249	1.74862	394.903	−1.249	0.00008283
Water	H_2O				1.01	0.56	0.28	0.18	0.13	0.45047	1.39753	613.181	63.697	0.00006896
Hydrogen sulfide	H_2S	0.37	0.25	0.17	0.12	0.07				5.74095	−0.46553	425.493	98.235	0.00000105
Ammonia	NH_3	0.33	0.23	0.17	0.14	0.10	0.06			0.76099	6.53802	373.726	−304.733	0.00005863
Nitric oxide	NO									7.22569	−0.17859	202.500	−106.123	0.00000172
Nitrogen Dioxide	NO_2			0.53	0.43	0.30	0.14			6.86768	−0.14884	423.463	−446.706	0.00000919
Nitrous oxide	N_2O	0.17	0.12	0.09						3.47166	2.50311	379.730	−222.126	0.00000792
Dinitrogentetroxide	N_2O_4			0.53	0.43					−0.03739	0.96651	615.987	11.286	0.00013891
Cyanogen	C_2N_2		19.29	3.09	0.91					1.47085	5.11957	729.566	−34.528	0.00000010
Phosphorus trichloride	PCl_3	1.22	0.87	0.66	0.55	0.44				0.41897	0.69273	676.023	−10.272	0.00013570
Cyanogen chloride	ClCN			0.78						0.85260	1.26974	632.123	−38.108	0.00006912
Silane	SiH_4	0.07								0.61446	0.39805	505.030	−16.673	0.00002342
Tetrachlorosilane	$SiCl_4$			0.56	0.47	0.37	0.25	0.17		2.64937	4.43604	883.209	−795.200	0.00000763
Carbon monoxide	CO									1.12644	1.20497	177.745	−40.077	0.00002545
Carbon dioxide	CO_2	0.23	0.15	0.10	0.07					2.68801	4.19607	305.198	−186.836	0.00002914
Carbon suboxide	C_3O_2	2.00	1.18	0.76	0.57	0.39	0.24	0.17		1.36451	1.23603	651.929	−33.959	0.00003443
Carbonyl sulfide	COS	0.33								1.09689	1.29173	344.677	−34.000	0.00008662

Phosgene	CCl_2O			0.59						2.05445	0.57499	405.660	−78.105	0.00011430
Carbon disulfide	CS_2	0.96	0.60	0.44	0.36					−1.21697	2.07022	423.015	16.676	0.00044103
Sulfur dioxide	SO_2		0.53	0.38	0.29	0.19	0.10			11.30591	4.76771	588.187	−978.880	0.00000014
Sulfur trioxide	SO_3				2.19					1.05142	1.92462	680.960	61.410	0.00001373
Sulfuryl chloride	Cl_2SO_2			0.91	0.73	0.55				0.89331	0.87316	742.201	−42.953	0.00007532
Sulfur hexafluoride	SF_6	0.54	0.42	0.34	0.29					1.61414	2.05898	451.978	−219.147	0.00006271
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	0.50	0.38	0.30						0.95210	0.76506	550.522	−25.991	0.00005879
Ethyl mercaptan	C_2H_6S	0.67	0.48	0.36	0.30					−0.01119	1.88058	472.369	−65.473	0.00014524
Dimethyl sulfide	C_2H_6S		0.48	0.36	0.29					0.72488	0.86931	589.869	−12.293	0.00006185
Diethyl sulfide	$C_4H_{10}S$		0.78	0.56	0.45	0.33				1.53683	1.21439	583.673	−63.530	0.00004208
Thiophene	C_4H_4S			0.87	0.66	0.47	0.30			0.41152	1.31563	668.146	−36.622	0.00009023
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	0.21								−1.76244	6.54755	277.164	−206.901	0.00033288
Difluoromethane (R32)	CH_2F_2	0.37	0.26	0.19						2.02991	0.63260	324.135	42.295	0.00005219
Trifluoromethane (R23)	CHF_3	0.21	0.16							0.72088	2.00276	267.675	−32.095	0.00011482
Tetrafluoromethane (R14)	CF_4	0.16								1.28783	0.76244	405.676	−14.981	0.00002872
Methyl chloride	CH_3Cl	0.46	0.31	0.22	0.18	0.14	0.09			0.67544	2.38486	379.438	−35.279	0.00007741
Methylene chloride	CH_2Cl_2	1.07	0.73	0.53	0.43	0.33	0.24			0.85505	0.90417	608.752	−18.795	0.00007319
Chloroform	$CHCl_3$	1.50	0.99	0.71	0.57	0.43				0.61822	0.98765	660.257	−29.324	0.00009188
Carbon tetrachloride	CCl_4			1.31	0.96	0.64	0.38	0.26		0.83033	2.29078	562.119	−73.328	0.00009929
Bromomethane	CH_3Br	0.65	0.49	0.38						0.58164	1.14346	527.197	−56.840	0.00010019
Dibromomethane	CH_2Br_2		1.93	1.33	1.04	0.77				2.55875	−0.00001	884.158	142.141	0.00001849
Tribromomethane	$CHBr_3$				1.99	1.39	0.88			1.18800	0.70521	870.903	−15.622	0.00009053
Tetrabromomethane	CBr_4						0.25	0.13	0.08	0.71298	1.97356	549.836	121.421	0.00003942
Chlorodifluoromethane (R22)	$CHClF_2$	0.32	0.25	0.20	0.16	0.12				2.50542	0.00079	369.199	56.279	0.00002948
Dichlorofluoromethane (R21)	$CHCl_2F$	0.72	0.52	0.40	0.33	0.26	0.19	0.13		1.10954	1.04245	429.188	−2.978	0.00009772
Chlorotrifluoromethane (R13)	$CClF_3$	0.22	0.17							0.76360	1.63878	278.217	−10.329	0.00010624
Dichlorodifluoromethane (R12)	CCl_2F_2	0.43	0.32	0.24	0.19	0.14				2.23435	96.51808	363.171	−3940.344	0.00007311
Trichlorofluoromethane (R11)	CCl_3F	0.98	0.72	0.53	0.42	0.31	0.18			1.85826	74.83744	443.154	−3365.675	0.00007753
Ethyl fluoride (R161)	C_2H_5F	0.24								−2.84655	2.06943	550.110	−106.565	0.00052565
Ethyl chloride	C_2H_5Cl	0.58	0.42	0.32	0.26	0.20				2.32681	0.36985	448.229	35.146	0.00003041
Ethyl bromide	C_2H_5Br	0.97	0.66	0.48	0.39					0.83478	2.99446	335.850	−59.764	0.00021716
1,1-Dichloroethane	$C_2H_4Cl_2$	1.35	0.88	0.62	0.49	0.36				1.37295	1.23179	556.460	−39.335	0.00005608
1,2-Dichloroethane	$C_2H_4Cl_2$		1.56	1.09	0.84	0.58	0.33	0.21	0.14	−0.45273	17.42862	610.982	−1044.345	0.00008499
1,2-Dibromoethane	$C_2H_4Br_2$				1.73	1.14	0.67			1.30990	0.80947	895.720	−17.882	0.00004775
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	0.31	0.22	0.16	0.13	0.09				4.61506	1.76477	546.015	−252.896	0.00000187

D3.1. Table 7. (continued)

Substance	Formula	Temperature (°C)								Equation (2)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
1,1,1-Trichloroethane	$C_2H_3Cl_3$		1.86	1.13	0.82	0.56	0.35			0.61256	2.57080	431.477	−5.988	0.00020394
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$		4.65	2.60	1.77	1.11	0.63	0.43		−1.87216	3.09287	643.532	−79.592	0.00064250
Pentachloroethane	C_2HCl_5		6.15	3.46	2.35	1.45	0.78	0.47		1.19161	3.53080	457.262	−59.526	0.00026156
Hexachloroethane	C_2Cl_6								0.38	0.93763	1.54402	933.967	−95.372	0.00004948
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$					0.89				2.43919	1.98108	589.547	−55.108	0.00002928
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		1.47	0.94	0.70	0.49	0.30			0.82677	1.39278	641.776	−33.411	0.00006607
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	1.07	0.69	0.48	0.37	0.27	0.17			1.87065	0.72922	852.495	−53.946	0.00001040
1-Chloropropane	C_3H_7Cl	0.89	0.61	0.44	0.36	0.27	0.18	0.11		1.92904	0.84928	457.628	5.103	0.00004817
1-Chlorobutane	C_4H_9Cl	1.28	0.82	0.57	0.45	0.33	0.22	0.16		1.52415	0.59496	866.798	−26.351	0.00001925
1-Chloropentane	$C_5H_{11}Cl$	1.86	1.14	0.77	0.59	0.42	0.27			0.62392	1.37795	655.392	−49.534	0.00007030
Chlorotrifluoroethene	C_2ClF_3	2.80								2.44328	0.87633	677.365	−14.748	0.00001698
Vinyl chloride	C_2H_3Cl	0.39	0.29	0.22	0.18	0.14	0.10	0.07		3.40346	0.04475	1554.962	−9.904	0.00000057
1,1-Dichloroethene	$C_2H_2Cl_2$	1.21	0.79	0.54	0.42					1.81449	1.43005	596.573	−79.313	0.00002607
Trichloroethene	C_2HCl_3		0.97	0.70	0.57	0.44				0.09853	0.87464	646.099	−1.547	0.00016897
Tetrachloroethene	C_2Cl_4			1.12	0.89	0.67	0.45	0.33	0.25	1.65634	0.78790	633.414	−20.306	0.00006745
Fluorobenzene	C_6H_5F		1.17	0.76	0.58	0.42	0.27	0.18		2.04963	0.38729	532.926	91.376	0.00004074
Chlorobenzene	C_6H_5Cl			1.06	0.80	0.57	0.37	0.26	0.19	2.62728	−0.00003	685.399	159.643	0.00001868
Bromobenzene	C_6H_5Br		2.47	1.55	1.14	0.78	0.48	0.34		2.12889	0.10412	1705.036	59.324	0.00000753
Iodobenzene	C_6H_5I		4.05	2.38	1.69	1.11	0.65	0.43		2.37813	0.16293	1304.037	67.555	0.00001003
m-Chlorotoluene	C_7H_7Cl		2.08	1.30	0.95	0.65	0.41	0.29		0.66570	2.57537	448.320	−26.587	0.00021128
Benzyl chloride	C_7H_7Cl		2.67	1.67	1.20	0.79	0.44	0.28		1.98218	1.93498	643.943	−99.094	0.00003369
***n*-Alkanes**														
Methane	CH_4									2.31365	0.66803	200.211	−19.178	0.00001039
Ethane	C_2H_6	0.10	0.08	0.06						2.43591	0.09710	309.734	33.467	0.00001554
Propane	C_3H_8	0.22	0.16	0.13	0.10	0.07				2.56344	0.16137	372.533	38.033	0.00001751
n-Butane	C_4H_{10}	0.36	0.26	0.20	0.17	0.13	0.08			2.62924	0.23703	428.069	37.093	0.00001801
n-Pentane	C_5H_{12}	0.51	0.37	0.28	0.23	0.18	0.11			2.80331	0.25074	474.455	32.856	0.00001653
n-Hexane	C_6H_{14}	0.75	0.51	0.38	0.31	0.24				0.69508	0.53665	704.295	16.747	0.00005657
n-Heptane	C_7H_{16}	1.17	0.76	0.53	0.42	0.30	0.19			2.96002	0.24715	553.942	62.172	0.00001424
n-Octane	C_8H_{18}	1.63	1.03	0.71	0.55	0.39	0.24			2.87088	0.35483	577.534	48.983	0.00001722
n-Nonane	C_9H_{20}	2.48	1.45	0.94	0.70	0.48	0.29	0.19		2.91497	0.49850	609.361	38.982	0.00001562
n-Decane	$C_{10}H_{22}$		2.01	1.28	0.94	0.64	0.38	0.24		2.76810	0.64646	621.362	24.170	0.00002107
n-Undecane	$C_{11}H_{24}$		2.95	1.71	1.19	0.76	0.43	0.28		1.42789	1.36923	615.194	−0.597	0.00005825

n-Dodecane	$C_{12}H_{26}$			2.25	1.50	0.92	0.51	0.33	0.23	1.87106	0.59429	757.672	63.871	0.00003070
n-Tridecane	$C_{13}H_{28}$			2.78	1.87	1.14	0.60	0.37	0.26	1.05863	1.73484	695.337	−39.851	0.00006504
n-Tetradecane	$C_{14}H_{30}$				2.29	1.34	0.69	0.42	0.29	1.70345	1.10500	696.658	26.022	0.00004770
n-Pentadecane	$C_{15}H_{32}$				2.75	1.60	0.80	0.47	0.32	1.32056	1.61496	714.996	−23.879	0.00006051
n-Hexadecane	$C_{16}H_{34}$				3.30	1.87	0.91	0.53	0.35	1.75863	0.59899	1140.067	17.721	0.00001758
n-Heptadecane	$C_{17}H_{36}$					2.16	1.03	0.59	0.39	0.25719	1.55014	986.952	−71.139	0.00007134
n-Octadecane	$C_{18}H_{38}$					2.44	1.13	0.64	0.42	1.77701	0.56471	1241.303	18.268	0.00001609
n-Nonadecane	$C_{19}H_{40}$					2.79	1.29	0.72	0.46	0.56468	1.52936	1020.103	−76.599	0.00005702
n-Eicosane	$C_{20}H_{42}$					3.20	1.44	0.79	0.49	0.77549	2.16016	789.785	−65.277	0.00008902
Isoalkanes														
Isobutane	C_4H_{10}	0.38	0.27	0.20	0.16					2.79529	0.37315	419.630	28.072	0.00001567
2-Methyl butane	C_5H_{12}	0.55	0.38	0.28	0.22					1.34155	1.33584	426.654	−16.753	0.00005280
2,2-Dimethyl propane	C_5H_{12}			0.33	0.24	0.18	0.12			0.20382	2.65306	366.672	40.292	0.00012836
2-Methyl pentane	C_6H_{14}	0.75	0.50	0.36	0.29	0.22				1.25443	1.20225	495.370	−20.972	0.00005066
3-Methyl pentane	C_6H_{14}	0.73	0.51	0.38	0.30	0.23				−1.65266	4.71153	545.792	−273.697	0.00021598
2,2-Dimethyl butane	C_6H_{14}	1.10	0.69	0.48	0.37					0.78335	1.79719	521.065	−50.880	0.00006606
2,3-Dimethyl butane	C_6H_{14}	1.04	0.70	0.49	0.38	0.27				2.40720	2.47024	483.731	−163.832	0.00002948
Olefins														
Ethylene	C_2H_4	0.09	0.07							2.09844	0.09095	281.469	47.654	0.00002107
Propylene	C_3H_6	0.18	0.14	0.11	0.10					1.41868	0.31808	772.733	−16.157	0.00001059
1-Butene	C_4H_8	0.30	0.22							1.12328	1.46382	431.592	−78.509	0.00004504
1-Pentene	C_5H_{10}	0.43	0.31	0.24	0.20					1.23863	0.83928	552.930	−31.663	0.00003416
1-Hexene	C_6H_{12}	0.63	0.43	0.32	0.26	0.20				0.78658	1.77502	489.925	−75.082	0.00006364
1-Heptene	C_7H_{14}	0.87	0.59	0.44	0.35	0.27	0.19	0.15	0.12	0.86573	0.25317	1520.715	−26.413	0.00001982
1-Octene	C_8H_{16}	1.36	0.88	0.61	0.48	0.35	0.23			1.29101	1.29302	586.319	−48.960	0.00004920
Propadiene	C_3H_4	0.22	0.19	0.16	0.14					0.89336	0.66484	424.315	−49.755	0.00006299
1,2-Butadiene	C_4H_6	0.28	0.23	0.19						0.67336	0.50405	612.623	−27.742	0.00005206
1,3-Butadiene	C_4H_6			0.19	0.15	0.10	0.06			0.88238	101.98307	384.667	−3372.077	0.00005430
1,2-Pentadiene	C_5H_8	0.39	0.30	0.24	0.20					0.90990	0.49699	702.284	−22.926	0.00003729
trans-1,3-Pentadiene	C_5H_8	0.39	0.30	0.24	0.20					0.67882	1.19675	469.034	−52.560	0.00007247
1,4-Pentadiene	C_5H_8	0.39	0.30	0.24	0.20					0.95705	0.89154	474.141	−25.365	0.00006023
2,3-Pentadiene	C_5H_8	0.39	0.30	0.24	0.20					0.87673	0.76868	537.821	−27.161	0.00005318
Acetylene and derivatives														
Acetylene	C_2H_2	0.15	0.12	0.10						2.52365	1.17810	426.582	−212.035	0.00001364
Propyne	C_3H_4	0.29	0.22	0.17	0.15	0.12	0.09			1.51137	0.90164	554.417	−83.957	0.00002240
2-Butyne	C_4H_6		0.35	0.27	0.22	0.17				1.18604	2.76132	469.413	−204.254	0.00004722
1-Butyne	C_4H_6	0.40	0.31	0.25	0.21	0.17	0.13			1.63188	0.65707	586.283	−56.906	0.00002696

D3.1. Table 7. (continued)

Substance	Formula	Temperature (°C)								Equation (2)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Naphthenes														
Cyclopropane	C_3H_6	0.31	0.24	0.19						1.54429	0.85237	493.205	−65.344	0.00003113
Cyclobutane	C_4H_8	0.54	0.41	0.32	0.27	0.22				1.32593	0.96765	615.982	−101.863	0.00003774
Cyclopentane	C_5H_{10}		0.79	0.56	0.43					0.87341	38.24451	488.485	−1832.850	0.00005995
Methyl cyclopentane	C_6H_{12}		0.93	0.65	0.50	0.36				2.03241	1.34658	511.445	−48.471	0.00004178
Ethyl cyclopentane	C_7H_{14}			0.72	0.57	0.41	0.27			1.26432	1.29189	649.180	−71.893	0.00004633
Propyl cyclopentane	C_8H_{16}	2.32	1.36	0.89	0.68	0.49	0.33			−0.10699	1.30324	655.283	−17.596	0.00015405
Butyl cyclopentane	C_9H_{18}	3.26	1.88	1.20	0.89	0.61	0.37	0.25		1.34628	1.62686	558.215	−34.525	0.00007450
Pentyl cyclopentane	$C_{10}H_{20}$			1.59	1.14	0.76	0.45	0.31	0.24	−1.11498	1.19528	983.833	−53.542	0.00023152
Hexyl cyclopentane	$C_{11}H_{22}$			2.10	1.47	0.94	0.53	0.35	0.26	−1.13172	1.69976	925.702	−92.482	0.00020910
Cyclohexane	C_6H_{12}				0.97	0.61	0.33	0.21	0.14	0.75690	2.02779	787.882	−117.742	0.00003221
Methyl cyclohexane	C_7H_{14}	2.83	1.59	0.99	0.73	0.50	0.33			−0.74619	6.01059	429.985	−152.623	0.00034647
Ethyl cyclohexane	C_8H_{16}	3.18	1.78	1.13	0.84	0.58	0.36			1.52910	0.51211	842.298	28.257	0.00003076
Propyl cyclohexane	C_9H_{18}	4.60	2.35	1.40	1.00	0.67	0.42	0.30		−0.55711	1.64220	646.674	−10.660	0.00024150
Butyl cyclohexane	$C_{10}H_{20}$			1.88	1.30	0.84	0.50	0.37		−0.87038	1.86712	617.939	2.177	0.00036852
Pentyl cyclohexane	$C_{11}H_{22}$	6.63	3.52	2.09	1.47	0.94	0.53	0.35	0.26	−2.02019	1.03757	1391.703	−90.787	0.00038189
Hexyl cyclohexane	$C_{12}H_{24}$			3.55	2.18	1.26	0.69	0.47	0.36	0.39759	0.73957	722.436	94.236	0.00016567
Cyclopentene	C_5H_8	0.88	0.60	0.44	0.35	0.26	0.18			3.03864	0.13240	1265.791	−1.551	0.00000199
Cyclohexene	C_6H_{10}	2.22	1.33	0.87	0.66	0.46	0.29			1.32523	1.09890	682.520	−31.539	0.00003971
Aromatic compounds														
Benzene	C_6H_6				0.64	0.44	0.26	0.17	0.11	2.35743	2.43122	760.674	−267.449	0.00001031
Toluene	C_7H_8	2.12	1.20	0.78	0.59	0.42	0.26			2.95480	0.00003	1048.107	137.144	0.00000397
Ethyl benzene	C_8H_{10}	2.24	1.35	0.90	0.68	0.48	0.30			1.62469	0.79236	745.185	−16.276	0.00002899
Propyl benzene	C_9H_{12}	3.40	1.89	1.18	0.86	0.58	0.36	0.25		0.57949	1.41702	663.889	−28.020	0.00008430
Butyl benzene	$C_{10}H_{14}$	4.71	2.44	1.46	1.04	0.69	0.41	0.28		1.15033	1.50259	547.276	7.044	0.00009568
Pentyl benzene	$C_{11}H_{16}$			2.03	1.35	0.86	0.50	0.31	0.18	2.25142	0.05803	500.962	195.336	0.00006352
Hexyl benzene	$C_{12}H_{18}$			2.69	1.69	1.01	0.58	0.35	0.28	0.63147	1.93122	423.312	91.152	0.00033398
o-Xylene	C_8H_{10}		1.73	1.10	0.81	0.56	0.34			1.88479	0.23639	1377.129	22.892	0.00000903
m-Xylene	C_8H_{10}		1.19	0.80	0.62	0.44	0.29			0.83592	1.33199	637.761	−46.156	0.00006847
p-Xylene	C_8H_{10}				0.65	0.46	0.29			0.80720	1.37688	638.213	−40.858	0.00006787
1,2,3-Trimethyl benzene	C_9H_{12}		2.47	1.43	0.98	0.61	0.33	0.20		1.30935	2.05880	633.423	−61.927	0.00003863
1,2,4-Trimethyl benzene	C_9H_{12}		2.22	1.35	0.96	0.62	0.35	0.22		1.53346	1.54307	674.260	−51.363	0.00003357

1,3,5-Trimethyl benzene	C_9H_{12}		1.91	1.14	0.81	0.53	0.31	0.21		0.66691	1.78474	611.651	−30.201	0.00007216
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$			2.71	1.73	0.97	0.46	0.26	0.16	1.36952	2.99462	598.830	−76.944	0.00004700
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$			2.06	1.35	0.79	0.39	0.23		1.37525	2.47071	620.301	−64.925	0.00003980
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$						0.40	0.25		0.99413	2.50337	681.125	−109.874	0.00004350
Pentamethyl benzene	$C_{11}H_{16}$						0.58	0.28	0.16	1.45987	4.29539	616.285	−107.695	0.00003215
Hexamethyl benzene	$C_{12}H_{18}$								0.17	1.22472	10.29732	584.012	−288.554	0.00004085
Styrene	C_8H_8		1.61	1.02	0.76	0.52	0.32			2.52817	0.19295	1189.840	44.635	0.00000538
Isopropyl benzene	C_9H_{12}	3.11	1.72	1.08	0.80	0.55	0.34			1.59020	0.52734	825.677	29.696	0.00002771
Biphenyl	$C_{12}H_{10}$		9.77	5.16	3.36	1.95	0.96	0.56	0.37	1.44526	0.96526	1040.250	−32.003	0.00002670
Diphenyl methane	$C_{13}H_{12}$		8.74	4.64	3.04	1.79	0.91	0.55	0.37	0.73771	1.12625	964.267	−30.528	0.00006040
Triphenyl methane	$C_{19}H_{16}$		71.70	31.26	17.65	8.47	3.20	1.51	0.84	1.19279	2.16005	961.714	−90.134	0.00004502
Tetraphenyl methane	$C_{25}H_{20}$									1.13557	4.22608	895.853	−201.703	0.00010734
Naphthalene	$C_{10}H_8$						0.77	0.53	0.38	2.91719	−0.00009	725.690	152.240	0.00002552
1-Methylnaphthalene	$C_{11}H_{10}$		16.26	6.06	3.34	1.73	0.88	0.63	0.56	−4.70967	2.73910	679.956	24.202	0.00797964
2-Methylnaphthalene	$C_{11}H_{10}$					1.40	0.72	0.48	0.37	−0.95968	1.92015	645.748	28.287	0.00043145
1-Ethylnaphthalene	$C_{12}H_{12}$			8.07	4.11	1.97	0.94	0.64	0.55	−3.11745	2.51548	622.592	56.635	0.00267011
2-Ethylnaphthalene	$C_{12}H_{12}$			5.06	2.92	1.57	0.79	0.53	0.42	−2.15924	2.20844	659.680	28.821	0.00106785
Alcohols														
Methanol	CH_4O	2.22	1.26	0.80	0.58	0.39				3.79226	0.17755	546.563	87.845	0.00000791
Ethanol	C_2H_6O	6.27	3.13	1.76	1.17	0.69	0.32	0.17		6.16832	−0.00125	740.323	90.778	0.00000038
1-Propanol	C_3H_8O	21.41	8.01	3.70	2.20	1.12				4.91749	0.83615	482.980	73.079	0.00001026
1-Butanol	$C_4H_{10}O$	35.76	12.17	5.16	2.91	1.42	0.55			4.35655	1.01095	742.263	26.911	0.00000214
1-Pentanol	$C_5H_{12}O$			7.63	4.03	1.81	0.65			1.29984	2.31754	793.256	−36.745	0.00001600
1-Hexanol	$C_6H_{14}O$			10.78	5.30	2.25	0.78	0.36		2.38169	2.01882	628.673	36.282	0.00002196
1-Heptanol	$C_7H_{16}O$		55.91	15.68	6.98	2.68	0.88	0.44		−0.90610	4.79159	549.369	−1.348	0.00030998
1-Octanol	$C_8H_{18}O$				8.70	3.25	0.97	0.43		−3.01414	4.51847	742.731	−58.271	0.00043189
Isopropanol	C_3H_8O	35.98	11.48	4.46	2.33	1.02				3.07172	3.84587	580.414	−62.691	0.00000742
2-Methyl-1-propanol	$C_4H_{10}O$	103.71	25.05	8.23	3.97	1.63	0.54	0.24	0.13	1.75100	4.27573	508.236	−6.909	0.00005339
3-Methyl-1-butanol	$C_5H_{12}O$			8.57	4.28	1.82	0.62			2.37997	2.49622	630.920	5.329	0.00001584
Ethylene glycol	$C_2H_6O_2$			55.27	21.23	6.98	1.99	0.93	0.61	−2.46697	5.00103	587.004	10.679	0.00132759
1,3-Propylene glycol	$C_3H_8O_2$					15.57	3.72	1.37		4.54401	0.75893	711.876	132.080	0.00000695
Glycerol	$C_3H_8O_3$				1433	151.4	14.49	3.93	2.02	−3.91153	6.54946	582.480	73.885	0.00799640
Cyclohexanol	$C_6H_{12}O$					12.72	1.99	0.70		0.02813	3.61442	534.094	121.724	0.00026465
Benzyl alcohol	C_7H_8O			13.88	5.93	2.50	1.05	0.63	0.44	0.44585	0.08077	2571.495	151.699	0.00007198
Phenols														
o-Cresol	C_7H_8O					2.95	1.00	0.50		−1.89618	3.60949	631.884	15.554	0.00052426

D3.1. Table 7. (continued)

Substance	Formula	Temperature (°C)								Equation (2)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
m-Cresol	C_7H_8O					4.20	1.19	0.58	0.32	1.25683	1.54210	482.684	175.193	0.00021035
p-Cresol	C_7H_8O					4.60	1.29	0.61	0.36	1.06826	2.00817	491.556	150.679	0.00022764
Phenol	C_6H_6O					3.46	1.10	0.58	0.43	−0.58868	3.54041	505.278	86.084	0.00049135
Carboxylic acids														
Formic acid	CH_2O_2				1.78	1.04	0.53			1.06486	0.68065	1102.891	11.307	0.00002427
Acetic acid	$C_2H_4O_2$				1.22	0.79	0.45			1.74793	1.33728	482.347	41.780	0.00009963
Propionic acid	$C_3H_6O_2$			1.53	1.10	0.74	0.45			1.40324	1.23452	507.512	36.027	0.00011180
Butyric acid	$C_4H_8O_2$			2.31	1.61	1.01	0.55	0.35		−0.59438	3.25801	702.490	−155.864	0.00016068
Valeric acid	$C_5H_{10}O_2$		6.19	3.37	2.23	1.31	0.64	0.36		4.18858	0.59968	696.703	32.858	0.00000596
Caproic acid	$C_6H_{12}O_2$			5.23	3.17	1.75	0.87	0.55	0.41	−0.09052	2.89549	536.223	1.885	0.00035472
Acetic anhydride	$C_4H_6O_3$	3.41	1.93	1.22	0.90	0.61	0.38			0.83036	2.94744	443.462	−55.683	0.00018360
Propionic anhydride	$C_6H_{10}O_3$			1.59	1.13	0.74	0.43	0.28		0.91350	1.53689	664.075	−33.692	0.00007064
Chloroacetic acid	$C_2H_3ClO_2$					3.30	1.29			1.55021	0.00012	475.704	291.063	0.00024327
Dichloroacetic acid	$C_2H_2Cl_2O_2$				7.29	3.17	0.68			11.44422	0.73703	438.241	−120.582	0.00000190
Trichloroacetic acid	$C_2HCl_3O_2$						1.10	0.19		0.89511	−51.82878	337.101	−405.316	0.00359585
Ketones														
Ketene	C_2H_2O	0.52								1.31545	1.31192	334.574	−25.576	0.00012225
Acetone	C_3H_6O	0.80	0.54	0.40	0.32	0.24				1.65496	0.57330	610.687	11.477	0.00002915
Methyl ethyl ketone	C_4H_8O	1.08	0.73	0.53	0.42	0.31	0.20	0.14	0.10	3.36887	0.15106	994.604	10.710	0.00000262
Diethyl ketone	$C_5H_{10}O$		0.83	0.59	0.47	0.34	0.23			1.78235	1.27121	589.709	−76.509	0.00003465
Dipropyl ketone	$C_7H_{14}O$		1.74	1.06	0.76	0.51	0.30			0.53899	1.60566	636.434	−28.275	0.00007612
Acetophenone	C_8H_8O				1.81	1.10				1.33990	0.72070	519.145	125.271	0.00014141
Benzophenone	$C_{13}H_{10}O$						1.74	0.75		−1.02889	2.62407	887.912	−31.349	0.00014250
Ethers														
Dimethyl ether	C_2H_6O	0.18	0.15							−24.14991	826.18026	333.839	−9717.889	0.00504502
Diethyl ether	$C_4H_{10}O$	0.53	0.39	0.29	0.24	0.18	0.11			2.19245	3.83507	520.594	−370.873	0.00002040
Dipropyl ether	$C_6H_{14}O$	1.24	0.79	0.54	0.42	0.30				1.70133	1.11633	592.026	−34.625	0.00003012
Methyl propyl ether	$C_4H_{10}O$	0.59	0.41	0.31	0.25					1.23830	1.16190	484.926	−27.978	0.00004941
Ethyl propyl ether	$C_5H_{12}O$	0.78	0.54	0.40	0.32	0.24				1.88361	1.70057	486.071	−102.106	0.00003744
Ethylene oxide	C_2H_4O	0.57	0.41	0.32						2.03182	0.24658	923.371	−4.439	0.00000986
Furane	C_4H_4O	0.99	0.66	0.48	0.38					0.99383	1.26306	558.327	−41.885	0.00006015
1,4-Dioxane	$C_4H_8O_2$				1.30	0.81	0.46			−0.88995	5.54776	466.802	−109.574	0.00041685

Aldehydes														
Formaldehyde	CH_2O	0.33	0.24							0.69796	1.14046	549.921	−44.110	0.00003565
Acetaldehyde	C_2H_4O	0.58	0.39	0.28	0.22					1.93622	1.28342	451.995	−34.901	0.00003002
Paraldehyde	$C_6H_{12}O_3$				1.19	0.68	0.37			2.30632	0.16500	580.288	180.024	0.00002892
Furfural	$C_5H_4O_2$		5.01	2.55	1.72	1.13	0.75	0.65		−1.74070	2.22317	510.261	48.654	0.00137465
Benzaldehyde	C_7H_6O	6.53	3.47	2.09	1.49	0.97	0.57	0.38		0.68640	1.42033	705.459	−31.539	0.00010016
Salicylaldehyde	$C_7H_6O_2$				2.69	1.57	0.80	0.49		−1.05492	3.11770	694.096	−97.628	0.00030993
Esters														
Methyl formate	$C_2H_4O_2$			0.44	0.35					−0.91668	1.04562	600.645	30.794	0.00025227
Ethyl formate	$C_3H_6O_2$	1.09	0.71	0.50	0.40	0.30				0.70107	1.29587	586.673	−38.736	0.00006727
Propyl formate	$C_4H_8O_2$	1.62	1.00	0.68	0.52	0.37				3.44810	0.00004	653.964	118.712	0.00000644
Methyl acetate	$C_3H_6O_2$			0.47	0.38	0.28	0.18	0.12		2.35777	1.57824	508.322	−127.221	0.00002998
Ethyl acetate	$C_4H_8O_2$	1.08	0.78	0.57	0.45	0.33	0.20	0.13	0.09	2.87505	3.82999	701.624	−475.816	0.00000853
Propyl acetate	$C_5H_{10}O_2$			0.75	0.59	0.42	0.25	0.16	0.10	2.51468	7.47712	600.279	−667.720	0.00002056
Methyl propionate	$C_4H_8O_2$			0.58	0.46	0.34				1.95117	0.93694	615.575	−40.012	0.00002716
Ethyl propionate	$C_5H_{10}O_2$			0.69	0.53	0.38				1.13267	1.39120	636.287	−63.713	0.00004664
Propyl propionate	$C_6H_{12}O_2$	2.60	1.47	0.93	0.69	0.47	0.29			0.97927	1.56323	602.941	−33.934	0.00006131
Methyl butyrate	$C_5H_{10}O_2$	1.88	1.14	0.76	0.58	0.41	0.26			1.19242	1.14545	659.315	−32.416	0.00004368
Ethyl butyrate	$C_6H_{12}O_2$			0.89	0.67	0.47	0.30			0.69721	1.44466	631.106	−37.809	0.00007509
Methyl benzoate	C_8H_8O2				2.03	1.14	0.55	0.32		1.09205	2.23998	629.397	−30.878	0.00006372
Ethyl benzoate	$C_9H_{10}O_2$			3.46	2.19	1.27	0.67	0.44	0.33	−0.52423	2.21075	621.267	−1.514	0.00029435
Methyl salicylate	$C_8H_8O_3$			4.50	2.83	1.61	0.81	0.50	0.35	0.78116	2.21500	566.049	2.932	0.00017111
Amines														
Methyl amine	CH_5N	0.46	0.31	0.23						0.67474	1.15788	540.516	−19.923	0.00004244
Ethyl amine	C_2H_7N	0.82	0.48	0.30						4.57723	3.23212	461.592	−187.220	0.00000375
Propyl amine	C_3H_9N	1.27	0.78	0.53	0.40					1.43759	1.38853	576.592	−41.604	0.00003388
n-Butyl amine	$C_6H_{15}N$			0.83	0.62	0.41				4.93315	5.56240	539.687	−504.926	0.00000690
Dimethyl amine	C_2H_7N	0.41	0.31	0.23	0.19	0.14				2.36300	0.00009	401.423	108.715	0.00002662
Trimethyl amine	C_3H_9N	0.39	0.29	0.23	0.19	0.14				2.49364	3.31500	473.868	−357.809	0.00001998
Diethyl amine	$C_6H_{15}N$		0.70	0.46	0.35	0.24				2.23041	0.67794	410.269	75.910	0.00004206
Triethyl amine	$C_6H_{15}N$			0.46	0.37	0.27				1.14057	1.76812	540.640	−101.165	0.00005323
Piperidine	$C_5H_{11}N$				1.50	0.93	0.47			2.87595	2.15313	604.743	−97.645	0.00002125
Pyridine	C_6H_7N		2.45	1.37	0.96	0.63	0.40			−1.07330	2.28184	531.855	9.899	0.00042903
Aniline	C_6H_7N			10.34	4.54	1.95	0.83	0.49		0.85750	1.71069	462.011	136.981	0.00028187
N-methyl aniline	C_7H_9N			3.95	2.26	1.19	0.57	0.37		−1.58729	2.74662	611.361	10.495	0.00047319
N,*N*-dimethyl aniline	$C_8H_{11}N$				1.40	0.90	0.52	0.35		2.17192	0.33015	782.598	90.952	0.00002587

D3.1. Table 7. (continued)

Substance	Formula	Temperature (°C)								Equation (2)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
N,*N*-diethyl aniline	$C_{10}H_{15}N$			3.55	2.18	1.22	0.61	0.39	0.29	−2.17946	2.59836	712.387	−32.879	0.00061721
Phenylhydrazine	$C_6H_8N_2$				16.49	4.57	0.85			4.03637	4.11517	716.323	−44.624	0.00000082
Diphenyl amine	$C_{12}H_{11}N$						1.69	0.80	0.50	−1.88236	2.76806	703.956	42.025	0.00069814
Nitriles														
Acetonitrile	C_2H_3N				0.37	0.28				−0.08444	3.22207	685.539	−331.224	0.00006935
Propionitrile	C_3H_5N			0.54	0.43	0.32				0.15621	2.63370	600.424	−178.151	0.00008475
Butyronitrile	C_4H_7N	1.75	1.09	0.75	0.57	0.41	0.27			1.43860	0.97107	678.200	−30.941	0.00003687
Benzonitrile	C_7H_5N			1.92	1.33	0.87	0.52	0.36		1.74964	0.45048	621.897	104.361	0.00006329
Amides														
Formamide	CH_3NO				3.85	1.89	0.84	0.50	0.36	−0.82268	2.80139	592.004	19.366	0.00038574
Nitroderivates														
Nitromethane	CH_3NO_2		1.27	0.86	0.67	0.48	0.30			2.74060	0.08984	536.681	119.119	0.00002704
Nitrobenzene	$C_6H_5NO_2$				2.05	1.26	0.71	0.48	0.35	1.75794	0.36655	679.009	124.816	0.00006683
o-Nitrotoluene	$C_7H_7NO_2$			3.82	2.37	1.38	0.76	0.54	0.46	−1.52541	2.37156	581.717	24.432	0.00083353
m-Nitrotoluene	$C_7H_7NO_2$				2.33	1.36	0.76	0.54	0.45	−1.89318	2.22744	626.017	17.125	0.00099984
p-Nitrotoluene	$C_7H_7NO_2$						0.75	0.54	0.45	0.00118	1.22450	513.379	128.908	0.00041885

D3.1. Table 8. Dynamic viscosity of gases in μPa s at low pressures

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
Elements														
Xenon	Xe	17.4	21.3	23.2	28.6	35.3	41.5	47.3	52.7	−0.23692	0.98454	−0.48314	0.01953	−0.00342
Krypton	Kr	19.6	23.5	25.4	30.8	37.5	43.5	49.1	54.2	−0.07920	1.02624	−0.55428	0.02187	−0.00369
Argon	Ar		21.1	22.6	27.0	32.5	37.5	42.2	46.5	0.16196	0.81279	−0.41263	0.01668	−0.00276
Neon	Ne	25.4	29.6	31.5	37.1	43.7	49.6	54.9	59.9	0.23014	1.22527	−0.97141	0.05386	−0.01103
Helium	He	16.2	18.6	19.8	23.2	27.4	31.3	35.1	38.6	0.39223	0.61300	−0.31007	0.01479	−0.00284
Air		14.6	17.2	18.5	21.9	26.1	29.8	33.2	36.5	−0.01702	0.79965	−0.72183	0.04960	−0.01388
Hydrogen	H_2	7.3	8.3	8.9	10.4	12.2	14.0	15.6	17.1	0.18024	0.27174	−0.13395	0.00585	−0.00104
Nitrogen	N_2	14.0	16.5	17.8	21.1	25.2	28.7	32.0	35.0	−0.01020	0.74785	−0.59037	0.03230	−0.00673
Oxygen	O_2	16.2	19.2	20.7	24.7	29.5	33.8	37.7	41.4	−0.10257	0.92625	−0.80657	0.05113	−0.01295
Sulfur	S					6.9	8.3	9.7	11.1	0.09670	0.11835	0.01588		
Fluorine	F_2	18.1	21.5	23.2	27.8	33.6	38.9	43.9	48.7	−0.11373	1.03844	−0.96327	0.08073	−0.02846
Chlorine	Cl_2	10.0	12.3	13.4	16.6	20.8	24.8	28.6	32.2	−0.06348	0.49801	−0.09451		
Bromine	Br_2		14.3	15.4	19.0	23.8	28.7			0.19483	0.43743	0.05031		
Iodine	I_2					21.8	26.0	30.2	34.3	0.06758	0.46358	−0.03714		
Anorganic compounds														
Hydrogen fluoride	HF			11.3	16.0					−7.08883	4.18933	−1.19859	−1.98523	2.59754
Hydrogen chloride	HCl	10.8	13.4	14.6	18.3	22.9	27.3	31.5	35.4	−0.12146	0.56696	−0.12126		
Hydrogen bromide	HBr	13.8	16.6	18.1	22.2	27.7	33.1	38.5	43.7	0.09163	0.58825	−0.04531		
Hydrogen iodide	HI		17.4	19.0	23.5	29.4	35.1			−0.01823	0.67176	−0.09695		
Hydrogen cyanide	HCN				3.6					−0.06954	0.08177	0.09107		
Water	H_2O		9.1	9.9	12.4	16.2	20.3	24.5	28.6	0.64966	−0.15102	1.15935	0.10080	0.03100
Hydrogen sulfide	H_2S		11.7	12.6	15.7	20.6				0.54442	0.10851	0.44565		
Ammonia	NH_3	7.4	9.2	10.1	12.9	16.5	20.1	23.7	27.4	−0.07883	0.36749	−0.00451		
Nitric oxide	NO	14.9	17.8	19.1	22.9	27.3	31.2	34.8	38.0	−0.09105	0.84998	−0.71473	0.04240	−0.01020
Nitrogen dioxide	NO_2				18.7	24.6	29.4	33.6	37.4	−2.28505	1.75834	−2.29768	0.17134	−0.04920
Nitrous oxide	N_2O	11.0	13.4	14.6	18.1	22.4	26.4	30.0	33.4	−0.09569	0.57181	−0.16548		
Dinitrogentetroxide	N_2O_4	13.5	16.6	18.1	22.5	28.2	33.6	38.7	43.6	−0.08683	0.67450	−0.12834		
Cyanogen	C_2N_2		9.3	10.1	12.7	16.0	19.3			−0.00521	0.34573	−0.01265		
Phosphorus trichloride	PCl_3	7.8	9.6	10.5	13.2	16.6	19.8	22.9	26.0	−0.11382	0.42969	−0.14926	0.00744	−0.00177
Cyanogen chloride	ClCN	6.2	7.6	8.4	10.4	13.1	15.6	18.0	20.2	−0.07162	0.32567	−0.07104		
Silane	SiH_4	8.9	10.7	11.6	14.2	17.8	21.3	24.8	28.4	0.10189	0.35395			
Tetrachlorosilane	$SiCl_4$	7.5	9.3	10.2	12.8	16.1	19.2	22.2	25.1	−0.13422	0.42941	−0.15995	0.00734	−0.00161
Carbon monoxide	CO	14.0	16.5	17.7	20.9	24.9	28.4	31.5	34.5	0.01384	0.74306	−0.62996	0.03948	−0.01032
Carbon dioxide	CO_2	11.2	13.8	15.0	18.4	22.6	26.5	30.0	33.3	−0.18024	0.65989	−0.37108	0.01586	−0.00300
Carbon suboxide	C_3O_2	9.1	11.2	12.2	15.2	19.0	22.6	26.1	29.4	−0.05865	0.45539	−0.08739		
Carbonyl sulfide	COS	9.5	11.7	12.8	16.0	20.2	24.1	27.8	31.4	−0.10565	0.49410	−0.09608		
Phosgene	CCl_2O			9.3	11.6	14.6	17.3	20.0	22.5	−0.06483	0.35637	−0.07409		
Carbon disulfide	CS_2	7.3	9.0	9.9	12.5	16.0	19.4	22.7	26.0	−0.07840	0.36608	−0.02490		
Sulfur dioxide	SO_2	9.5	11.8	12.9	16.1	20.3	24.2	27.9	31.3	−0.13559	0.51230	−0.11626		
Sulfur trioxide	SO_3			13.6	16.8	20.9	24.7	28.1		−0.12683	0.54605	−0.16261		
Sulfuryl chloride	Cl_2SO_2	8.1	10.1	11.1	14.1	17.9	21.6	25.2	28.6	−0.12421	0.43363	−0.06167		
Sulfur hexafluoride	SF_6	10.8	13.6	15.0	18.7	23.2	27.3	30.9	34.3	−0.41132	0.77468	−0.51939	0.02409	−0.00438
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	7.0	8.6	9.5	11.9	15.0	18.0	20.9	23.6	−0.08906	0.36632	−0.06330		
Ethyl mercaptan	C_2H_6S	6.5	8.0	8.7	10.9	13.8	16.5	19.2	21.8	−0.05276	0.32400	−0.04604		
Dimethyl sulfide	C_2H_6S	6.1	7.7	8.5	10.9	13.9	16.8	19.5	22.1	−0.14799	0.35516	−0.06417		
Diethyl sulfide	$C_4H_{10}S$	5.5	6.8	7.4	9.3	11.8	14.2	16.6	18.8	−0.05015	0.27483	−0.03176		
Thiophene	C_4H_4S		7.3	8.1	10.6	13.8	16.9	20.0	22.9	−0.21336	0.35715	−0.04267		
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	9.7	11.8	12.9	15.9	19.6	23.1	26.3	29.2	−0.06024	0.49305	−0.13889		
Difluoromethane (R32)	CH_2F_2	10.5	12.9	14.0	17.4	21.6	25.5	29.2	32.5	−0.09600	0.54630	−0.14683		

D3.1. Table 8. (continued)

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
Trifluoromethane (R23)	CHF_3	10.8	13.1	14.3	17.7	21.9	25.9	29.5	32.8	−0.07808	0.55122	−0.15092		
Tetrafluoromethane (R14)	CF_4	13.3	15.9	17.2	20.8	25.3	29.5	33.2	36.5	0.04703	0.61890	−0.19722		
Methyl chloride	CH_3Cl		10.0	10.9	13.6	17.1	20.4	23.7		−0.02001	0.38917	−0.05170		
Methylene chloride	CH_2Cl_2	7.7	9.5	10.5	13.2	16.6	19.9	22.9	25.8	−0.13776	0.42638	−0.09660		
Chloroform	$CHCl_3$	7.6	9.4	10.2	12.8	16.1	19.2	22.3	25.2	−0.06453	0.38402	−0.06457		
Carbon tetrachloride	CCl_4		9.2	10.0	12.4	15.4	18.2	20.8	23.2	−0.07132	0.39021	−0.10535		
Bromomethane	CH_3Br	10.1	12.4	13.5	16.9	21.1	25.2	29.0	32.6	−0.08606	0.51383	−0.10426		
Dibromomethane	CH_2Br_2				15.5	19.6	23.6	27.4	31.1	−0.10912	0.47247	−0.07256		
Tribromomethane	$CHBr_3$		7.3	8.1	10.5	13.6				−0.17201	0.34298	−0.04096		
Tetrabromomethane	CBr_4	14.0	16.7	18.1	22.5	28.5	34.6	40.6	46.4	0.43125	0.31175	0.68684	−0.06508	0.01952
Chlorodifluoromethane (R22)	$CHClF_2$		11.8	12.9	15.9	19.9	23.7	27.2	30.6	−0.04130	0.47290	−0.09230		
Dichlorofluoromethane (R21)	$CHCl_2F$			11.5	14.3	17.8	21.3	24.6	27.8	0.01328	0.39826	−0.05196		
Chlorotrifluoromethane (R13)	$CClF_3$	10.9	13.3	14.4	17.8	21.9	25.8	29.3	32.5	−0.05012	0.54778	−0.15645		
Dichlorodifluoromethane (R12)	CCl_2F_2		11.6	12.5	15.3	18.9	22.5			0.13920	0.37652	−0.01344		
Trichlorofluoromethane (R11)	CCl_3F	8.6	10.6	11.6	14.5	18.3	22.0	25.6	29.2	−0.03449	0.40992	−0.03558		
Ethyl fluoride (R161)	C_2H_5F	7.7	9.5	10.4	13.0	16.2	19.1	21.9	24.5	−0.09973	0.41549	−0.11166		
Ethyl chloride	C_2H_5Cl	7.2	8.9	9.7	12.1	15.1	17.9	20.6	23.0	−0.07591	0.37662	−0.08906		
Ethyl bromide	C_2H_5Br	8.0	10.0	11.0	13.9	17.5	21.0	24.3	27.4	−0.14674	0.44584	−0.09301		
1,1-Dichloroethane	$C_2H_4Cl_2$	7.1	8.7	9.6	11.9	15.0	17.9	20.7	23.3	−0.06882	0.36469	−0.07069		
1,2-Dichloroethane	$C_2H_4Cl_2$		8.3	9.1	11.4	14.3	17.2	19.9	22.5	−0.10944	0.37538	−0.13037	0.00629	−0.00146
1,2-Dibromoethane	$C_2H_4Br_2$			11.0	14.0	17.8	21.6	25.4	29.0	−0.12583	0.42355	−0.04178		
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	9.2	11.3	12.3	15.3	19.0	22.5	25.6	28.5	−0.09470	0.48575	−0.13494		
1,1,1-Trichloroethane	$C_2H_3Cl_3$		8.1	9.0	11.4	14.5	17.5	20.3	23.0	−0.15006	0.37287	−0.07221		
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$		7.9	8.6	10.8	13.7	16.4	19.1	21.7	−0.06039	0.32246	−0.04471		
Pentachloroethane	C_2HCl_5		7.6	8.4	10.5	13.3	16.0	18.6	21.1	−0.05940	0.31301	−0.04155		
Hexachloroethane	C_2Cl_6					12.9	15.5	18.1	20.6	−0.08639	0.31029	−0.04215		
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$				11.7	14.7	17.7	20.5	23.2	−0.08776	0.36025	−0.06342		
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		9.6	10.6	13.4	17.0	20.4	23.6	26.6	−0.14690	0.43026	−0.08626		
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$		10.6	11.5	14.1	17.4	20.7	23.9	27.1	0.09820	0.36272	−0.03272		
1-Chloropropane	C_3H_7Cl	6.0	7.5	8.3	10.4	13.1	15.7	18.2	20.5	−0.10368	0.33313	−0.07059		
1-Chlorobutane	C_4H_9Cl	5.4	6.8	7.5	9.4	11.9	14.3	16.6	18.7	−0.09753	0.30131	−0.06077		
1-Chloropentane	$C_5H_{11}Cl$					11.0	13.2	15.3	17.3	−0.07931	0.27190	−0.04930		
Chlorotrifluoroethene	C_2ClF_3		11.1	12.1	14.9	18.6	22.0	25.2	28.2	−0.06719	0.46061	−0.11357		
Vinyl chloride	C_2H_3Cl	7.8	9.5	10.3	12.8	15.9	18.9	21.8	24.5	−0.03375	0.37915	−0.07484		
1,1-Dichloroethene	$C_2H_2Cl_2$	7.3	9.1	10.0	12.6	15.8	18.9	21.8	24.5	−0.12601	0.40415	−0.09104		
Trichloroethene	C_2HCl_3	6.9	8.5	9.3	11.6	14.6	17.6	20.3	23.0	−0.07353	0.35321	−0.05952		
Tetrachloroethene	C_2Cl_4		7.9	8.8	11.1	14.2	17.1	19.9	22.5	−0.15830	0.36902	−0.07459		
Fluorobenzene	C_6H_5F				9.9	12.5	15.0	17.3	19.6	−0.05724	0.29935	−0.04944		
Chlorobenzene	C_6H_5Cl		6.8	7.4	9.3	11.8	14.2	16.5	18.7	−0.05654	0.28115	−0.04142		
Bromobenzene	C_6H_5Br					13.1	15.8	18.4	20.9	−0.09017	0.31781	−0.04670		
Iodobenzene	C_6H_5I		7.7	8.5	11.1	14.4	17.6	20.7	23.7	−0.19399	0.36436	−0.04213		
m-Chlorotoluene	C_7H_7Cl		6.4	7.1	9.2	11.8	14.4	17.0	19.4	−0.14194	0.29743	−0.03641		
Benzyl chloride	C_7H_7Cl					10.8	13.1	15.3	17.4	−0.09774	0.26922	−0.04092		
***n*-Alkanes**														
Methane	CH_4	8.7	10.4	11.2	13.5	16.3	18.8	21.2	23.4	−0.07759	0.50484	−0.43101	0.03118	−0.00981
Ethane	C_2H_6	7.0	8.5	9.3	11.5	14.2	16.7	19.1	21.2	−0.04537	0.35537	−0.09658		
Propane	C_3H_8	6.2	7.5	8.2	10.2	12.8	15.2	17.5	19.6	0.07353	0.20874	0.24208	−0.03914	0.01784
n-Butane	C_4H_{10}	5.8	7.0	7.6	9.3	11.6	13.9	16.1	18.3	0.02688	0.25130	−0.02326		
n-Pentane	C_5H_{12}	5.2	6.4	6.9	8.6	10.8	12.9	14.9	16.9	−0.01656	0.24855	−0.03565		
n-Hexane	C_6H_{14}	4.7	5.9	6.4	8.1	10.3	12.3	14.3	16.1	−0.07450	0.25522	−0.04815		
n-Heptane	C_7H_{16}	4.3	5.3	5.8	7.3	9.3	11.2	13.1	14.9	−0.05425	0.22117	−0.02853		
n-Octane	C_8H_{18}	3.8	4.8	5.2	6.7	8.5	10.4	12.2	14.1	−0.05272	0.19657	−0.01009		

D3.1. Table 8. (continued)

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
n-Nonane	C_9H_{20}	3.4	4.4	4.9	6.3	8.2	10.1	12.0	13.7	−0.11361	0.20732	−0.01914		
n-Decane	$C_{10}H_{22}$		4.3	4.7	6.1	7.9	9.7	11.5	13.3	−0.07177	0.18465	−0.00450		
n-Undecane	$C_{11}H_{24}$		4.0	4.4	5.7	7.5	9.3	11.0	12.7	−0.09673	0.18199	−0.00624		
n-Dodecane	$C_{12}H_{26}$		3.7	4.1	5.4	7.1	8.9	10.5	12.2	−0.11853	0.18014	−0.00876		
n-Tridecane	$C_{13}H_{28}$		3.4	3.8	5.1	6.7	8.3	9.9	11.5	−0.10665	0.16513	−0.00257		
n-Tetradecane	$C_{14}H_{30}$			3.7	4.8	6.4	8.0	9.6	11.1	−0.10594	0.15831	−0.00071		
n-Pentadecane	$C_{15}H_{32}$			3.5	4.7	6.2	7.8	9.3	10.9	−0.11473	0.15678	−0.00150		
n-Hexadecane	$C_{16}H_{34}$			3.4	4.5	6.1	7.6	9.2	10.7	−0.13795	0.16148	−0.00748		
n-Heptadecane	$C_{17}H_{36}$			3.3	4.4	5.9	7.5	9.0	10.5	−0.12993	0.15482	−0.00366		
n-Octadecane	$C_{18}H_{38}$				4.3	5.8	7.3	8.7	10.2	−0.12837	0.15164	−0.00385		
n-Nonadecane	$C_{19}H_{40}$				4.2	5.7	7.1	8.5	10.0	−0.12631	0.14796	−0.00355		
n-Eicosane	$C_{20}H_{42}$				4.1	5.5	6.9	8.3	9.7	−0.12507	0.14488	−0.00364		
Isoalkanes														
Isobutane	C_4H_{10}	5.6	6.9	7.5	9.3	11.7	13.9	16.0	18.0	−0.03056	0.27695	−0.05120		
2-Methyl butane	C_5H_{12}	5.4	6.6	7.2	8.9	11.0	13.0	14.8	16.5	−0.04174	0.27672	−0.07472		
2,2-Dimethyl propane	C_5H_{12}		6.5	7.1	9.0	11.3	13.5	15.6	17.6	−0.08799	0.28748	−0.06331		
2-Methyl pentane	C_6H_{14}	4.8	6.0	6.5	8.2	10.2	12.1	13.8	15.4	−0.06762	0.26309	−0.07101		
3-Methyl pentane	C_6H_{14}	4.9	6.0	6.6	8.3	10.3	12.3	14.1	15.8	−0.07196	0.26542	−0.06661		
2,2-Dimethyl butane	C_6H_{14}	5.3	6.4	7.0	8.6	10.7	12.6	14.4	16.1	−0.01151	0.25664	−0.06103		
2,3-Dimethyl butane	C_6H_{14}	5.2	6.4	7.0	8.8	11.0	13.0	14.9	16.7	−0.07160	0.28230	−0.07453		
Olefins														
Ethylene	C_2H_4	7.6	9.3	10.1	12.5	15.5	18.2	20.6	22.9	−0.06216	0.39695	−0.12059		
Propylene	C_3H_6	6.3	7.8	8.6	10.7	13.4	15.9	18.2	20.4	−0.08571	0.34209	−0.08730		
1-Butene	C_4H_8	5.7	7.1	7.7	9.7	12.1	14.4	16.6	18.5	−0.08782	0.31254	−0.07958		
1-Pentene	C_5H_{10}	5.3	6.5	7.1	8.9	11.2	13.3	15.3	17.1	−0.07462	0.28548	−0.07046		
1-Hexene	C_6H_{12}	4.8	6.0	6.5	8.1	10.2	12.0	13.8	15.4	−0.06612	0.26302	−0.07209		
1-Heptene	C_7H_{14}	4.7	5.8	6.4	8.0	10.0	11.9	13.8	15.6	−0.05798	0.25536	−0.08534	0.00392	−0.00072
1-Octene	C_8H_{16}	4.4	5.4	5.9	7.3	9.1	10.7	12.3	13.7	−0.05166	0.23337	−0.06468		
Propadiene	C_3H_4	6.2	7.5	8.2	10.0	12.3	14.4	16.2	17.9	−0.01925	0.30937	−0.09700		
1,2-Butadiene	C_4H_6	5.6	6.8	7.4	9.1	11.2	13.1	14.9	16.5	−0.03543	0.28468	−0.08701		
1,3-Butadiene	C_4H_6	6.3	7.8	8.5	10.5	13.1	15.6	17.9	20.0	−0.05408	0.32462	−0.07543		
1,2-Pentadiene	C_5H_8	5.1	6.2	6.7	8.3	10.3	12.1	13.7	15.2	−0.04030	0.26299	−0.07884		
trans-1,3-Pentadiene	C_5H_8				8.2	10.1	11.8	13.4	14.9	0.03342	0.23396	−0.05955		
1,4-Pentadiene	C_5H_8				8.8	11.1	13.2	15.2	17.1	−0.08176	0.28139	−0.06431		
2,3-Pentadiene	C_5H_8	5.1	6.3	6.8	8.5	10.6	12.6	14.4	16.1	−0.04668	0.26365	−0.06320		
Acetylene and Derivatives														
Acetylene	C_2H_2	7.6	9.4	10.2	12.7	15.7	18.5			−0.11075	0.42019	−0.13611		
Propyne	C_3H_4	6.4	7.9	8.6	10.7	13.3	15.7	17.9	19.9	−0.08716	0.34947	−0.10490		
2-Butyne	C_4H_6		6.9	7.5	9.4	11.8	14.0	16.1	18.0	−0.08278	0.30252	−0.07563		
1-Butyne	C_4H_6	5.4	6.8	7.4	9.3	11.8	14.1	16.3	18.4	−0.09787	0.30050	−0.06407		
Naphthenes														
Cyclopropane	C_3H_6	6.6	8.1	8.9	11.0	13.6	16.1	18.3	20.4	−0.07419	0.35270	−0.10321		
Cyclobutane	C_4H_8	6.0	7.4	8.1	10.1	12.6	14.9	17.1	19.1	−0.07904	0.32310	−0.08579		
Cyclopentane	C_5H_{10}	5.6	6.9	7.5	9.3	11.6	13.8	15.9	17.8	−0.04981	0.28692	−0.06427		
Methyl cyclopentane	C_6H_{12}	5.1	6.3	6.9	8.7	10.9	13.0	15.0	16.8	−0.08377	0.28117	−0.06915		
Ethyl cyclopentane	C_7H_{14}	4.8	5.9	6.5	8.1	10.2	12.2	14.0	15.7	−0.07561	0.26139	−0.06289		
Propyl cyclopentane	C_8H_{16}	4.7	5.8	6.3	7.8	9.8	11.6	13.3	14.8	−0.06188	0.25185	−0.06740		
Butyl cyclopentane	C_9H_{18}	4.4	5.4	5.9	7.4	9.2	10.9	12.4	13.9	−0.05389	0.23625	−0.06461		
Pentyl cyclopentane	$C_{10}H_{20}$	4.1	5.0	5.4	6.7	8.5	10.3	12.1	13.8	0.10176	0.10630	0.18840	−0.01918	0.00597
Hexyl cyclopentane	$C_{11}H_{22}$	3.9	4.6	5.0	6.3	8.0	9.6	11.3	12.9	0.09880	0.09722	0.17809	−0.01789	0.00553
Cyclohexane	C_6H_{12}			7.1	8.7	10.9	12.9	14.9	16.9	0.02184	0.24010	−0.03187		
Methyl cyclohexane	C_7H_{14}	4.8	5.9	6.5	8.2	10.3	12.2	14.1	15.8	−0.07951	0.26416	−0.06422		

D3.1. Table 8. (continued)

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
Ethyl cyclohexane	C_8H_{16}	4.4	5.5	6.0	7.5	9.3	11.1	12.7	14.2	−0.05710	0.23787	−0.06047		
Propyl cyclohexane	C_9H_{18}	4.2	5.2	5.7	7.1	8.8	10.5	12.0	13.4	−0.06014	0.22794	−0.05991		
Butyl cyclohexane	$C_{10}H_{20}$	4.0	4.9	5.4	6.7	8.3	9.9	11.3	12.6	−0.04605	0.21223	−0.05550		
Pentyl cyclohexane	$C_{11}H_{22}$	3.9	4.7	5.1	6.3	8.0	9.7	11.4	13.0	0.10143	0.09711	0.17962	−0.01790	0.00551
Hexyl cyclohexane	$C_{12}H_{24}$	4.0	4.8	5.2	6.4	8.1	9.9	11.6	13.2	0.11242	0.09394	0.18952	−0.01844	0.00561
Cyclopentene	C_5H_8	5.8	7.2	7.8	9.8	12.3	14.6	16.8	18.8	−0.07481	0.30921	−0.07262		
Cyclohexene	C_6H_{10}	5.2	6.5	7.1	8.9	11.2	13.4	15.4	17.3	−0.09348	0.28961	−0.06919		
Aromatic compounds														
Benzene	C_6H_6			7.6	9.4	11.9	14.4	16.9	19.3	0.00177	0.25542	−0.00711		
Toluene	C_7H_8	5.1	6.4	7.0	8.7	10.8	12.9	14.8	16.5	−0.07109	0.27885	−0.07300		
Ethyl benzene	C_8H_{10}	4.7	5.9	6.4	8.0	10.1	12.0	13.8	15.5	−0.06862	0.25645	−0.06139		
Propyl benzene	C_9H_{12}	4.5	5.5	6.1	7.6	9.5	11.4	13.1	14.7	−0.06657	0.24175	−0.05492		
Butyl benzene	$C_{10}H_{14}$	4.2	5.3	5.8	7.2	9.1	10.8	12.5	14.0	−0.06561	0.23072	−0.05302		
Pentyl benzene	$C_{11}H_{16}$	4.0	5.0	5.4	6.8	8.5	10.1	11.6	13.0	−0.05520	0.21706	−0.05321		
Hexyl benzene	$C_{12}H_{18}$	3.9	4.8	5.2	6.5	8.1	9.6	11.0	12.2	−0.04233	0.20516	−0.05370		
o-Xylene	C_8H_{10}		5.8	6.4	8.0	10.0	12.0	13.8	15.5	−0.07549	0.25676	−0.06047		
m-Xylene	C_8H_{10}		5.8	6.4	8.0	10.1	12.0	13.8	15.5	−0.07474	0.25782	−0.06128		
p-Xylene	C_8H_{10}			6.3	7.9	9.9	11.7	13.5	15.1	−0.05863	0.24914	−0.06026		
1,2,3-Trimethyl benzene	C_9H_{12}		5.5	6.1	7.6	9.6	11.4	13.1	14.7	−0.07172	0.24462	−0.05774		
1,2,4-Trimethyl benzene	C_9H_{12}		5.5	6.0	7.5	9.4	11.2	12.9	14.4	−0.06620	0.23995	−0.05812		
1,3,5-Trimethyl benzene	C_9H_{12}		5.3	5.8	7.3	9.2	11.0	12.6	14.2	−0.05772	0.23072	−0.05097		
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$		5.2	5.7	7.2	9.1	10.9	12.8	14.5	−0.03426	0.20863	−0.02088		
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$		5.2	5.7	7.1	8.9	10.6	12.2	13.6	−0.05896	0.22610	−0.05454		
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$				7.0	8.7	10.4	11.9	13.3	−0.02841	0.21491	−0.05071		
Pentamethyl benzene	$C_{11}H_{16}$				6.8	8.6	10.3	11.9	13.3	−0.07246	0.22029	−0.04972		
Hexamethyl benzene	$C_{12}H_{18}$					8.3	9.9	11.5	13.0	−0.07149	0.21074	−0.04305		
Styrene	C_8H_8		5.9	6.4	8.0	10.0	11.9	13.6	15.3	−0.05863	0.25269	−0.06181		
Isopropyl benzene	C_9H_{12}	4.5	5.6	6.1	7.7	9.7	11.5	13.3	14.9	−0.06816	0.24574	−0.05656		
Biphenyl	$C_{12}H_{10}$				6.8	8.8	10.6	12.4	14.1	−0.11853	0.22925	−0.04067		
Diphenyl methane	$C_{13}H_{12}$				7.0	8.7	10.4	12.1	13.8	0.03209	0.18126	−0.00911		
Triphenyl methane	$C_{19}H_{16}$				5.9	7.5	9.0	10.6	12.1	−0.02175	0.16673	−0.00881		
Tetraphenyl methane	$C_{25}H_{20}$						7.8	9.1	10.5	−0.05425	0.15092	−0.01080		
Naphthalene	$C_{10}H_8$				7.6	9.6	11.6	13.5	15.3	−0.10205	0.24744	−0.04743		
1-Methylnaphthalene	$C_{11}H_{10}$		5.2	5.7	7.2	9.2	11.0	12.8	14.4	−0.08065	0.23138	−0.04407		
2-Methylnaphthalene	$C_{11}H_{10}$				7.1	9.0	10.8	12.5	14.0	−0.07835	0.23048	−0.04996		
1-Ethylnaphthalene	$C_{12}H_{12}$		4.8	5.3	6.6	8.2	9.8	11.3	12.6	−0.04469	0.20718	−0.04940		
2-Ethylnaphthalene	$C_{12}H_{12}$		5.0	5.5	6.9	8.8	10.5	12.2	13.7	−0.08142	0.22516	−0.04792		
Alcohols														
Methanol	CH_4O		8.7	9.6	12.2	15.6	18.8	22.0	24.9	−0.15159	0.39270	−0.06541		
Ethanol	C_2H_6O	6.7	8.2	8.9	11.0	13.7	16.3	18.8	21.2	−0.06394	0.36445	−0.17984	0.01280	−0.00413
1-Propanol	C_3H_8O	5.4	6.9	7.6	9.7	12.4	15.0	17.5	19.9	−0.14675	0.32078	−0.05720		
1-Butanol	$C_4H_{10}O$	5.0	6.3	6.9	8.8	11.2	13.5	15.7	17.8	−0.11787	0.28940	−0.05708		
1-Pentanol	$C_5H_{12}O$					10.5	12.6	14.6	16.5	−0.05553	0.25174	−0.03963		
1-Hexanol	$C_6H_{14}O$		5.6	6.1	7.7	9.8	11.8	13.7	15.6	−0.07635	0.24326	−0.04168		
1-Heptanol	$C_7H_{16}O$		5.2	5.7	7.2	9.2	11.2	13.0	14.7	−0.09367	0.23519	−0.04239		
1-Octanol	$C_8H_{18}O$		4.9	5.4	6.9	8.8	10.6	12.3	14.0	−0.08403	0.22020	−0.03669		
Isopropanol	C_3H_8O	5.5	7.0	7.7	9.8	12.5	15.0	17.5	19.9	−0.11534	0.31142	−0.05033		
2-Methyl-1-propanol	$C_4H_{10}O$	5.3	6.6	7.3	9.2	11.7	14.0	16.2	18.4	−0.10257	0.29598	−0.05854		
3-Methyl-1-butanol	$C_5H_{12}O$	5.1	6.3	6.9	8.6	10.8	12.9	15.0	17.0	−0.04325	0.25708	−0.04134		
Ethylene glycol	$C_2H_6O_2$		7.5	8.3	10.4	13.1	15.8	18.4	21.0	−0.05600	0.30619	−0.03555		
1,3-Propylene glycol	$C_3H_8O_2$		6.8	7.4	9.4	12.0	14.5	17.1	19.6	−0.03782	0.26432	−0.00784		
Glycerol	$C_3H_8O_3$			6.8	8.5	10.8	13.1	15.4	17.7	−0.00146	0.22666	0.00328		

D3.1. Table 8. (continued)

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
Cyclohexanol	$C_6H_{12}O$			7.0	8.9	11.3	13.7	16.1	18.4	−0.08693	0.27102	−0.02804		
Benzyl alcohol	C_7H_8O		6.0	6.6	8.3	10.5	12.7	14.8	16.8	−0.04461	0.24537	−0.02845		
Phenols														
o-Cresol	C_7H_8O				8.3	10.5	12.6	14.7	16.7	−0.05130	0.24653	−0.03094		
m-Cresol	C_7H_8O			6.4	8.2	10.4	12.6	14.7	16.7	−0.09147	0.25736	−0.03778		
p-Cresol	C_7H_8O				8.3	10.5	12.7	14.8	16.8	−0.08575	0.25847	−0.03823		
Phenol	C_6H_6O				9.0	11.4	13.7	15.9	18.1	−0.05584	0.26838	−0.03487		
Carboxylic acids														
Formic acid	CH_2O_2			9.3	11.8	14.9	18.0	20.9	23.7	−0.11464	0.37037	−0.06416		
Acetic acid	$C_2H_4O_2$			8.6	10.8	13.8	16.8	19.8	22.8	−0.02958	0.29595	0.00377		
Propionic acid	$C_3H_6O_2$		6.7	7.3	9.3	11.9	14.4	16.7	19.0	−0.10200	0.29386	−0.04443		
Butyric acid	$C_4H_8O_2$		6.3	6.9	8.7	11.0	13.3	15.4	17.6	−0.04956	0.25868	−0.03263		
Valeric acid	$C_5H_{10}O_2$		6.1	6.7	8.4	10.6	12.7	14.8	16.8	−0.05626	0.25433	−0.03911		
Caproic acid	$C_6H_{12}O_2$		5.6	6.1	7.6	9.7	11.6	13.5	15.4	−0.04646	0.22877	−0.03110		
Acetic anhydride	$C_4H_6O_3$	5.9	7.3	8.0	10.1	12.9	15.5	18.0	20.4	−0.07992	0.31028	−0.04599		
Propionic anhydride	$C_6H_{10}O_3$		5.4	5.9	7.4	9.3	11.2	13.0	14.8	−0.03616	0.21856	−0.02950		
Chloroacetic acid	$C_2H_3ClO_2$				10.5	13.3	16.0	18.6	21.2	−0.07379	0.31522	−0.04103		
Dichloroacetic acid	$C_2H_2Cl_2O_2$			8.3	10.4	13.2	15.9	18.5	21.0	−0.06382	0.31055	−0.03966		
Trichloroacetic acid	$C_2HCl_3O_2$				10.3	13.0	15.6	18.2	20.7	−0.04675	0.30091	−0.03513		
Ketones														
Ketene	C_2H_2O	7.6	9.4	10.4	13.0	16.4	19.5	22.5	25.2	−0.12721	0.41928	−0.09870		
Acetone	C_3H_6O	5.5	6.8	7.5	9.5	12.1	14.7	17.3	19.9	−0.04063	0.26639	−0.00533		
Methyl ethyl ketone	C_4H_8O	5.5	6.6	7.2	9.0	11.3	13.7	16.1	18.5	0.03088	0.22920	0.00704		
Diethyl ketone	$C_5H_{10}O$		6.0	6.5	8.2	10.3	12.4	14.3	16.2	−0.04632	0.24695	−0.04071		
Dipropyl ketone	$C_7H_{14}O$		5.3	5.8	7.3	9.2	11.0	12.7	14.4	−0.04379	0.21864	−0.03379		
Acetophenone	C_8H_8O			6.5	8.2	10.5	12.8	15.0	17.2	−0.05627	0.24178	−0.01586		
Benzophenone	$C_{13}H_{10}O$				6.3	8.2	10.0	11.7	13.4	−0.12330	0.21440	−0.03233		
Ethers														
Dimethyl ether	C_2H_6O	6.8	8.4	9.2	11.6	14.5	17.3	19.9	22.3	−0.10763	0.37311	−0.09094		
Diethyl ether	$C_4H_{10}O$	5.6	6.9	7.6	9.5	11.9	14.1	16.2	18.2	−0.08933	0.30626	−0.07705		
Dipropyl ether	$C_6H_{14}O$	5.2	6.2	6.7	8.2	10.1	12.1	13.9	15.8	0.04652	0.21533	−0.02252		
Methyl propyl ether	$C_4H_{10}O$	5.7	6.9	7.6	9.4	11.8	14.0	16.2	18.2	−0.02933	0.27827	−0.04984		
Ethyl propyl ether	$C_5H_{12}O$	5.0	6.2	6.8	8.6	10.9	13.0	15.0	16.9	−0.09340	0.27850	−0.06111		
Ethylene oxide	C_2H_4O	7.0	8.7	9.5	11.9	15.0	18.1	21.0	23.9	−0.07074	0.35618	−0.04906		
Furane	C_2H_4O	6.2	7.8	8.6	11.0	14.0	16.9	19.6	22.2	−0.14789	0.36008	−0.06896		
1,4-Dioxane	$C_4H_8O_2$			12.9	16.1	20.3	24.4	28.3	32.0	−0.09914	0.48891	−0.08042		
Aldehydes														
Formaldehyde	CH_2O	8.8	10.8	11.8	14.7	18.3	21.7	25.0	28.0	−0.08285	0.45568	−0.10791		
Acetaldehyde	C_2H_4O	6.4	7.8	8.6	10.7	13.4	16.0	18.5	20.9	−0.04826	0.32014	−0.05638		
Paraldehyde	$C_6H_{12}O_3$			7.7	9.8	12.7	15.4	18.0	20.5	−0.16710	0.32863	−0.05351		
Furfural	$C_5H_4O_2$		7.3	8.0	10.1	12.9	15.6	18.3	21.0	−0.05317	0.29341	−0.02009		
Benzaldehyde	C_7H_6O	4.7	5.9	6.5	8.2	10.5	12.6	14.8	16.8	−0.07865	0.25494	−0.03580		
Salicylaldehyde	$C_7H_6O_2$			6.3	8.0	10.1	12.1	14.1	16.0	−0.04767	0.23738	−0.03080		
Esters														
Methyl formate	$C_2H_4O_2$	6.8	8.6	9.4	12.0	15.3	18.4	21.4	24.3	−0.13632	0.38184	−0.06475		
Ethyl formate	$C_3H_6O_2$	6.0	7.6	8.4	10.8	13.8	16.6	19.4	22.0	−0.15589	0.35441	−0.06412		
Propyl formate	$C_4H_8O_2$	5.5	7.0	7.7	9.9	12.6	15.3	17.9	20.3	−0.14742	0.32392	−0.05416		
Methyl acetate	$C_3H_6O_2$		7.2	8.0	10.2	13.0	15.7	18.2	20.6	−0.15412	0.33832	−0.06684		
Ethyl acetate	$C_4H_8O_2$	5.6	6.9	7.6	9.6	12.0	14.4	16.5	18.6	−0.09641	0.30876	−0.07229		
Propyl acetate	$C_5H_{10}O_2$	4.9	6.2	6.8	8.6	10.8	13.0	15.1	17.0	−0.08641	0.27161	−0.05164		
Methyl propionate	$C_4H_8O_2$	5.4	6.7	7.4	9.3	11.8	14.1	16.4	18.5	−0.10184	0.29907	−0.06099		
Ethyl propionate	$C_5H_{10}O_2$	6.6	8.3	9.1	11.5	14.6	17.6	20.4	23.0	−0.13863	0.37449	−0.07577		

D3.1. Table 8. (continued)

Substance	Formula	Temperature (°C)								Equation (3)				
		−50	0	25	100	200	300	400	500	10^5 *A*	10^7 *B*	10^{10} *C*	10^{12} *D*	10^{15} *E*
Propyl propionate	$C_6H_{12}O_2$	4.6	5.7	6.3	8.0	10.1	12.2	14.1	16.0	−0.08710	0.25499	−0.04799		
Methyl butyrate	$C_5H_{10}O_2$	4.9	6.2	6.8	8.6	10.9	13.0	15.1	17.1	−0.09985	0.27719	−0.05607		
Ethyl butyrate	$C_6H_{12}O_2$	4.5	5.7	6.3	8.0	10.1	12.2	14.1	16.0	−0.09654	0.25850	−0.05101		
Methyl benzoate	$C_8H_8O_2$					10.1	12.1	14.1	16.1	−0.03621	0.23330	−0.02657		
Ethyl benzoate	$C_9H_{10}O_2$		5.5	6.0	7.5	9.5	11.4	13.3	15.2	−0.03954	0.22199	−0.02695		
Methyl salicylate	$C_8H_8O_3$		5.6	6.1	7.7	9.7	11.7	13.6	15.5	−0.04401	0.22727	−0.02759		
Amines														
Methyl amine	CH_5N	6.6	8.2	8.9	11.2	14.0	16.7	19.2	21.5	−0.09272	0.35586	−0.08531		
Ethyl amine	C_2H_7N	5.9	7.3	8.0	10.0	12.6	15.0	17.3	19.4	−0.09010	0.31981	−0.07363		
Propyl amine	C_3H_9N	5.5	6.7	7.4	9.2	11.5	13.8	15.9	17.9	−0.05315	0.28073	−0.05425		
n-butyl amine	$C_4H_{11}N$		6.2	6.8	8.5	10.7	12.8	14.8	16.7	−0.05588	0.26084	−0.04835		
Dimethyl amine	C_2H_7N	7.0	8.6	9.3	11.6	14.5	17.3	19.9	22.3	−0.06089	0.35730	−0.07854		
Trimethyl amine	C_3H_9N	5.7	7.1	7.8	9.9	12.5	15.0	17.4	19.6	−0.11661	0.32114	−0.06794		
Diethyl amine	$C_4H_{11}N$		6.7	7.3	9.2	11.7	14.0	16.1	18.2	−0.09105	0.29587	−0.06378		
Triethyl amine	$C_6H_{15}N$	4.9	6.2	6.8	8.7	11.1	13.4	15.6	17.8	−0.11188	0.27992	−0.04612		
Piperidine	$C_5H_{11}N$					11.3	13.7	16.0	18.3	−0.14811	0.29184	−0.04677		
Pyridine	C_5H_5N		6.7	7.3	9.3	11.9	14.4	16.9	19.4	−0.07020	0.27549	−0.02026		
Aniline	C_6H_7N		6.0	6.7	8.5	10.8	13.0	15.2	17.3	−0.09488	0.26669	−0.03931		
N-Methyl aniline	C_7H_9N	5.1	6.3	6.9	8.6	10.8	13.1	15.2	17.3	−0.03068	0.24766	−0.02540		
N,N-dimethyl aniline	$C_8H_{11}N$			5.9	7.4	9.5	11.5	13.5	15.5	−0.05089	0.21904	−0.01598		
N,N-diethyl aniline	$C_{10}H_{15}N$		5.1	5.6	7.0	8.9	10.7	12.5	14.2	−0.01689	0.19904	−0.01628		
Phenylhydrazine	$C_6H_8N_2$			6.2	7.8	9.9	11.9	14.0	15.9	−0.02900	0.22291	−0.01672		
Diphenyl amine	$C_{12}H_{11}N$				7.0	9.0	10.8	12.7	14.5	−0.06505	0.21491	−0.02526		
Nitriles														
Acetonitrile	C_2H_3N		6.5	7.1	8.9	11.2	13.5	15.7	17.9	−0.01722	0.25237	−0.02396		
Propionitrile	C_3H_5N	5.0	6.1	6.7	8.3	10.5	12.6	14.6	16.5	−0.04528	0.25157	−0.04200		
Butyronitrile	C_4H_7N	4.7	5.8	6.3	7.9	9.9	11.9	13.7	15.6	−0.03917	0.23503	−0.03726		
Benzonitrile	C_7H_5N		6.4	7.0	8.9	11.3	13.7	16.1	18.4	−0.04813	0.25611	−0.01517		
Amides														
Formamide	CH_3NO			8.6	10.7	13.6	16.4	19.1	21.8	−0.04372	0.31013	−0.02858		
Nitroderivates														
Nitromethane	CH_3NO_2		6.6	7.3	9.6	12.4	15.2	18.0	20.6	−0.18903	0.32181	−0.04020		
Nitrobenzene	$C_6H_5NO_2$			6.8	8.9	11.6	14.2	16.8	19.4	−0.16371	0.29108	−0.02490		
o-Nitrotoluene	$C_7H_7NO_2$		5.8	6.3	8.0	10.2	12.4	14.5	16.7	−0.04061	0.22985	−0.01161		
m-Nitrotoluene	$C_7H_7NO_2$			6.3	7.9	10.1	12.3	14.4	16.5	−0.04500	0.22850	−0.01162		
p-Nitrotoluene	$C_7H_7NO_2$				7.8	10.0	12.2	14.3	16.4	−0.05845	0.23080	−0.01379		

D3.1. Table 9. Thermal conductivity of saturated liquids in W/mK

Substance	Formula	Temperature (°C)								Equation (4)				
		−50	−25	0	20	50	100	150	200	*A*	10^2 *B*	10^4 *C*	10^7 *D*	10^{10} *E*
Elements														
Xenon	Xe	0.049	0.039							0.1372	−0.03997	0.00074	−0.00377	0.00562
Krypton	Kr									0.1728	−0.06558	−0.00193	−0.00094	0.01428
Argon	Ar									0.1821	−0.03726	−0.02781	−0.11115	0.30999
Air										−0.0006	0.95952	−1.70225	11.14335	−26.70110
Nitrogen	N_2									0.2621	−0.15793	−0.00737	−0.01546	0.23198
Oxygen	O_2									0.2716	−0.12812	−0.01371	0.08022	−0.16812
Sulfur	S							0.138	0.152	−0.0986	0.06958	0.00029	−0.01067	0.00553
Fluorine	F_2									0.2755	−0.16169	−0.00200	0.01254	−0.02573
Chlorine	Cl_2	0.171	0.160	0.148	0.138	0.122	0.091			0.2265	−0.00950	−0.00608	−0.00441	0.00391
Bromine	Br_2			0.129	0.125	0.117	0.105	0.093	0.081	−0.1426	0.34711	−0.15092	0.26902	−0.17744
Iodine	I_2							0.112	0.105	0.1156	0.00461	0.00003	−0.00384	0.00158
Anorganic compounds														
Hydrogen fluoride	HF	0.509	0.482	0.455	0.433	0.400	0.346			0.7335	−0.08293	−0.01349	0.03071	−0.02573
Hydrogen chloride	HCl			0.230	0.188	0.125				0.6690	−0.09277	−0.02690	−0.01103	0.06800
Hydrogen bromide	HBr	0.131	0.119	0.107						0.2371	−0.04914	0.00020	0.00372	−0.00821
Hydrogen iodide	HI		0.049	0.046	0.043	0.039	0.030			0.1510	−0.06435	0.00443	0.03809	−0.07231
Hydrogen cyanide	HCN			0.243	0.229					0.4031	−0.04529	−0.00361	−0.01167	0.02592
Water	H_2O			0.555	0.598	0.643	0.680	0.682	0.661	−2.4149	2.45165	−0.73121	0.99492	−0.53730
Hydrogen sulfide	H_2S	0.220	0.190	0.161						0.4588	−0.08190	−0.01903	0.04211	−0.03272
Ammonia	NH_3	0.602	0.563	0.518	0.478	0.416	0.298			−0.5047	1.74960	−0.92075	1.97003	−1.61999
Nitric oxide	NO									0.2268	0.01517	−0.02647	−0.19936	0.14484
Nitrogen dioxide	NO_2			0.157						0.3147	−0.05645	−0.00064	0.00262	−0.00698
Nitrous oxide	N_2O									0.1011				
Dinitrogentetroxide	N_2O_4					0.131				0.1864	0.01841	−0.01083	−0.00544	0.01509
Cyanogen	C_2N_2		0.254							0.3376	−0.01640	0.00048	−0.00449	−0.10407
Phosphorus trichloride	PCl_3	0.146	0.140	0.134	0.129	0.121	0.109			0.2008	−0.02466			
Cyanogen chloride	ClCN			0.175						0.2788	−0.03245	−0.00008	−0.00364	−0.01280
Silane	SiH_4	0.056	0.032							0.2764	−0.09858			
Tetrachlorosilane	$SiCl_4$			0.103	0.100	0.096				0.1371	−0.01265			
Carbon monoxide	CO									0.2845	−0.17440	−0.00543	0.02657	−0.02637
Carbon dioxide	CO_2	0.169	0.139	0.108	0.084					0.3881	−0.06561	−0.01769	0.00700	0.03031
Carbon suboxide	C_3O_2	0.159	0.149	0.138	0.128	0.113	0.084			0.2203	0.00745	−0.02962	0.08522	−0.10022

D3.1. Table 9. (continued)

Substance	Formula	Temperature (°C)								Equation (4)				
		−50	−25	0	20	50	100	150	200	A	$10^2\ B$	$10^4\ C$	$10^7\ D$	$10^{10}\ E$
Carbonyl sulfide	COS									0.2620	−0.05256	0.00567	−0.02701	0.04524
Phosgene	CCl_2O	0.150	0.144	0.138						0.2004	−0.01457	−0.00721	0.02243	−0.02587
Carbon disulfide	CS_2	0.172	0.165	0.158	0.153					0.2301	−0.02261	−0.00269	0.00630	−0.00523
Sulfur dioxide	SO_2	0.243	0.227	0.211	0.199	0.180	0.149			0.3833	−0.06393	0.00065	−0.00130	0.00096
Sulfur trioxide	SO_3				0.254	0.211	0.150	0.102	0.067	0.8854	−0.26459	0.01050	0.02624	−0.01586
Sulfuryl chloride	Cl_2SO_2	0.148	0.141	0.135	0.129	0.121				0.2029	−0.02307	−0.00003	−0.00468	0.00811
Sulfur hexafluoride	SF_6	0.107	0.091	0.074	0.061					0.2444	−0.05733	−0.00157	−0.00339	0.00914
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	0.176	0.166	0.156						0.2492	−0.01542	−0.01615	0.04983	−0.05680
Ethyl mercaptan	C_2H_6S	0.162	0.154	0.146	0.140					0.2336	−0.03104	−0.00100	0.00389	−0.00522
Dimethyl sulfide	C_2H_6S	0.166	0.157	0.149	0.142					0.2365	−0.02907	−0.00203	0.00431	−0.00321
Diethyl sulfide	$C_4H_{10}S$	0.152	0.146	0.139	0.134	0.126				0.2119	−0.02688	−0.00039	0.00280	−0.00416
Thiophene	C_4H_4S		0.156	0.151	0.147	0.141				0.2031	−0.01367	−0.00462	0.01347	−0.01388
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	0.217	0.191	0.166						0.4469	−0.10555	0.00200	−0.00503	0.00417
Difluoromethane (R32)	CH_2F_2	0.188	0.167	0.147	0.131					0.3594	−0.06623	−0.01007	0.03153	−0.03617
Trifluoromethane (R23)	CHF_3	0.109								0.2216	−0.02927	−0.02195	0.07958	−0.10654
Tetrafluoromethane (R14)	CF_4									0.2200	−0.09284	−0.00627	0.09634	−0.17838
Methyl chloride	CH_3Cl	0.221	0.200	0.179	0.162	0.137				0.4125	−0.08698	0.00096	−0.00171	0.00103
Methylene chloride	CH_2Cl_2	0.164	0.156	0.147	0.141	0.131				0.2449	−0.04325	0.00563	−0.01401	0.01288
Chloroform	$CHCl_3$	0.133	0.128	0.123	0.118	0.112	0.102			0.1773	−0.01965	−0.00020	0.00020	0.00005
Carbon tetrachloride	CCl_4			0.105	0.101	0.095				0.1509	−0.01298	−0.00156	−0.00071	0.00398
Bromomethane	CH_3Br	0.124	0.117	0.109	0.104	0.095				0.1885	−0.02596	−0.00217	0.00518	−0.00456
Dibromomethane	CH_2Br_2	0.125	0.120	0.114	0.110	0.103				0.1724	−0.01869	−0.00166	0.00309	−0.00203
Tribromomethane	$CHBr_3$				0.100	0.095	0.088			0.1476	−0.01496	−0.00122	0.00389	−0.00383
Tetrabromomethane	CBr_4						0.083	0.077	0.071	0.1310	−0.01303	−0.00001	−0.00003	0.00041
Chlorodifluoromethane (R22)	$CHClF_2$	0.12	0.109	0.097	0.088	0.075				0.2211	−0.04472	−0.00061	0.00210	−0.00241
Dichlorofluoromethane (R21)	$CHCl_2F$	0.128	0.119	0.110	0.102	0.091	0.073			0.2104	−0.03641	−0.00024	0.00024	0.00015
Chlorotrifluoromethane (R13)	$CClF_3$	0.082	0.069	0.056	0.046					0.1950	−0.05177	0.00095	−0.00340	0.00432
Dichlorodifluoromethane (R12)	CCl_2F_2	0.103	0.092	0.081	0.073	0.059				0.2016	−0.04522	0.00090	−0.00227	0.00212
Trichlorofluoromethane (R11)	CCl_3F	0.115	0.106	0.098	0.092	0.082	0.066			0.1863	−0.03138	−0.00054	0.00107	−0.00077
Ethyl fluoride (R161)	C_2H_5F	0.148	0.135	0.123						0.2590	−0.04949	−0.00012	−0.00053	0.00161
Ethyl chloride	C_2H_5Cl	0.150	0.140	0.129	0.121	0.108	0.087			0.2416	−0.03815	−0.00223	0.00563	−0.00509

Ethyl bromide	C_2H_5Br	0.121	0.115	0.108	0.103	0.095	0.082			0.1780	−0.02343	−0.00143	0.00321	−0.00262
1,1-Dichloroethane	$C_2H_4Cl_2$	0.131	0.124	0.118	0.112	0.105	0.092			0.1888	−0.02598	−0.00015	0.00055	−0.00058
1,2-Dichloroethane	$C_2H_4Cl_2$			0.141	0.136	0.128				0.2140	−0.02654	−0.00002		
1,2-Dibromoethane	$C_2H_4Br_2$				0.102	0.098	0.092			0.1313	−0.00855	−0.00025	−0.00182	0.00300
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	0.104	0.093	0.082						0.1742	−0.02303	−0.00300	−0.00627	0.01123
1,1,1-Trichloroethane	$C_2H_3Cl_3$		0.111	0.106	0.102	0.096	0.086	0.076	0.066	0.1593	−0.01887	−0.00027	0.00014	0.00014
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$				0.114	0.108	0.099			0.1622	−0.01468	−0.00061	−0.00061	0.00162
Pentachloroethane	C_2HCl_5		0.102	0.098	0.095	0.090	0.083	0.075	0.067	0.1379	−0.01362	−0.00063	0.00108	−0.00067
Hexachloroethane	C_2Cl_6								0.066	0.0559	0.02715	−0.00627	0.00044	0.00350
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$					0.077	0.070	0.062	0.054	0.1263	−0.01442	−0.00058	0.00147	−0.00122
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		0.085	0.079	0.075	0.069	0.058	0.048		0.1404	−0.02415	0.00098	−0.00131	0.00053
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	0.083	0.076	0.070	0.065	0.058	0.046			0.1382	−0.02496	0.00001	0.00019	−0.00030
1-Chloropropane	C_3H_7Cl	0.137	0.130	0.122	0.117	0.108	0.094			0.2004	−0.02756	−0.00062	0.00111	−0.00064
1-Chlorobutane	C_4H_9Cl	0.139	0.132	0.125	0.120	0.112	0.099			0.1985	−0.02671	−0.00008	0.00030	−0.00038
1-Chloropentane	$C_5H_{11}Cl$	0.134	0.128	0.122	0.117	0.110	0.098	0.086		0.1870	−0.02372	−0.00005	0.00010	−0.00008
Chlorotrifluoroethene	C_2ClF_3	0.096	0.088	0.080	0.074	0.064	0.048			0.1671	−0.03202	0.00003	0.00010	−0.00027
Vinyl chloride	C_2H_3Cl	0.146	0.136	0.126	0.118	0.107				0.2326	−0.03792	−0.00091	0.00274	−0.00303
1,1-Dichloroethene	$C_2H_2Cl_2$	0.127	0.119	0.112	0.107	0.098	0.084			0.1900	−0.02748	−0.00079	0.00219	−0.00220
Trichloroethene	C_2HCl_3	0.137	0.130	0.122	0.116	0.108				0.2069	−0.03658	0.00406	−0.00961	0.00841
Tetrachloroethene	C_2Cl_4			0.116	0.111	0.104	0.091			0.1862	−0.02656	0.00059	−0.00111	0.00079
Fluorobenzene	C_6H_5F		0.140	0.133	0.127	0.119				0.1968	−0.01565	−0.00363	0.00207	0.00333
Chlorobenzene	C_6H_5Cl		0.137	0.132	0.128	0.122	0.113			0.1831	−0.01817	−0.00034	0.00045	−0.00016
Bromobenzene	C_6H_5Br		0.121	0.116	0.112	0.106	0.096	0.086		0.1677	−0.01823	−0.00023	−0.00051	0.00107
Iodobenzene	C_6H_5I		0.105	0.102	0.100	0.097	0.092	0.087		0.1313	−0.01133	0.00049	−0.00093	0.00066
m-chlorotoluene	C_7H_7Cl		0.136	0.131	0.127	0.121	0.111	0.101		0.1860	−0.02044	0.00012	−0.00004	−0.00015
Benzyl chloride	C_7H_7Cl		0.145	0.140	0.136	0.130	0.121	0.111	0.101	0.1923	−0.01925		0.00002	−0.00003
***n*-Alkanes**														
Methane	CH_4									0.4011	−0.19773	−0.01440	0.22814	−0.38138
Ethane	C_2H_6	0.133	0.111	0.091	0.075					0.3505	−0.09878	−0.00627	0.04136	−0.04929
Propane	C_3H_8	0.133	0.120	0.107	0.097	0.082				0.2661	−0.06336	0.00057	0.00655	−0.00701
n-Butane	C_4H_{10}	0.140	0.128	0.117	0.109	0.097	0.079			0.2699	−0.06508	0.00136	0.00992	−0.00933
n-Pentane	C_5H_{12}	0.142	0.132	0.122	0.114	0.103	0.087	0.072		0.2529	−0.05640	0.00284	0.00123	−0.00089
n-Hexane	C_6H_{14}	0.146	0.137	0.128	0.121	0.111				0.2331	−0.04813	0.00735	−0.01833	0.01680
n-Heptane	C_7H_{16}	0.147	0.140	0.132	0.126	0.117				0.2149	−0.02998	−0.00030	0.00103	−0.00120
n-Octane	C_8H_{18}	0.150	0.142	0.135	0.129	0.120	0.106			0.2150	−0.02839	−0.00072	0.00203	−0.00206
n-Nonane	C_9H_{20}	0.150	0.143	0.137	0.132	0.124	0.110	0.097		0.2096	−0.02727	0.00046	−0.00109	0.00095

D3.1. Table 9. (continued)

Substance	Formula	Temperature (°C)								Equation (4)				
		−50	−25	0	20	50	100	150	200	A	$10^2\,B$	$10^4\,C$	$10^7\,D$	$10^{10}\,E$
n-Decane	$C_{10}H_{22}$		0.144	0.138	0.133	0.126	0.113	0.101		0.2084	−0.02784	0.00139	−0.00298	0.00234
n-Undecane	$C_{11}H_{24}$		0.146	0.140	0.135	0.128	0.116	0.104		0.2053	−0.02477	0.00062	−0.00165	0.00147
n-Dodecane	$C_{12}H_{26}$			0.141	0.137	0.130	0.118	0.106	0.095	0.1994	−0.01715	−0.00259	0.00480	−0.00330
n-Tridecane	$C_{13}H_{28}$			0.143	0.138	0.131	0.120	0.109	0.097	0.2043	−0.02259	0.00008	−0.00031	0.00030
n-Tetradecane	$C_{14}H_{30}$				0.139	0.132	0.122	0.111	0.100	0.2023	−0.02148	0.00001	−0.00025	0.00029
n-Pentadecane	$C_{15}H_{32}$				0.142	0.136	0.125	0.114	0.103	0.2098	−0.02412	0.00040	0.00002	−0.00041
n-Hexadecane	$C_{16}H_{34}$				0.143	0.137	0.126	0.115	0.104	0.2106	−0.02430	0.00060	−0.00059	0.00017
n-Heptadecane	$C_{17}H_{36}$					0.138	0.127	0.116	0.104	0.2074	−0.02019	−0.00075	0.00127	−0.00078
n-Octadecane	$C_{18}H_{38}$					0.141	0.130	0.118	0.107	0.2078	−0.01754	−0.00153	0.00204	−0.00099
n-Nonadecane	$C_{19}H_{40}$					0.141	0.130	0.119	0.108	0.2078	−0.01771	−0.00152	0.00234	−0.00133
n-Eicosane	$C_{20}H_{42}$					0.146	0.134	0.123	0.112	0.2178	−0.02203	−0.00020	0.00043	−0.00030
Isoalkanes														
Isobutane	C_4H_{10}	0.123	0.114	0.105	0.097	0.086	0.068			0.2042	−0.03609	−0.00027	0.00057	−0.00042
2-Methyl butane	C_5H_{12}	0.133	0.125	0.118	0.111	0.102				0.2031	−0.02924	−0.00163	0.00417	−0.00379
2,2-Dimethyl propane	C_5H_{12}			0.105	0.097	0.087	0.071	0.055		0.2663	−0.08142	0.00768	0.00622	−0.01599
2-Methyl pentane	C_6H_{14}	0.131	0.124	0.117	0.111	0.103	0.089			0.1932	−0.02786	−0.00004	−0.00010	0.00028
3-Methyl pentane	C_6H_{14}	0.133	0.126	0.119	0.113	0.105	0.091			0.1950	−0.02734	−0.00055	0.00169	−0.00182
2,2-Dimethyl butane	C_6H_{14}	0.121	0.115	0.108	0.103					0.1797	−0.02584	0.00012	−0.00186	0.00334
2,3-Dimethyl butane	C_6H_{14}	0.123	0.117	0.111	0.106	0.099				0.1770	−0.02372	−0.00046	0.00156	−0.00197
Olefins														
Ethylene	C_2H_4	0.129	0.105	0.082						0.4145	−0.14789	0.00393	0.03157	−0.03936
Propylene	C_3H_6	0.131	0.121	0.111	0.102	0.090				0.2229	−0.04006	−0.00097	0.00325	−0.00390
1-Butene	C_4H_8	0.135	0.127							0.2141	−0.03645	0.00124	−0.00451	0.00593
1-Pentene	C_5H_{10}	0.139	0.131	0.124	0.117					0.2079	−0.03131	0.00028	−0.00052	0.00023
1-Hexene	C_6H_{12}	0.146	0.138	0.129	0.122	0.112				0.2227	−0.03417	−0.00015	0.00069	−0.00101
1-Heptene	C_7H_{14}	0.148	0.141	0.133	0.126	0.116	0.099	0.082	0.064	0.1390	0.05288	−0.03202	0.05190	−0.03149
1-Octene	C_8H_{16}	0.144	0.138	0.132	0.128	0.121	0.110			0.1934	−0.02199	−0.00014	−0.00009	0.00041
Propadiene	C_3H_4	0.140								0.2303	−0.04051	0.00039	−0.00356	0.00770
1,2-Butadiene	C_4H_6	0.143	0.134	0.126						0.2168	−0.02879	−0.00406	0.01300	−0.01536
1,3-Butadiene	C_4H_6	0.141	0.131							0.2111	−0.01862	−0.01043	0.02551	−0.02178
1,2-Pentadiene	C_5H_8	0.147	0.139	0.132	0.126					0.2110	−0.02792	−0.00072	0.00163	−0.00126
trans-1,3-Pentadiene	C_5H_8	0.144	0.136	0.129	0.123					0.2116	−0.03216	0.00080	0.00067	−0.00361

1,4-Pentadiene	C_5H_8	0.142	0.134	0.127	0.121					0.2084	−0.03030	0.00054	−0.00241	0.00371
2,3-Pentadiene	C_5H_8	0.148	0.140	0.133	0.127					0.2147	−0.03021	−0.00001	0.00055	−0.00114
Acetylene and derivatives														
Acetylene	C_2H_2	0.147	0.126							0.3031	−0.05158	−0.00609	−0.02848	0.08429
Propyne	C_3H_4	0.144	0.133							0.2345	−0.04068	0.00133	−0.01037	0.01914
2-Butyne	C_4H_6		0.141	0.133	0.126					0.2147	−0.02341	−0.00179	−0.00702	0.01726
1-Butyne	C_4H_6	0.145	0.136	0.127						0.2167	−0.02247	−0.00888	0.02718	−0.03070
Naphthenes														
Cyclopropane	C_3H_6	0.148								0.2399	−0.03803	−0.00119	−0.00420	0.01611
Cyclobutane	C_4H_8	0.147	0.138	0.130						0.2169	−0.02128	−0.01016	0.03434	−0.04204
Cyclopentane	C_5H_{10}	0.146	0.140	0.133	0.128					0.2060	−0.02668	0.00020	−0.00149	0.00235
Methyl cyclopentane	C_6H_{12}	0.137	0.131	0.125	0.120	0.112				0.1927	−0.02441	−0.00045	0.00165	−0.00210
Ethyl cyclopentane	C_7H_{14}	0.134	0.128	0.122	0.118	0.111	0.100			0.1812	−0.01850	−0.00234	0.00616	−0.00587
Propyl cyclopentane	C_8H_{16}	0.130	0.125	0.120	0.116	0.110	0.099			0.1763	−0.02054	−0.00007	0.00017	−0.00013
Butyl cyclopentane	C_9H_{18}	0.127	0.123	0.118	0.114	0.108	0.099	0.089		0.1705	−0.01968	0.00034	−0.00099	0.00099
Pentyl cyclopentane	$C_{10}H_{20}$			0.129	0.122	0.113	0.100	0.089	0.079	0.2731	−0.06961	0.00448	0.00963	−0.01333
Hexyl cyclopentane	$C_{11}H_{22}$			0.129	0.122	0.113	0.100	0.089	0.080	0.2744	−0.07215	0.00619	0.00514	−0.00925
Cyclohexane	C_6H_{12}				0.125	0.117				0.1771	−0.01050	−0.00114	−0.00967	0.01707
Methyl cyclohexane	C_7H_{14}			0.116	0.112	0.105	0.094			0.1656	−0.01293	−0.00155	−0.00297	0.00681
Ethyl cyclohexane	C_8H_{16}	0.132	0.127	0.122	0.118	0.112	0.101			0.1761	−0.01964	−0.00013	−0.00006	0.00034
Propyl cyclohexane	C_9H_{18}	0.128	0.124	0.119	0.115	0.110	0.101	0.091		0.1691	−0.01769	−0.00041	0.00082	−0.00057
Butyl cyclohexane	$C_{10}H_{20}$	0.126	0.121	0.117	0.114	0.108	0.100	0.091		0.1652	−0.01888	0.00085	−0.00187	0.00149
Pentyl cyclohexane	$C_{11}H_{22}$			0.129	0.122	0.113	0.100	0.089	0.080	0.2744	−0.07215	0.00619	0.00514	−0.00925
Hexyl cyclohexane	$C_{12}H_{24}$			0.132	0.125	0.117	0.104	0.093	0.084	0.2636	−0.06258	0.00398	0.00716	−0.00970
Cyclopentene	C_5H_8	0.156	0.149	0.142	0.136	0.128				0.2182	−0.02857	0.00046	−0.00108	0.00087
Cyclohexene	C_6H_{10}	0.151	0.145	0.138	0.133	0.125				0.2104	−0.02785	0.00105	−0.00259	0.00231
Aromatic compounds														
Benzene	C_6H_6				0.145	0.136	0.120			0.2318	−0.03081	0.00151	−0.00546	0.00564
Toluene	C_7H_8	0.151	0.144	0.138	0.134	0.126	0.114	0.102	0.090	0.2038	−0.02353	−0.00019	0.00010	0.00013
Ethyl benzene	C_8H_{10}	0.147	0.141	0.135	0.130	0.123	0.111			0.1996	−0.02319	−0.00039	0.00102	−0.00094
Propyl benzene	C_9H_{12}	0.143	0.138	0.133	0.129	0.123	0.113	0.103	0.093	0.1873	−0.02008	0.00008	−0.00010	0.00003
Butyl benzene	$C_{10}H_{14}$	0.142	0.137	0.132	0.128	0.122	0.112	0.102	0.092	0.1866	−0.01959	−0.00010	−0.00004	0.00020
Pentyl benzene	$C_{11}H_{16}$	0.142	0.137	0.133	0.129	0.124	0.114	0.105	0.096	0.1835	−0.01867	0.00010	−0.00022	0.00018
Hexyl benzene	$C_{12}H_{18}$	0.143	0.138	0.133	0.130	0.124	0.115	0.106	0.097	0.1851	−0.02027	0.00087	−0.00170	0.00121
o-Xylene	C_8H_{10}		0.143	0.137	0.133	0.126	0.114			0.1990	−0.02186	−0.00052	0.00107	−0.00085
m-Xylene	C_8H_{10}		0.142	0.136	0.131	0.124	0.113			0.1992	−0.02211	−0.00057	0.00095	−0.00053

D3.1. Table 9. (continued)

Substance	Formula	Temperature (°C)								Equation (4)				
		−50	−25	0	20	50	100	150	200	A	$10^2\ B$	$10^4\ C$	$10^7\ D$	$10^{10}\ E$
p-Xylene	C_8H_{10}				0.131	0.124	0.112			0.2036	−0.03045	0.00408	−0.00977	0.00825
1,2,3-Trimethyl benzene	C_9H_{12}		0.140	0.135	0.131	0.125	0.115	0.105		0.1888	−0.02000	0.00017	−0.00028	0.00011
1,2,4-Trimethyl benzene	C_9H_{12}		0.140	0.135	0.130	0.124	0.114	0.103		0.1917	−0.02076	−0.00001	−0.00022	0.00033
1,3,5-Trimethyl benzene	C_9H_{12}		0.146	0.141	0.136	0.130	0.119	0.107		0.2023	−0.02354	0.00053	−0.00077	0.00036
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$			0.134	0.130	0.125	0.115	0.105	0.096	0.1856	−0.01764	−0.00071	0.00132	−0.00092
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$			0.132	0.128	0.122	0.113	0.103		0.1814	−0.01489	−0.00202	0.00392	−0.00282
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$						0.123	0.114	0.105	0.1925	−0.02008	0.00040	0.00003	−0.00030
Pentamethyl benzene	$C_{11}H_{16}$						0.119	0.114	0.109	0.1494	−0.00447	−0.00139	0.00113	−0.00004
Hexamethyl benzene	$C_{12}H_{18}$								0.107	0.1125	−0.00097	−0.00005	−0.00001	0.00004
Styrene	C_8H_8		0.148	0.142	0.138	0.131	0.120			0.2002	−0.02031	−0.00044	0.00017	0.00043
Isopropyl benzene	C_9H_{12}	0.139	0.134	0.128	0.124	0.118	0.108			0.1856	−0.02089	−0.00008	0.00023	−0.00015
Biphenyl	$C_{12}H_{10}$						0.134	0.126	0.119	0.1919	−0.01611	0.00024	−0.00026	0.00010
Diphenyl methane	$C_{13}H_{12}$					0.133	0.127	0.120	0.114	0.1751	−0.01287	0.00004	−0.00023	0.00023
Triphenyl methane	$C_{19}H_{16}$						0.124	0.116	0.108	0.1855	−0.01942	0.00126	−0.00164	0.00079
Tetraphenyl methane	$C_{25}H_{20}$									0.1758	−0.00352	−0.00044	−0.00217	0.00184
Naphthalene	$C_{10}H_8$						0.133	0.128	0.123	0.1684	−0.00779	−0.00075	0.00110	−0.00059
1-Methylnaphthalene	$C_{11}H_{10}$		0.153	0.149	0.145	0.140	0.131	0.122	0.113	0.1962	−0.01643	−0.00061	0.00105	−0.00067
2-Methylnaphthalene	$C_{11}H_{10}$					0.137	0.127	0.118	0.109	0.1958	−0.01847	0.00016	−0.00046	0.00040
1-Ethylnaphthalene	$C_{12}H_{12}$			0.144	0.140	0.135	0.126	0.118	0.109	0.1905	−0.01568	−0.00093	0.00191	−0.00136
2-Ethylnaphthalene	$C_{12}H_{12}$			0.142	0.138	0.133	0.124	0.116	0.107	0.1903	−0.01802	0.00014	−0.00010	−0.00002
Alcohols														
Methanol	CH_4O	0.221	0.214	0.207	0.201	0.193				0.2803	−0.02234	−0.00359	0.00975	−0.00974
Ethanol	C_2H_6O	0.188	0.181	0.175	0.169	0.162				0.2467	−0.02636			
1-Propanol	C_3H_8O	0.172	0.167	0.161	0.157	0.151				0.2219	−0.02331	0.00067	−0.00097	0.00039
1-Butanol	$C_4H_{10}O$	0.168	0.163	0.158	0.154	0.148	0.138			0.2139	−0.02011	−0.00044	0.00178	−0.00215
1-Pentanol	$C_5H_{12}O$			0.157	0.154	0.149				0.1967	−0.01311	−0.00042	−0.00120	0.00264
1-Hexanol	$C_6H_{14}O$		0.165	0.159	0.155	0.148	0.137	0.126	0.115	0.2200	−0.02279	0.00031	−0.00052	0.00032
1-Heptanol	$C_7H_{16}O$		0.168	0.162	0.158	0.151	0.140	0.128	0.117	0.2241	−0.02268	−0.00001	0.00008	−0.00008
1-Octanol	$C_8H_{18}O$			0.166	0.161	0.154	0.142	0.130	0.118	0.2332	−0.02571	0.00060	−0.00096	0.00056
Isopropanol	C_3H_8O	0.152	0.146	0.141	0.136	0.129	0.118			0.2028	−0.02238	−0.00031	0.00083	−0.00069
2-Methyl-1-propanol	$C_4H_{10}O$	0.145	0.141	0.136	0.133	0.127	0.118			0.1845	−0.01726	−0.00022	0.00028	−0.00004
3-Methyl-1-butanol	$C_5H_{12}O$	0.161	0.154	0.148	0.142	0.134	0.12	0.106		0.2225	−0.02752	0.00005	−0.00014	0.00013

Ethylene glycol	$C_2H_6O_2$			0.249	0.253	0.257	0.259	0.254		0.1125	0.06626	−0.00088	−0.02300	0.01597
1,3-Propylene glycol	$C_3H_8O_2$		0.212	0.218	0.222	0.226	0.227	0.222	0.210	0.0867	0.06667	−0.00281	−0.01797	0.01228
Glycerol	$C_3H_8O_3$				0.291	0.295	0.300	0.306	0.312	0.2562	0.01190	0.00023	−0.00105	0.00102
Cyclohexanol	$C_6H_{12}O$					0.131	0.125	0.118	0.112	0.1708	−0.01180	−0.00028	0.00044	−0.00026
Benzyl alcohol	C_7H_8O			0.162	0.161	0.159	0.155	0.152	0.149	0.1798	−0.00640	−0.00004	−0.00007	0.00014
Phenols														
o-Cresol	C_7H_8O					0.150	0.143	0.137		0.1969	−0.01634	0.00043	0.00088	−0.00164
m-Cresol	C_7H_8O				0.150	0.147	0.141	0.135	0.130	0.1813	−0.01047	−0.00004	−0.00027	0.00038
p-Cresol	C_7H_8O					0.141	0.135	0.129	0.123	0.1914	−0.02103	0.00224	−0.00167	−0.00031
Phenol	C_6H_6O					0.156	0.151	0.146		0.1828	−0.00700	−0.00007	−0.00181	0.00243
Carboxylic acids														
Formic acid	CH_2O_2				0.270	0.267	0.262			0.2971	−0.00743	−0.00030	−0.00196	0.00347
Acetic acid	$C_2H_4O_2$				0.160	0.155	0.146			0.1726	0.01538	−0.00818	0.00287	0.00746
Propionic acid	$C_3H_6O_2$			0.151	0.147	0.142	0.134	0.126	0.118	0.1954	−0.01641			
Butyric acid	$C_4H_8O_2$			0.151	0.147	0.142	0.134	0.126	0.117	0.1967	−0.01681			
Valeric acid	$C_5H_{10}O_2$		0.145	0.139	0.134	0.126	0.114	0.102		0.2114	−0.02925	0.00156	−0.00236	0.00120
Caproic acid	$C_6H_{12}O_2$			0.146	0.143	0.138	0.131	0.124	0.116	0.1906	−0.01948	0.00172	−0.00261	0.00146
Acetic anhydride	$C_4H_6O_3$	0.182	0.176	0.170	0.165	0.158	0.146			0.2363	−0.02436	0.00013	−0.00047	0.00054
Propionic anhydride	$C_6H_{10}O_3$		0.156	0.150	0.145	0.137	0.125	0.112		0.2206	−0.02771	0.00099	−0.00141	0.00058
Chloroacetic acid	$C_2H_3ClO_2$						0.159	0.146		0.2322	−0.01111	−0.00091	−0.00730	0.00999
Dichloroacetic acid	$C_2H_2Cl_2O_2$				0.188	0.180	0.166	0.151		0.2727	−0.02907	0.00011	−0.00001	−0.00009
Trichloroacetic acid	$C_2HCl_3O_2$						0.181	0.165		0.2848	−0.02372	−0.00046	−0.00339	0.00463
Ketones														
Ketene	C_2H_2O	0.228								0.3761	−0.03390	−0.03604	0.14382	−0.21167
Acetone	C_3H_6O	0.193	0.182	0.171	0.163	0.150				0.2871	−0.04233	0.00019	−0.00148	0.00228
Methyl ethyl ketone	C_4H_8O	0.164	0.158	0.151	0.146	0.139				0.2215	−0.02706	0.00061	−0.00008	−0.00132
Diethyl ketone	$C_5H_{10}O$		0.156	0.150	0.145	0.138	0.126			0.2044	−0.01212	−0.00441	0.00636	−0.00254
Dipropyl ketone	$C_7H_{14}O$		0.150	0.144	0.140	0.133	0.121	0.110	0.098	0.2075	−0.02376	0.00032	−0.00052	0.00030
Acetophenone	C_8H_8O				0.148	0.143	0.134	0.126	0.117	0.1965	−0.01643	0.00018	−0.00114	0.00127
Benzophenone	$C_{13}H_{10}O$					0.186	0.175	0.163	0.152	0.2610	−0.02455	0.00066	−0.00093	0.00049
Ethers														
Dimethyl ether	C_2H_6O	0.186	0.172	0.158	0.146					0.3129	−0.05870	0.00170	−0.00532	0.00607
Diethyl ether	$C_4H_{10}O$	0.159	0.149	0.138	0.130	0.118	0.098	0.077		0.2499	−0.04131	0.00036	−0.00086	0.00073
Dipropyl ether	$C_6H_{14}O$	0.149	0.141	0.134	0.128	0.119	0.105			0.2131	−0.02833	−0.00043	0.00088	−0.00065
Methyl propyl ether	$C_4H_{10}O$	0.164	0.155	0.145	0.138	0.126				0.2475	−0.03664	−0.00060	0.00132	−0.00100
Ethyl propyl ether	$C_5H_{12}O$	0.154	0.145	0.137	0.131	0.121	0.104			0.2276	−0.03363	0.00036	−0.00079	0.00060

D3.1. Table 9. (continued)

Substance	Formula	Temperature (°C)								Equation (4)				
		−50	−25	0	20	50	100	150	200	A	$10^2\,B$	$10^4\,C$	$10^7\,D$	$10^{10}\,E$
Ethylene oxide	C_2H_4O	0.181	0.171	0.161						0.2529	−0.00990	−0.01984	0.05755	−0.06175
Furane	C_4H_4O	0.150	0.142	0.134	0.128					0.2058	−0.01538	−0.00537	0.00236	0.00981
1,4-Dioxane	$C_4H_8O_2$				0.161	0.147	0.123			0.2815	−0.03069	−0.00435	0.00160	0.00401
Aldehydes														
Formaldehyde	CH_2O	0.228								0.3834	−0.07422	0.00084	0.01156	−0.02638
Acetaldehyde	C_2H_4O	0.214	0.203	0.192	0.183					0.2979	−0.01871	−0.01741	0.05316	−0.05982
Paraldehyde	$C_6H_{12}O_3$					0.142	0.135			0.1820	−0.00949	−0.00080	−0.00103	0.00253
Furfural	$C_5H_4O_2$				0.173	0.167	0.157			0.1911	0.00303	−0.00101	−0.01267	0.01783
Benzaldehyde	C_7H_6O	0.166	0.162	0.157	0.153	0.148	0.139	0.130	0.121	0.2080	−0.01952	0.00048	−0.00069	0.00035
Salicylaldehyde	$C_7H_6O_2$				0.168	0.160	0.147	0.134		0.2425	−0.02472	−0.00062	0.00149	−0.00122
Esters														
Methyl formate	$C_2H_4O_2$	0.220	0.208	0.197	0.187	0.173	0.150			0.3250	−0.04714	0.00001	0.00041	−0.00076
Ethyl formate	$C_3H_6O_2$	0.185	0.177	0.169	0.162	0.152	0.136	0.119		0.2619	−0.03750	0.00233	−0.00521	0.00426
Propyl formate	$C_4H_8O_2$	0.166	0.159	0.153	0.147	0.139	0.126	0.113	0.100	0.2246	−0.02626	−0.00010	0.00026	−0.00023
Methyl acetate	$C_3H_6O_2$	0.185	0.174	0.164	0.155	0.143	0.122			0.2795	−0.04392	0.00097	−0.00169	0.00097
Ethyl acetate	$C_4H_8O_2$	0.171	0.162	0.153	0.146	0.135				0.2487	−0.03472	0.00014	−0.00183	0.00289
Propyl acetate	$C_5H_{10}O_2$	0.164	0.156	0.149	0.142	0.133	0.118	0.102		0.2323	−0.03003	−0.00030	0.00028	0.00007
Methyl propionate	$C_4H_8O_2$	0.165	0.159	0.152	0.147	0.139	0.125	0.112	0.098	0.2242	−0.02552	−0.00054	0.00096	−0.00060
Ethyl propionate	$C_5H_{10}O_2$	0.158	0.151	0.145	0.140	0.132	0.120	0.107	0.095	0.2140	−0.02537	0.00005	0.00001	−0.00008
Propyl propionate	$C_6H_{12}O_2$	0.157	0.150	0.143	0.138	0.129	0.115	0.101		0.2208	−0.02909	0.00039	−0.00048	0.00011
Methyl butyrate	$C_5H_{10}O_2$	0.160	0.153	0.147	0.142	0.134	0.121	0.108	0.095	0.2173	−0.02580	0.0	−0.00012	0.00017
Ethyl butyrate	$C_6H_{12}O_2$	0.155	0.149	0.142	0.137	0.130	0.117	0.105		0.2097	−0.02404	−0.00036	0.00064	−0.00039
Methyl benzoate	$C_8H_8O_2$			0.160	0.155	0.149	0.137	0.125	0.114	0.2246	−0.02449	0.00055	−0.00106	0.00074
Ethyl benzoate	$C_9H_{10}O_2$		0.155	0.150	0.145	0.139	0.128	0.118	0.107	0.2074	−0.02103	−0.00005	0.00001	0.00004
Methyl salicylate	$C_8H_8O_3$			0.149	0.145	0.138	0.128	0.118	0.107	0.1937	−0.00824	−0.00491	0.00838	−0.00525

Amines														
Methyl amine	CH_5N	0.224	0.217	0.210						0.3130	−0.03506	−0.00970	0.04159	−0.03482
Ethyl amine	C_2H_7N	0.204	0.197	0.191	0.187					0.2923	−0.04639	0.00066	0.01270	−0.00936
Propyl amine	C_3H_9N	0.188	0.182	0.177	0.173	0.168				0.2597	−0.03808	0.00174	0.00537	−0.00462
n-butyl amine	$C_4H_{11}N$		0.171	0.166	0.162	0.157				0.2685	−0.04797	0.00062	0.01465	−0.01150
Dimethyl amine	C_2H_7N	0.170	0.162	0.153	0.146	0.136	0.119			0.2444	−0.03272	−0.00039	0.00057	−0.00027
Trimethyl amine	C_3H_9N	0.152	0.143	0.133						0.2257	−0.01529	−0.01592	0.04807	−0.05383
Diethyl amine	$C_6H_{15}N$		0.150	0.142	0.136	0.127	0.115	0.104		0.2496	−0.04387	−0.00016	0.00792	−0.00526
Triethyl amine	$C_6H_{15}N$	0.137	0.131	0.125	0.120	0.113	0.100	0.088	0.076	0.1914	−0.02402	−0.00020	0.00032	−0.00016
Piperidine	$C_5H_{11}N$			0.187	0.181	0.171	0.154			0.2913	−0.05011	0.00823	−0.01803	0.01475
Pyridine	C_6H_7N		0.177	0.169	0.164	0.155	0.141	0.127	0.112	0.2477	−0.02862	0.00001	−0.00003	0.00003
Aniline	C_6H_7N			0.178	0.173	0.167	0.156	0.145	0.135	0.2365	−0.02199	0.00023	−0.00036	0.00021
N-methyl aniline	C_7H_9N	0.172	0.167	0.162	0.159	0.153	0.144	0.135	0.125	0.2137	−0.01923	0.00025	−0.00040	0.00024
N,N-dimethyl aniline	$C_8H_{11}N$				0.143	0.138	0.129	0.121		0.1921	−0.01666	−0.00006	−0.00004	0.00012
N,N-diethyl aniline	$C_{10}H_{15}N$		0.151	0.146	0.142	0.136	0.126	0.116	0.105	0.2028	−0.02163	0.00050	−0.00087	0.00057
Phenylhydrazine	$C_6H_8N_2N_2$				0.141	0.135	0.126	0.117	0.108	0.1942	−0.01858	0.00016	−0.00028	0.00020
Diphenyl amine	$C_{12}H_{11}N$						0.127	0.119	0.110	0.1832	−0.01130	−0.00178	0.00261	−0.00142
Nitriles														
Acetonitrile	C_2H_3N		0.208	0.198	0.190	0.178				0.3109	−0.04357	0.00094	−0.00022	−0.00134
Propionitrile	C_3H_5N	0.192	0.184	0.176	0.169	0.159				0.2660	−0.03337	0.00048	−0.00181	0.00209
Butyronitrile	C_4H_7N	0.191	0.183	0.175	0.169	0.160	0.144			0.2602	−0.03188	0.00057	−0.00161	0.00164
Benzonitrile	C_7H_5N			0.154	0.150	0.143	0.132	0.121		0.2152	−0.02440	0.00126	−0.00244	0.00175
Amides														
Formamide	CH_3NO				0.353	0.350	0.345	0.340	0.334	0.3852	−0.01102	0.00005	0.00008	−0.00017
Nitroderivates														
Nitromethane	CH_3NO_2		0.227	0.217	0.209	0.197	0.176			0.3307	−0.04243	−0.00006	0.00219	−0.00330
Nitrobenzene	$C_6H_5NO_2$				0.149	0.145	0.138			0.1793	−0.00759	−0.00088	−0.00120	0.00295
o-Nitrotoluene	$C_7H_7NO_2$			0.146	0.142	0.136	0.126	0.116	0.106	0.2013	−0.02041	0.00018	−0.00043	0.00032
m-Nitrotoluene	$C_7H_7NO_2$				0.141	0.135	0.125	0.116	0.106	0.1961	−0.01788	−0.00049	0.00064	−0.00030
p-Nitrotoluene	$C_7H_7NO_2$						0.126	0.117	0.107	0.1968	−0.01682	−0.00101	0.00159	−0.00093

D3.1. Table 10. Thermal conductivity of gases in W/mK at low pressures

Substance	Formula	Temperature (°C)								Equation (5)				
		−50	0	25	100	200	300	400	500	10^3 *A*	10^3 *B*	10^6 *C*	10^9 *D*	10^{12} *E*
Elements														
Xenon	Xe	0.0043	0.0052	0.0056	0.0069	0.0086	0.0102	0.0117	0.0132	−0.006	0.020	−0.003680		
Krypton	Kr	0.0073	0.0088	0.0095	0.0115	0.0140	0.0163	0.0184	0.0204	−0.389	0.039	−0.021190	0.008780	−0.001520
Argon	Ar		0.0166	0.0177	0.0209	0.0249	0.0288	0.0326	0.0362	4.303	0.047	−0.007780		
Neon	Ne	0.0393	0.0459	0.0490	0.0578	0.0682	0.0774	0.0858	0.0936	2.778	0.194	−0.155500	0.086380	−0.017700
Helium	He	0.1263	0.1446	0.1536	0.1793	0.2116	0.2420	0.2708	0.2983	34.000	0.457	−0.214890	0.100710	−0.019140
Air		0.0204	0.0244	0.0263	0.0317	0.0383	0.0444	0.0502	0.0557	−0.908	0.112	−0.084333	0.056964	−0.015631
Hydrogen	H_2	0.1429	0.1685	0.1807	0.2149	0.2566	0.2952	0.3319	0.3678	0.651	0.767	−0.687050	0.506510	−0.138540
Nitrogen	N_2	0.0198	0.0237	0.0256	0.0309	0.0375	0.0437	0.0495	0.0551	−0.133	0.101	−0.060650	0.033610	−0.007100
Oxygen	O_2	0.0201	0.0244	0.0264	0.0324	0.0398	0.0468	0.0534	0.0597	−1.285	0.107	−0.052630	0.025680	−0.005040
Sulfur	S								0.0145	1.596	0.016	0.001450		
Fluorine	F_2	0.0195	0.0237	0.0258	0.0318	0.0395	0.0469	0.0539	0.0605	−0.246	0.093	−0.018470		
Chlorine	Cl_2	0.0063	0.0081	0.0089	0.0115	0.0147	0.0179	0.0210	0.0239	−1.867	0.038	−0.006090		
Bromine	Br_2				0.0061	0.0089				5.455	−0.018	0.054230		
Iodine	I_2					0.0052	0.0063	0.0074	0.0085	−0.014	0.011	0.000020		
Anorganic compounds														
Hydrogen fluoride	HF	0.0167	0.0198	0.0214	0.0263	0.0329	0.0396	0.0464	0.0534	2.921	0.060	0.006940		
Hydrogen chloride	HCl	0.0112	0.0134	0.0146	0.0179	0.0224	0.0269	0.0314	0.0359	1.233	0.045	0.000370		
Hydrogen bromide	HBr	0.0061	0.0077	0.0086	0.0110	0.0142	0.0173			−1.740	0.036	−0.004870		
Hydrogen iodide	HI		0.0056	0.0061	0.0077	0.0098	0.0118	0.0138	0.0157	−0.308	0.022	−0.001840		
Hydrogen cyanide	HCN		0.0098	0.0118	0.0178	0.0259	0.0338	0.0418		−12.121	0.080	−0.000500		
Water	H_2O			0.0185	0.0239	0.0329	0.0433	0.0547	0.0669	13.918	−0.047	0.258066	−0.183149	0.055092
Hydrogen sulfide	H_2S	0.0083	0.0126	0.0144	0.0190	0.0247	0.0308			−37.786	0.366	−0.980220	1.341110	−0.662840
Ammonia	NH_3		0.0221	0.0251	0.0344	0.0476	0.0618	0.0770	0.0931	−6.678	0.092	0.047670		
Nitric oxide	NO	0.0196	0.0236	0.0255	0.0312	0.0383	0.0449	0.0509		0.144	0.093	−0.02601		
Nitrogen dioxide	NO_2				0.0280					66.085	−0.479	1.011240		
Nitrous oxide	N_2O	0.0119	0.0157	0.0176	0.0234	0.0310	0.0388	0.0465	0.0543	−5.049	0.076	0.001460		
Dinitrogentetroxide	N_2O_4													
Cyanogen	C_2N_2		0.0144	0.0160	0.0211	0.0280	0.0351	0.0424	0.0499	−2.939	0.061	0.009930		
Phosphorus trichloride	PCl_3	0.0053	0.0068	0.0075	0.0098	0.0127	0.0156	0.0183	0.0209	−1.274	0.028	0.008226	−0.013677	0.005121
Cyanogen chloride	ClCN			0.0094	0.0122	0.0160	0.0196	0.0231	0.0265	−2.531	0.042	−0.005290		
Silane	SiH_4	0.0157	0.0204	0.0228	0.0305	0.0416	0.0534	0.0659	0.0788	−1.601	0.062	0.074888	−0.029302	0.003487
Tetrachlorosilane	$SiCl_4$	0.0043	0.0057	0.0065	0.0086	0.0115	0.0144	0.0173	0.0202	−2.173	0.029			

Carbon monoxide	CO	0.0193	0.0231	0.0249	0.0302	0.0366	0.0426	0.0481	0.0534	−0.783	0.103	−0.067590	0.039450	−0.009470
Carbon dioxide	CO_2		0.0145	0.0165	0.0225	0.0306	0.0386	0.0463	0.0536	−3.882	0.053	0.071460	−0.070310	0.018090
Carbon suboxide	C_3O_2	0.0077	0.0110	0.0127	0.0183	0.0260	0.0335	0.0405	0.0472	1.362	−0.017	0.267780	−0.322540	0.133290
Carbonyl sulfide	COS	0.0095	0.0125	0.0140	0.0184	0.0242	0.0300	0.0356	0.0412	−4.089	0.062	−0.004270		
Phosgene	CCl_2O		0.0076	0.0088	0.0125	0.0179	0.0238	0.0301	0.0368	−3.777	0.036	0.021900		
Carbon disulfide	CS_2		0.0077	0.0087	0.0118	0.0159	0.0200	0.0241	0.0282	−3.468	0.041	0.000210		
Sulfur dioxide	SO_2		0.0084	0.0095	0.0131	0.0183	0.0238	0.0292	0.0343	0.358	0.013	0.069520	−0.032070	−0.008300
Sulfur trioxide	SO_3				0.0172	0.0231	0.0287	0.0340	0.0391	−7.361	0.071	−0.014220		
Sulfuryl chloride	Cl_2SO_2				0.0119	0.0159	0.0199	0.0238	0.0276	−3.541	0.043	−0.002860		
Sulfur hexafluoride	SF_6		0.0118	0.0135	0.0184	0.0243	0.0296	0.0343	0.0384	−9.510	0.087	−0.031860		
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S		0.0116	0.0137	0.0199	0.0284	0.0371	0.0461	0.0554	−9.622	0.074	0.012580		
Ethyl mercaptan	C_2H_6S				0.0202	0.0289	0.0381	0.0478	0.0579	−8.457	0.068	0.022700		
Dimethyl sulfide	C_2H_6S				0.0204	0.0293	0.0386	0.0484	0.0587	−8.509	0.069	0.023630		
Diethyl sulfide	$C_4H_{10}S$				0.0180	0.0270	0.0365	0.0463	0.0566	−12.116	0.073	0.020380		
Thiophene	C_4H_4S				0.0163	0.0239	0.0320	0.0406	0.0496	−8.013	0.057	0.023220		
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	0.0099	0.0129	0.0144	0.0190	0.0250	0.0310	0.0369	0.0429	−3.680	0.061	−0.001100		
Difluoromethane (R32)	CH_2F_2	0.0073	0.0098	0.0111	0.0148	0.0199	0.0251	0.0304	0.0358	−3.440	0.047	0.004350		
Trifluoromethane (R23)	CHF_3	0.0088	0.0120	0.0136	0.0189	0.0263	0.0337	0.0408	0.0475	−0.732	0.018	0.136890	−0.135880	0.041920
Tetrafluoromethane (R14)	CF_4	0.0099	0.0138	0.0158	0.0219	0.0302	0.0382	0.0456	0.0524	−2.200	0.026	0.167240	−0.199700	0.074660
Methyl chloride	CH_3Cl	0.0064	0.0092	0.0107	0.0159	0.0241	0.0338	0.0450		−1.448	0.018	0.075410		
Methylene chloride	CH_2Cl_2			0.0072	0.0108	0.0159	0.0214	0.0274	0.0337	−4.536	0.033	0.021050		
Chloroform	$CHCl_3$		0.0060	0.0066	0.0083	0.0106	0.0130	0.0153	0.0177	−0.216	0.022	0.001040		
Carbon tetrachloride	CCl_4		0.0059	0.0067	0.0088	0.0118	0.0147	0.0175	0.0204	−2.101	0.030	−0.000530		
Bromomethane	CH_3Br		0.0066	0.0077	0.0108	0.0152	0.0198	0.0247	0.0297	−3.766	0.035	0.010400		
Dibromomethane	CH_2Br_2				0.0069	0.0104	0.0142	0.0182	0.0226	−3.217	0.021	0.015550		
Tribromomethane	$CHBr_3$					0.0083	0.0114	0.0149	0.0187	−1.531	0.012	0.017770		
Tetrabromomethane	CBr_4	0.0081	0.0097	0.0105	0.0132	0.0168	0.0205	0.0240	0.0273	2.432	0.018	0.041190	−0.032120	0.004000
Chlorodifluoromethane (R22)	$CHClF_2$		0.0094	0.0109	0.0154	0.0212	0.0269	0.0324	0.0377	−8.104	0.066	−0.009410		
Dichlorofluoromethane (R21)	$CHCl_2F$			0.0086	0.0125	0.0177	0.0227	0.0275	0.0323	−7.857	0.057	−0.006660		
Chlorotrifluoromethane (R13)	$CClF_3$	0.0076	0.0106	0.0121	0.0169	0.0232	0.0293	0.0348	0.0397	−1.734	0.020	0.132510	−0.160810	0.059510
Dichlorodifluoromethane (R12)	CCl_2F_2		0.0085	0.0097	0.0135	0.0193	0.0257	0.0328		−1.873	0.029	0.034090		
Trichlorofluoromethane (R11)	CCl_3F		0.0069	0.0079	0.0108	0.0150				−2.430	0.031	0.012940		
Ethyl fluoride (R161)	C_2H_5F		0.0121	0.0140	0.0196	0.0275	0.0359	0.0446	0.0538	−6.157	0.061	0.021240		
Ethyl chloride	C_2H_5Cl		0.0095	0.0112	0.0167	0.0247	0.0335	0.0431	0.0535	−6.153	0.046	0.039790		
Ethyl bromide	C_2H_5Br				0.0135	0.0192	0.0252	0.0314	0.0379	−5.547	0.046	0.012890		

D3.1. Table 10. (continued)

Substance	Formula	Temperature (°C)								Equation (5)				
		−50	0	25	100	200	300	400	500	10^3 *A*	10^3 *B*	10^6 *C*	10^9 *D*	10^{12} *E*
1,1-Dichloroethane	$C_2H_4Cl_2$				0.0141	0.0212	0.0290	0.0376	0.0470	−6.137	0.041	0.036390		
1,2-Dichloroethane	$C_2H_4Cl_2$				0.0127	0.0192	0.0266	0.0346	0.0433	0.513	−0.004	0.125349	−0.085225	0.028133
1,2-Dibromoethane	$C_2H_4Br_2$					0.0136	0.0178	0.0222	0.0267	−4.774	0.036	0.006440		
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$		0.0112	0.0128	0.0181	0.0260	0.0346	0.0435	0.0524	0.069	0.014	0.111220	−0.053330	−0.001330
1,1,1-Trichloroethane	$C_2H_3Cl_3$				0.0125	0.0191	0.0265	0.0345	0.0433	−5.829	0.035	0.036400		
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$					0.0144	0.0200	0.0264	0.0334	−2.397	0.019	0.035930		
Pentachloroethane	C_2HCl_5					0.0134	0.0188	0.0248	0.0316	−2.200	0.016	0.035390		
Hexachloroethane	C_2Cl_6					0.0122	0.0172	0.0228	0.0290	−2.033	0.014	0.033490		
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$				0.0096	0.0149	0.0207	0.0271	0.0341	−4.773	0.028	0.029320		
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		0.0076	0.0089	0.0125	0.0171	0.0216	0.0259	0.0300	−6.397	0.054	−0.008760		
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$			0.0103	0.0143	0.0196	0.0247	0.0296	0.0343	−6.889	0.060	−0.008890		
1-Chloropropane	C_3H_7Cl				0.0162	0.0244	0.0334	0.0433	0.0540	−7.089	0.047	0.041460		
1-Chlorobutane	C_4H_9Cl		0.0084	0.0100	0.0153	0.0232	0.0322	0.0421	0.0530	−5.369	0.037	0.050150		
1-Chloropentane	$C_5H_{11}Cl$				0.0150	0.0232	0.0324	0.0427	0.0541	−5.738	0.035	0.054510		
Chlorotrifluoroethene	C_2ClF_3		0.0102	0.0117	0.0170	0.0250	0.0338	0.0432	0.0528	0.014	0.009	0.116740	−0.051520	−0.000700
Vinyl chloride	C_2H_3Cl		0.0104	0.0121	0.0173	0.0252	0.0341	0.0440	0.0549	−3.095	0.036	0.050930		
1,1-Dichloroethene	$C_2H_2Cl_2$		0.0068	0.0079	0.0117	0.0171	0.0232	0.0299	0.0371	−3.531	0.030	0.029680		
Trichloroethene	C_2HCl_3			0.0079	0.0107	0.0144	0.0180	0.0217	0.0254	−3.226	0.037	−0.000650		
Tetrachloroethene	C_2Cl_4					0.0122	0.0152	0.0182	0.0211	−2.838	0.033	−0.002620		
Fluorobenzene	C_6H_5F				0.0167	0.0256	0.0358			−5.050	0.034	0.065160		
Chlorobenzene	C_6H_5Cl					0.0217	0.0307	0.0407	0.0516	−8.355	0.041	0.046620		
Bromobenzene	C_6H_5Br					0.0154	0.0210	0.0266	0.0323	−10.831	0.055	0.000840		
Iodobenzene	C_6H_5I					0.0132	0.0182	0.0233	0.0284	−9.845	0.047	0.002660		
m-Chlorotoluene	C_7H_7Cl					0.0124	0.0171	0.0224	0.0283	−2.219	0.017	0.028710		
Benzyl chloride	C_7H_7Cl					0.0159	0.0217	0.0275	0.0333	−11.207	0.057	0.001190		
***n*-Alkanes**														
Methane	CH_4	0.0241	0.0305	0.0340	0.0453	0.0619	0.0797	0.0985	0.1184	8.154	0.008	0.351530	−0.338650	0.140920
Ethane	C_2H_6	0.0127	0.0184	0.0215	0.0320	0.0481	0.0661	0.0857	0.1066	−0.907	0.009	0.267380	−0.165560	0.048330
Propane	C_3H_8		0.0154	0.0181	0.0272	0.0411	0.0571	0.0750	0.0950	−6.656	0.053	0.101810		
n-Butane	C_4H_{10}		0.0134	0.0162	0.0253	0.0389	0.0543	0.0715	0.0905	−9.954	0.061	0.088710		
n-Pentane	C_5H_{12}		0.0128	0.0150	0.0224	0.0340	0.0475	0.0630	0.0806	−3.267	0.032	0.099040		
n-Hexane	C_6H_{14}				0.0203	0.0311	0.0439	0.0587	0.0753	−3.277	0.027	0.096500		
n-Heptane	C_7H_{16}				0.0190	0.0297	0.0422	0.0564	0.0724	−5.442	0.033	0.088020		

n-Octane	C_8H_{18}				0.0179	0.0278	0.0396	0.0532	0.0687	−2.456	0.020	0.093390		
n-Nonane	C_9H_{20}					0.0262	0.0374	0.0505	0.0653	−2.317	0.017	0.090970		
n-Decane	$C_{10}H_{22}$					0.0242	0.0351	0.0479	0.0625	−1.409	0.009	0.095140		
n-Undecane	$C_{11}H_{24}$					0.0229	0.0338	0.0462	0.0603	−6.240	0.023	0.081070		
n-Dodecane	$C_{12}H_{26}$						0.0323	0.0441	0.0575	−7.217	0.027	0.073790		
n-Tridecane	$C_{13}H_{28}$						0.0308	0.0422	0.0551	−7.043	0.025	0.071680		
n-Tetradecane	$C_{14}H_{30}$						0.0296	0.0403	0.0526	−1.684	0.010	0.077940		
n-Pentadecane	$C_{15}H_{32}$						0.0281	0.0388	0.0508	−6.608	0.022	0.068200		
n-Hexadecane	$C_{16}H_{34}$						0.0269	0.0373	0.0490	−6.286	0.019	0.067930		
n-Heptadecane	$C_{17}H_{36}$							0.0339	0.0451	1.219	−0.007	0.081760		
n-Octadecane	$C_{18}H_{38}$							0.0327	0.0435	1.394	−0.007	0.079670		
n-Nonadecane	$C_{19}H_{40}$							0.0315	0.0421	−1.657	0.000	0.072870		
n-Eicosane	$C_{20}H_{42}$							0.0307	0.0409	1.519	−0.008	0.075880		
Isoalkanes														
Isobutane	C_4H_{10}		0.0139	0.0164	0.0251	0.0383	0.0528	0.0679	0.0832	1.433	−0.022	0.305790	−0.226490	0.058610
2-Methyl butane	C_5H_{12}		0.0120	0.0144	0.0227	0.0353	0.0491	0.0635	0.0782	0.912	−0.029	0.319870	−0.259160	0.079360
2,2-Dimethyl propane	C_5H_{12}		0.0120	0.0149	0.0241	0.0372	0.0512	0.0660	0.0817	−16.839	0.093	0.044110		
2-Methyl pentane	C_6H_{14}				0.0206	0.0329	0.0455	0.0585	0.0719	−22.140	0.108	0.017500		
3-Methyl pentane	C_6H_{14}				0.0205	0.0328	0.0455	0.0586	0.0721	−22.148	0.107	0.019360		
2,2-Dimethyl butane	C_6H_{14}				0.0216	0.0342	0.0474	0.0610	0.0752	−20.993	0.105	0.025680		
2,3-Dimethyl butane	C_6H_{14}				0.0207	0.0332	0.0462	0.0595	0.0733	−22.295	0.107	0.020880		
Olefins														
Ethylene	C_2H_4	0.0130	0.0180	0.0208	0.0303	0.0454	0.0628	0.0823	0.1036	3.246	−0.010	0.271040	−0.156820	0.050860
Propylene	C_3H_6		0.0151	0.0178	0.0263	0.0389	0.0529	0.0685	0.0855	−7.786	0.064	0.073320		
1-Butene	C_4H_8		0.0130	0.0152	0.0225	0.0341	0.0478	0.0636	0.0815	−2.290	0.027	0.104930		
1-Pentene	C_5H_{10}				0.0208	0.0319	0.0449	0.0599	0.0768	−2.635	0.026	0.099680		
1-Hexene	C_6H_{12}				0.0203	0.0315	0.0441	0.0581	0.0735	−8.882	0.052	0.070750		
1-Heptene	C_7H_{14}	0.0052	0.0097	0.0120	0.0192	0.0296	0.0412	0.0542	0.0687	−15.924	0.106	−0.085770	0.168444	−0.067405
1-Octene	C_8H_{16}					0.0279	0.0395	0.0525	0.0669	−7.408	0.041	0.071630		
Propadiene	C_3H_4		0.0130	0.0155	0.0234	0.0340	0.0450	0.0562	0.0677	−14.020	0.095	0.013700		
1,2-Butadiene	C_4H_6			0.0129	0.0205	0.0309	0.0417	0.0529	0.0644	−15.212	0.089	0.017970		
1,3-Butadiene	C_4H_6		0.0132	0.0157	0.0244	0.0388	0.0565	0.0774	0.1015	−0.789	0.007	0.162080		
1,2-Pentadiene	C_5H_8				0.0189	0.0294	0.0401	0.0511	0.0624	−17.311	0.092	0.014980		
trans-1,3-Pentadiene	C_5H_8				0.0190	0.0297	0.0404	0.0513	0.0624	−19.350	0.100	0.007280		
1,4-Pentadiene	C_5H_8				0.0203	0.0312	0.0422	0.0535	0.0650	−18.130	0.099	0.011060		
2,3-Pentadiene	C_5H_8				0.0192	0.0294	0.0400	0.0509	0.0621	−15.702	0.087	0.017770		

D3.1. Table 10. (continued)

Substance	Formula	Temperature (°C)								Equation (5)				
		−50	0	25	100	200	300	400	500	10^3 *A*	10^3 *B*	10^6 *C*	10^9 *D*	10^{12} *E*
Acetylene and derivatives														
Acetylene	C_2H_2	0.0140	0.0188	0.0213	0.0295	0.0418	0.0555			−3.020	0.059	0.074580		
Propyne	C_3H_4		0.0138	0.0164	0.0244	0.0354	0.0466	0.0582	0.0700	−13.853	0.097	0.014860		
2-Butyne	C_4H_6				0.0201	0.0306	0.0416	0.0530	0.0648	−15.509	0.088	0.021160		
1-Butyne	C_4H_6			0.0143	0.0225	0.0337	0.0452	0.0569	0.0689	−16.681	0.100	0.014050		
Naphthenes														
Cyclopropane	C_3H_6		0.0135	0.0160	0.0245	0.0383	0.0551	0.0747	0.0972	−1.614	0.016	0.144720		
Cyclobutane	C_4H_8			0.0147	0.0235	0.0373	0.0537	0.0725	0.0938	−6.078	0.033	0.125010		
Cyclopentane	C_5H_{10}				0.0208	0.0338	0.0495	0.0677	0.0885	−5.091	0.021	0.129630		
Methyl cyclopentane	C_6H_{12}				0.0188	0.0304	0.0434	0.0571	0.0711	4.354	−0.058	0.346100	−0.262790	0.072170
Ethyl cyclopentane	C_7H_{14}					0.0291	0.0411	0.0535	0.0665	−20.576	0.093	0.025380		
Propyl cyclopentane	C_8H_{16}					0.0287	0.0392	0.0506	0.0627	−10.781	0.065	0.039010		
Butyl cyclopentane	C_9H_{18}					0.0259	0.0370	0.0484	0.0601	−23.525	0.098	0.012600		
Pentyl cyclopentane	$C_{10}H_{20}$	0.0057	0.0087	0.0105	0.0165	0.0261	0.0369	0.0486	0.0607	1.460	−0.023	0.215370	−0.134660	0.028890
Hexyl cyclopentane	$C_{11}H_{22}$	0.0052	0.0078	0.0093	0.0146	0.0230	0.0324	0.0425	0.0531	1.294	−0.018	0.184080	−0.113900	0.024090
Cyclohexane	C_6H_{12}				0.0187	0.0310	0.0462	0.0642	0.0850	−2.616	0.005	0.140460		
Methyl cyclohexane	C_7H_{14}					0.0311	0.0428	0.0556	0.0694	−10.624	0.064	0.051310		
Ethyl cyclohexane	C_8H_{16}					0.0286	0.0394	0.0511	0.0637	−10.644	0.062	0.044020		
Propyl cyclohexane	C_9H_{18}					0.0272	0.0371	0.0480	0.0601	−5.219	0.043	0.053230		
Butyl cyclohexane	$C_{10}H_{20}$					0.0261	0.0359	0.0465	0.0578	−10.937	0.061	0.035720		
Pentyl cyclohexane	$C_{11}H_{22}$	0.0049	0.0077	0.0093	0.0149	0.0238	0.0339	0.0447	0.0560	1.206	−0.023	0.200870	−0.121290	0.023210
Hexyl cyclohexane	$C_{12}H_{24}$	0.0044	0.0070	0.0084	0.0135	0.0216	0.0308	0.0407	0.0510	1.058	−0.020	0.179090	−0.105400	0.019300
Cyclopentene	C_5H_8				0.0193	0.0310	0.0439	0.0575	0.0711	3.598	−0.055	0.354970	−0.285390	0.083400
Cyclohexene	C_6H_{10}				0.0207	0.0312	0.0426	0.0550	0.0682	−10.302	0.066	0.046170		
Aromatic compounds														
Benzene	C_6H_6				0.0169	0.0263	0.0369	0.0488	0.0618	−7.339	0.042	0.061410		
Toluene	C_7H_8					0.0280	0.0392	0.0517	0.0653	−9.260	0.051	0.059090		
Ethyl benzene	C_8H_{10}					0.0264	0.0375	0.0498	0.0634	−8.932	0.045	0.063110		
Propyl benzene	C_9H_{12}					0.0238	0.0334	0.0433	0.0534	−17.869	0.082	0.013230		
Butyl benzene	$C_{10}H_{14}$					0.0229	0.0323	0.0420	0.0519	−18.506	0.082	0.011860		
Pentyl benzene	$C_{11}H_{16}$						0.0317	0.0408	0.0504	−10.248	0.058	0.025960		
Hexyl benzene	$C_{12}H_{18}$						0.0302	0.0394	0.0488	−18.297	0.079	0.010450		

o-Xylene	C_8H_{10}				0.0200	0.0294	0.0390	0.0486	0.0583	−14.739	0.092	0.003690		
m-Xylene	C_8H_{10}				0.0149	0.0265	0.0382	0.0503	0.0633	−30.341	0.123	0.009470	−0.060540	0.058390
p-Xylene	C_8H_{10}				0.0158	0.0267	0.0380	0.0495	0.0615	−21.818	0.095	0.016980		
1,2,3-Trimethyl benzene	C_9H_{12}					0.0244	0.0334	0.0429	0.0531	−10.155	0.059	0.029520		
1,2,4-Trimethyl benzene	C_9H_{12}					0.0235	0.0322	0.0415	0.0514	−9.642	0.056	0.029870		
1,3,5-Trimethyl benzene	C_9H_{12}					0.0227	0.0321	0.0417	0.0517	−16.563	0.075	0.017570		
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$						0.0322	0.0414	0.0512	−10.379	0.059	0.026580		
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$					0.0229	0.0315	0.0406	0.0503	−10.012	0.056	0.028030		
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$					0.0230	0.0316	0.0407	0.0503	−9.990	0.057	0.027510		
Pentamethyl benzene	$C_{11}H_{16}$						0.0309	0.0401	0.0497	−10.473	0.056	0.028030		
Hexamethyl benzene	$C_{12}H_{18}$						0.0304	0.0394	0.0489	−10.820	0.057	0.026460		
Styrene	C_8H_8					0.0231	0.0322	0.0416	0.0510	−17.470	0.081	0.009440		
Isopropyl benzene	C_9H_{12}					0.0247	0.0348	0.0453	0.0560	−19.870	0.088	0.013230		
Biphenyl	$C_{12}H_{10}$				0.0111	0.0195	0.0279	0.0362	0.0446	−20.015	0.083	0.000330		
Diphenyl methane	$C_{13}H_{12}$						0.0258	0.0332	0.0410	−9.251	0.050	0.019680		
Triphenyl methane	$C_{19}H_{16}$							0.0292	0.0362	−9.366	0.047	0.016050		
Tetraphenyl methane	$C_{25}H_{20}$								0.0311	−14.302	0.056	0.004050		
Naphthalene	$C_{10}H_8$						0.0288	0.0371	0.0458	−9.546	0.053	0.023490		
1-Methylnaphthalene	$C_{11}H_{10}$						0.0278	0.0362	0.0448	−15.377	0.068	0.013020		
2-Methylnaphthalene	$C_{11}H_{10}$						0.0280	0.0360	0.0445	−9.656	0.053	0.022100		
1-Ethylnaphthalene	$C_{12}H_{12}$						0.0271	0.0349	0.0430	−9.589	0.052	0.020140		
2-Ethylnaphthalene	$C_{12}H_{12}$						0.0281	0.0362	0.0447	−9.941	0.054	0.021040		
Alcohols														
Methanol	CH_4O		0.0137	0.0157	0.0227	0.0344	0.0487	0.0656	0.0852	2.362	0.005	0.131510		
Ethanol	C_2H_6O			0.0152	0.0227	0.0348	0.0490	0.0653	0.0839	−2.398	0.024	0.118133	−0.009986	0.003912
1-Propanol	C_3H_8O				0.0216	0.0331	0.0467	0.0623		−3.174	0.028	0.102720		
1-Butanol	$C_4H_{10}O$				0.0225	0.0314	0.0439	0.0599	0.0796	20.932	−0.063	0.178900		
1-Pentanol	$C_5H_{12}O$					0.0273	0.0392	0.0532	0.0692	−2.061	0.014	0.100590		
1-Hexanol	$C_6H_{14}O$					0.0266	0.0382	0.0519	0.0676	−0.248	0.008	0.103440		
1-Heptanol	$C_7H_{16}O$					0.0259	0.0372	0.0504	0.0655	−1.443	0.012	0.096390		
1-Octanol	$C_8H_{18}O$					0.0243	0.0350	0.0477	0.0624	−0.202	0.006	0.097410		
Isopropanol	C_3H_8O				0.0231	0.0348	0.0489	0.0656	0.0848	1.447	0.011	0.124550		
2-Methyl-1-propanol	$C_4H_{10}O$					0.0275	0.0394	0.0531	0.0688	−2.405	0.018	0.096240		
3-Methyl-1-butanol	$C_5H_{12}O$					0.0286	0.0412	0.0559	0.0728	−2.114	0.015	0.106160		
Ethylene glycol	$C_2H_6O_2$					0.0254	0.0357	0.0477	0.0615	−0.375	0.014	0.085000		
1,3-Propylene glycol	$C_3H_8O_2$						0.0401	0.0540	0.0698	−3.521	0.023	0.093530		
Glycerol	$C_3H_8O_3$						0.0313	0.0397	0.0485	−9.158	0.059	0.020260		

D3.1. Table 10. (continued)

Substance	Formula	Temperature (°C)								Equation (5)				
		−50	0	25	100	200	300	400	500	10^3 *A*	10^3 *B*	10^6 *C*	10^9 *D*	10^{12} *E*
Cyclohexanol	$C_6H_{12}O$					0.0283	0.0402	0.0525	0.0653	−21.830	0.095	0.022340		
Benzyl alcohol	C_7H_8O						0.0296	0.0382	0.0468	−18.135	0.082	0.003140		
Phenols														
o-Cresol	C_7H_8O					0.0229	0.0307	0.0388	0.0472	−9.427	0.061	0.016190		
m-Cresol	C_7H_8O						0.0307	0.0388	0.0471	−9.645	0.062	0.015310		
p-Cresol	C_7H_8O						0.0308	0.0389	0.0474	−9.696	0.062	0.015840		
Phenol	C_6H_6O					0.0233	0.0320	0.0407	0.0495	−16.864	0.083	0.003190		
Carboxylic acids														
Formic acid	CH_2O_2					0.0284	0.0372	0.0462	0.0555	−9.344	0.073	0.013480		
Acetic acid	$C_2H_4O_2$			0.0107	0.0160	0.0251	0.0366	0.0504		2.600	−0.008	0.116860		
Propionic acid	$C_3H_6O_2$						0.0418	0.0537		82.837	−0.233	0.282310		
Butyric acid	$C_4H_8O_2$						0.0405	0.0513		118.594	−0.344	0.362900		
Valeric acid	$C_5H_{10}O_2$					0.0251	0.0334	0.0420	0.0509	−9.912	0.066	0.015740		
Caproic acid	$C_6H_{12}O_2$						0.0312	0.0394	0.0479	−9.851	0.063	0.015240		
Acetic anhydride	$C_4H_6O_3$					0.0236	0.0321	0.0407	0.0495	−14.506	0.077	0.007670		
Propionic anhydride	$C_6H_{10}O_3$					0.0191	0.0263	0.0333	0.0402	−16.900	0.080	−0.007700		
Chloroacetic acid	$C_2H_3ClO_2$					0.0192	0.0250	0.0310	0.0370	−7.014	0.053	0.005220		
Dichloroacetic acid	$C_2H_2Cl_2O_2$					0.0151	0.0194	0.0237	0.0280	−5.032	0.042	0.000710		
Trichloroacetic acid	$C_2HCl_3O_2$					0.0135	0.0171	0.0208	0.0244	−4.036	0.038	−0.001120		
Ketones														
Ketene	C_2H_2O		0.0156	0.0180	0.0252	0.0348	0.0442	0.0536	0.0630	−10.895	0.098	−0.003100		
Acetone	C_3H_6O				0.0173	0.0272	0.0392	0.0533	0.0695	−1.474	0.012	0.103580		
Methyl ethyl ketone	C_4H_8O				0.0172	0.0270	0.0392	0.0536	0.0704	0.990	0.000	0.115870		
Diethyl ketone	$C_5H_{10}O$		0.0090	0.0107	0.0168	0.0270	0.0396	0.0547	0.0722	0.018	0.000	0.120990		
Dipropyl ketone	$C_7H_{14}O$					0.0251	0.0371	0.0514	0.0681	0.722	−0.005	0.118740		
Acetophenone	C_8H_8O						0.0273	0.0356	0.0442	−16.048	0.069	0.010920		
Benzophenone	$C_{13}H_{10}O$							0.0278	0.0340	−8.154	0.045	0.011700		
Ethers														
Dimethyl ether	C_2H_6O		0.0138	0.0164	0.0251	0.0384	0.0532	0.0689	0.0851	−0.250	−0.009	0.263410	−0.171130	0.038110
Diethyl ether	$C_4H_{10}O$	0.0092	0.0129	0.0150	0.0222	0.0337	0.0476			−0.513	0.018	0.115680		
Dipropyl ether	$C_6H_{14}O$				0.0184	0.0273	0.0367	0.0465	0.0568	−10.871	0.070	0.022340		
Methyl propyl ether	$C_4H_{10}O$				0.0221	0.0320	0.0424	0.0532	0.0644	−10.912	0.080	0.022060		
Ethyl propyl ether	$C_5H_{12}O$		0.0114	0.0138	0.0208	0.0299				−16.155	0.106	−0.018180		

Ethylene oxide	C_2H_4O		0.0102	0.0121	0.0195	0.0333	0.0514	0.0738	0.1006	6.735	−0.047	0.217600		
Furane	C_4H_4O				0.0208	0.0334	0.0482	0.0654	0.0848	−5.580	0.028	0.115470		
1,4-Dioxane	$C_4H_8O_2$					0.0252	0.0349	0.0466	0.0602	5.404	−0.004	0.097250		
Aldehydes														
Formaldehyde	CH_2O		0.0140	0.0159	0.0222	0.0323	0.0443	0.0581	0.0737	0.887	0.023	0.092560		
Acetaldehyde	C_2H_4O		0.0103	0.0119	0.0174	0.0263	0.0371	0.0496	0.0639	0.076	0.013	0.090020		
Paraldehyde	$C_6H_{12}O_3$					0.0279	0.0389	0.0496	0.0601	−26.540	0.120	−0.010130		
Furfural	$C_5H_4O_2$					0.0246	0.0328	0.0414	0.0503	−9.590	0.064	0.017620		
Benzaldehyde	C_7H_6O					0.0208	0.0285	0.0362	0.0441	−14.819	0.074	0.003070		
Salicylaldehyde	$C_7H_6O_2$					0.0199	0.0275	0.0350	0.0425	−16.830	0.079	−0.003160		
Esters														
Methyl formate	$C_2H_4O_2$				0.0204	0.0316	0.0453	0.0614	0.0799	0.081	0.009	0.122170		
Ethyl formate	$C_3H_6O_2$				0.0183	0.0287	0.0413	0.0561	0.0730	−1.656	0.013	0.107800		
Propyl formate	$C_4H_8O_2$				0.0156	0.0249	0.0363	0.0499	0.0656	−0.466	0.003	0.106020		
Methyl acetate	$C_3H_6O_2$				0.0178	0.0278	0.0401	0.0546	0.0715	0.813	0.003	0.114990		
Ethyl acetate	$C_4H_8O_2$		0.0092	0.0107	0.0159	0.0248	0.0361	0.0496	0.0654	2.735	−0.007	0.114350		
Propyl acetate	$C_5H_{10}O_2$					0.0242	0.0356	0.0491	0.0647	0.005	0.000	0.108330		
Methyl propionate	$C_4H_8O_2$				0.0159	0.0250	0.0363	0.0497	0.0653	0.707	0.001	0.107360		
Ethyl propionate	$C_5H_{10}O_2$				0.0142	0.0217	0.0314	0.0430	0.0567	3.777	−0.010	0.101720		
Propyl propionate	$C_6H_{12}O_2$					0.0246	0.0361	0.0499	0.0660	1.430	−0.006	0.115150		
Methyl butyrate	$C_5H_{10}O_2$					0.0237	0.0347	0.0478	0.0631	−0.099	0.001	0.104930		
Ethyl butyrate	$C_6H_{12}O_2$					0.0228	0.0336	0.0465	0.0614	0.286	−0.002	0.104790		
Methyl benzoate	$C_8H_8O_2$					0.0178	0.0249	0.0321	0.0393	−14.909	0.068	0.003120		
Ethyl benzoate	$C_9H_{10}O_2$						0.0246	0.0317	0.0389	−15.024	0.068	0.002650		
Methyl salicylate	$C_8H_8O_3$						0.0236	0.0298	0.0362	−7.619	0.048	0.011280		
Amines														
Methyl amine	CH_5N		0.0132	0.0158	0.0252	0.0411	0.0611			0.998	−0.010	0.200200		
Ethyl amine	C_2H_7N			0.0169	0.0254	0.0372	0.0494	0.0622	0.0754	−14.418	0.098	0.023590		
Propyl amine	C_3H_9N				0.0225	0.0336	0.0454	0.0576	0.0704	−14.582	0.089	0.026680		
n-Butyl amine	$C_6H_{15}N$		0.0125	0.0145	0.0209	0.0306	0.0413	0.0526	0.0642	−0.321	0.012	0.150360	−0.086020	0.014280
Dimethyl amine	C_2H_7N			0.0204	0.0300	0.0433	0.0573	0.0719	0.0871	−14.266	0.107	0.031230		
Trimethyl amine	C_3H_9N		0.0128	0.0154	0.0239	0.0365	0.0499	0.0634	0.0770	−2.224	−0.008	0.294620	−0.263930	0.086550
Diethyl amine	$C_6H_{15}N$		0.0113	0.0140	0.0222	0.0335	0.0451	0.0571	0.0695	−16.698	0.098	0.017830		
Triethyl amine	$C_6H_{15}N$		0.0102	0.0124	0.0198	0.0310	0.0431	0.0555	0.0681	−0.268	−0.025	0.295400	−0.257610	0.084340
Piperidine	$C_5H_{11}N$					0.0319	0.0444	0.0569	0.0691	−29.974	0.135	−0.008300		
Pyridine	C_6H_7N					0.0240	0.0354	0.0487	0.0639	−3.523	0.012	0.096720		
Aniline	C_6H_7N					0.0246	0.0328	0.0414	0.0503	−9.960	0.065	0.016230		

D3.1. Table 10. (continued)

Substance	Formula	Temperature (°C)								Equation (5)				
		−50	0	25	100	200	300	400	500	10^3 *A*	10^3 *B*	10^6 *C*	10^9 *D*	10^{12} *E*
N-methyl aniline	C_7H_9N					0.0242	0.0334	0.0427	0.0521	−18.314	0.088	0.003880		
N,*N*-dimethyl aniline	$C_8H_{11}N$					0.0210	0.0298	0.0387	0.0477	−18.759	0.081	0.006300		
N,*N*-diethyl aniline	$C_{10}H_{15}N$						0.0288	0.0369	0.0453	−9.478	0.055	0.020120		
Phenylhydrazine	$C_6H_8N_2$						0.0290	0.0368	0.0448	−9.778	0.059	0.014480		
Diphenyl amine	$C_{12}H_{11}N$							0.0325	0.0397	−9.441	0.054	0.012730		
Nitriles														
Acetonitrile	C_2H_3N				0.0141	0.0218	0.0320	0.0447	0.0600	7.632	−0.030	0.125860		
Propionitrile	C_3H_5N		0.0076	0.0090	0.0140	0.0226	0.0336	0.0472	0.0640	0.189	0.001	0.100180	−0.018130	0.033270
Butyronitrile	C_4H_7N		0.0070	0.0092	0.0159	0.0251	0.0344	0.0439	0.0536	−16.453	0.083	0.009510		
Benzonitrile	C_7H_5N					0.0224	0.0302	0.0383	0.0467	−9.406	0.059	0.017860		
Amides														
Formamide	CH_3NO						0.0367	0.0462	0.0562	−11.800	0.075	0.016570		
Nitroderivates														
Nitromethane	CH_3NO_2					0.0216	0.0297	0.0380	0.0464	−15.934	0.077	0.004770		
Nitrobenzene	$C_6H_5NO_2$						0.0287	0.0364	0.0446	−9.275	0.056	0.017100		
o-Nitrotoluene	$C_7H_7NO_2$						0.0263	0.0334	0.0408	−8.654	0.052	0.015100		
m-Nitrotoluene	$C_7H_7NO_2$						0.0260	0.0331	0.0404	−8.730	0.052	0.014750		
p-Nitrotoluene	$C_7H_7NO_2$						0.0259	0.0329	0.0402	−8.747	0.052	0.014500		

D3.1. Table 11. Surface tensions in mN/m

Substance	Formula	Temperature (°C)								Equation (6)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Elements														
Xenon	Xe	8.2	4.5	1.4						0.05435	1.28359			
Krypton	Kr									0.04405	1.22807			
Argon	Ar									0.03813	1.29069			
Air										0.02919	1.15656	0.06889	0.17918	−0.14564
Nitrogen	N_2									0.02921	1.25537			
Oxygen	O_2									0.03797	1.21036			
Sulfur	S							58.3	55.0	0.08603	1.00082			
Fluorine	F_2									0.04004	1.22411			
Chlorine	Cl_2	29.4	25.3	21.3	18.1	13.4	5.9			0.06760	1.08562			
Bromine	Br_2			45.2	41.8	36.8	28.8	21.0	13.6	0.09404	1.16321			
Iodine	I_2							44.3		0.23475	2.29332			
Anorganic compounds														
Hydrogen fluoride	HF	14.3	12.3	10.3	8.8	6.6	3.5	1.1		0.03648	1.41220			
Hydrogen chloride	HCl	18.9	13.1	7.8	4.1					0.08517	1.29670			
Hydrogen bromide	HBr	23.5	18.5	13.7	10.1	5.1				0.07541	1.22318			
Hydrogen iodide	HI	28.6	24.7	21.0	18.0	13.6	6.5			0.06376	1.07475			
Hydrogen cyanide	HCN			20.6	18.3	14.9	9.2	3.6		0.05231	1.02047			
Water	H_2O			77.8	73.8	67.9	58.2	48.3	37.7	0.15488	1.64129	−0.75986	−0.85291	1.14113
Hydrogen sulfide	H_2S	22.8	18.0	13.5	10.1	5.5				0.07436	1.30090			
Ammonia	NH_3	38.5	32.2	26.1	21.4	14.6	4.7			0.10175	1.21703			
Nitric oxide	NO									0.12062	1.54592			
Nitrogen dioxide	NO_2			31.1	27.3	21.6	11.9			0.08109	0.95509			
Nitrous oxide	N_2O	15.3	10.1	5.4	2.1					0.07134	1.20607			
Dinitrogentetroxide	N_2O_4			49.4	41.9	31.1	14.5	1.3		0.16856	1.22183			
Cyanogen	C_2N_2		22.9	18.5	15.0	10.1	2.9			0.07339	1.20282			
Phosphorus trichloride	PCl_3	38.3	34.9	31.5	28.9	25.0	18.8	12.9	7.5	0.07098	1.22441			
Cyanogen chloride	ClCN			26.1	22.6	17.5	9.6	2.7		0.07941	1.18902			
Silane	SiH_4	5.1	2.0							0.04274	1.21421			
Tetrachlorosilane	$SiCl_4$	26.6	24.0	21.3	19.3	16.2	11.3	6.6	2.4	0.05154	1.14006			
Carbon monoxide	CO									0.02792	1.13266			
Carbon dioxide	CO_2	15.2	9.5	4.5	1.2					0.08167	1.27339			
Carbon suboxide	C_3O_2	40.9	34.9	29.1	24.6	18.1	8.2	0.4		0.10041	1.21621			

D3.1. Table 11. (continued)

Substance	Formula	Temperature (°C)								Equation (6)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Carbonyl sulfide	COS	20.6	16.0	11.7	8.6	4.6				0.07598	1.46595			
Phosgene	CCl_2O	29.8	26.1	22.5	19.7	15.5	8.9	3.0		0.06520	1.16027			
Carbon disulfide	CS_2	43.5	39.5	35.5	32.4	27.8	20.6	13.7	7.5	0.08219	1.22945			
Sulfur dioxide	SO_2	36.8	31.7	26.6	22.7	16.9	8.1			0.08730	1.18191			
Sulfur trioxide	SO_3				34.1	27.9	18.1	9.2	1.8	0.10346	1.21917			
Sulfuryl chloride	Cl_2SO_2	46.0	41.5	37.1	33.6	28.6	20.6	13.3	6.8	0.09002	1.27637			
Sulfur hexafluoride	SF_6	11.6	8.6							0.03785	0.98021			
Organic compounds containing sulfur														
Methyl mercaptan	CH_4S	37.2	32.6	28.2	24.7	19.7	11.8	4.8		0.08186	1.22601			
Ethyl mercaptan	C_2H_6S	32.0	28.9	25.8	23.4	19.8	13.9	8.1	2.6	0.06002	1.06332			
Dimethyl sulfide	C_2H_6S	34.6	31.1	27.6	24.8	20.8	14.3	8.2	2.6	0.06790	1.15009			
Diethyl sulfide	$C_4H_{10}S$	33.6	30.5	27.6	25.2	21.8	16.3	11.1	6.3	0.06254	1.21632			
Thiophene	C_4H_4S		39.0	35.1	32.1	27.7	20.7	14.3	8.5	0.08229	1.33643			
Halogenated hydrocarbons														
Fluoromethane (R41)	CH_3F	14.2	9.6	5.5	2.5					0.06598	1.26598			
Difluoromethane (R32)	CH_2F_2	21.0	15.9	11.1	7.6	3.0				0.07647	1.28512			
Trifluoromethane (R23)	CHF_3	10.8	6.6	2.9						0.05858	1.23456			
Tetrafluoromethane (R14)	CF_4	0.4								0.05626	1.23364			
Methyl chloride	CH_3Cl	28.5	23.8	19.4	16.0	11.2	4.2			0.07623	1.28255			
Methylene chloride	CH_2Cl_2	40.2	35.8	31.4	28.1	23.2	15.5	8.6	2.9	0.08432	1.28714			
Chloroform	$CHCl_3$	36.8	33.4	30.0	27.3	23.4	17.1	11.1	5.6	0.06931	1.17639			
Carbon tetrachloride	CCl_4			29.4	26.9	23.2	17.3	11.8	6.7	0.06666	1.21285			
Bromomethane	CH_3Br	34.4	29.9	25.5	22.1	17.3	9.9	3.7		0.08027	1.30463			
Dibromomethane	CH_2Br_2	53.1	48.7	44.4	41.0	36.0	28.0	20.6	13.8	0.09615	1.30603			
Tribromomethane	$CHBr_3$				45.5	41.6	35.1	28.8	22.7	0.08674	1.17862			
Tetrabromomethane	CBr_4						62.6	51.9	41.6	0.15153	1.22270			
Chlorodifluoromethane (R22)	$CHClF_2$	19.8	15.7	11.8	8.8	4.7				0.06238	1.23996			
Dichlorofluoromethane (R21)	$CHCl_2F$	29.5	25.5	21.6	18.6	14.3	7.7			0.06925	1.25278			
Chlorotrifluoromethane (R13)	$CClF_3$	10.1	6.3	2.9						0.05415	1.25006			
Dichlorodifluoromethane (R12)	CCl_2F_2		15.5	12.0	9.3	5.6	0.7			0.05898	1.28862			
Trichlorofluoromethane (R11)	CCl_3F	28.4	24.8	21.3	18.6	14.7	8.7	3.5		0.06409	1.27077			
Ethyl fluoride (R161)	C_2H_5F	19.7	16.2	12.6	9.9	6.0				0.05419	1.11840			

Ethyl chloride	C_2H_5Cl	29.1	25.3	21.7	18.9	14.8	8.5	3.0		0.06597	1.23494			
Ethyl bromide	C_2H_5Br	35.2	31.1	27.2	24.1	19.7	12.9	6.8	1.9	0.07599	1.31627			
1,1-Dichloroethane	$C_2H_4Cl_2$	35.5	31.9	28.3	25.5	21.4	15.0	9.0	3.8	0.07110	1.24746			
1,2-Dichloroethane	$C_2H_4Cl_2$		39.1	35.3	32.3	27.8	20.8	14.2	8.1	0.08099	1.24885	0.00096	−0.01186	0.00695
1,2-Dibromoethane	$C_2H_4Br_2$				38.8	34.9	28.4	22.3	16.4	0.08093	1.22574			
1,1,1-Trifluoroethane (R143a)	$C_2H_3F_3$	15.9	12.3	8.9	6.2	2.5				0.05023	1.11401			
1,1,1-Trichloroethane	$C_2H_3Cl_3$		31.4	28.2	25.7	22.0	16.1	10.6	5.6	0.06587	1.22121			
1,1,2,2-Tetrachloroethane	$C_2H_2Cl_4$		41.9	38.6	36.1	32.3	26.2	20.4	14.9	0.07626	1.23498			
Pentachloroethane	C_2HCl_5		40	37.1	34.8	31.4	25.9	20.5	15.3	0.07017	1.15768			
Hexachloroethane	C_2Cl_6								31.9	0.14133	1.30430			
1,1,2,2-Tetrachlorodifluoroethane	$C_2Cl_4F_2$					20.5	14.9	9.7	5.1	0.06418	1.29363			
1,1,2-Trichlorotrifluoroethan	$C_2Cl_3F_3$		22.9	20	17.7	14.4	9.2	4.5	0.7	0.05521	1.23559			
1,2-Dichlorotetrafluoroethane	$C_2Cl_2F_4$	20.1	16.9	13.9	11.5	8.2	3.3			0.05178	1.24664			
1-Chloropropane	C_3H_7Cl	31.7	28.1	24.6	21.9	18	11.9	6.4	1.8	0.06684	1.27458			
1-Chlorobutane	C_4H_9Cl	31.8	28.8	26	23.7	20.4	15	9.8	4.9	0.06373	1.36371	0.17790	−1.11469	0.86417
1-Chloropentane	$C_5H_{11}Cl$	33.4	30.5	27.7	25.5	22.2	16.9	11.9		0.06031	1.18716			
Chlorotrifluoroethene	C_2ClF_3	25.9	20.6	15.6	11.8	6.7				0.08373	1.31939			
Vinyl chloride	C_2H_3Cl	27.9	23.7	19.7	16.6	12.2	5.6			0.07032	1.27270			
1,1-Dichloroethene	$C_2H_2Cl_2$	36.4	32.2	28.1	24.9	20.2	12.8	6.1		0.07702	1.20663			
Trichloroethene	C_2HCl_3	39.7	36	32.5	29.7	25.7	19.2	13.2	7.8	0.07498	1.28458			
Tetrachloroethene	C_2Cl_4			34.7	32.2	28.6	22.8	17.3	12.1	0.07067	1.22671			
Fluorobenzene	C_6H_5F		33.7	30.2	27.5	23.5	17.3	11.5	6.4	0.07216	1.30234			
Chlorobenzene	C_6H_5Cl		39.1	36	33.5	29.9	24	18.4	13.1	0.07269	1.24185			
Bromobenzene	C_6H_5Br		41.9	38.9	36.5	33	27.2	21.7	16.4	0.07406	1.23020			
Iodobenzene	C_6H_5I		44.7	41.8	39.5	36	30.4	25	19.9	0.07595	1.25538			
m-Chlorotoluene	C_7H_7Cl		38.8	35.8	33.4	30	24.6	19.5	14.6	0.07978	1.77729	−0.55705	−0.51952	0.63993
Benzyl chloride	C_7H_7Cl		43.4	40.1	37.5	33.7	27.7	21.9	16.5	0.07908	1.33849			
***n*-Alkanes**														
Methane	CH_4									0.03640	1.14306			
Ethane	C_2H_6	10.1	6.5	3.3	1.0					0.04863	1.19828			
Propane	C_3H_8	16.5	13.1	9.9	7.5	4.1				0.05094	1.22051			
n-Butane	C_4H_{10}	21.0	17.9	14.8	12.5	9.1	4.0			0.05203	1.21961			
n-Pentane	C_5H_{12}	23.9	21.0	18.2	16.0	12.8	7.7	3.2		0.05202	1.20435			
n-Hexane	C_6H_{14}	26.4	23.5	20.7	18.5	15.2	10.2	5.7		0.05500	1.26769			
n-Heptane	C_7H_{16}	27.8	25.1	22.4	20.3	17.3	12.5	8.0	4.0	0.05422	1.25287			
n-Octane	C_8H_{18}	28.6	26.0	23.6	21.6	18.8	14.2	9.8	5.9	0.05277	1.23210			

D3.1. Table 11. (continued)

Substance	Formula	Temperature (°C)								Equation (6)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
n-Nonane	C_9H_{20}	30.0	27.4	24.9	22.9	20.0	15.4	11.1	7.1	0.05496	1.28917			
n-Decane	$C_{10}H_{22}$		28.3	25.8	23.9	21.0	16.5	12.2	8.3	0.05540	1.30900			
n-Undecane	$C_{11}H_{24}$		29.0	26.6	24.7	21.9	17.5	13.3	9.4	0.05555	1.32037			
n-Dodecane	$C_{12}H_{26}$			27.2	25.4	22.7	18.3	14.2	10.3	0.05549	1.32644			
n-Tridecane	$C_{13}H_{28}$			27.8	26.0	23.3	19.0	15.0	11.2	0.05539	1.32719			
n-Tetradecane	$C_{14}H_{30}$				26.6	23.9	19.6	15.6	11.8	0.05634	1.36445			
n-Pentadecane	$C_{15}H_{32}$				27.2	24.5	20.2	16.2	12.5	0.05644	1.36901			
n-Hexadecane	$C_{16}H_{34}$				27.6	24.9	20.7	16.6	12.9	0.05742	1.40834			
n-Heptadecane	$C_{17}H_{36}$					25.3	21.1	17.2	13.4	0.05701	1.40336			
n-Octadecane	$C_{18}H_{38}$					25.8	21.6	17.6	13.9	0.05782	1.42315			
n-Nonadecane	$C_{19}H_{40}$					26.1	21.9	17.9	14.2	0.05806	1.44010			
n-Eicosane	$C_{20}H_{42}$					26.5	22.3	18.3	14.5	0.05887	1.46686			
Isoalkanes														
Isobutane	C_4H_{10}	19.0	15.9	12.8	10.5	7.2	2.3			0.05132	1.25196			
2-Methyl butane	C_5H_{12}	22.9	20.0	17.2	15.0	11.8	6.8	2.4		0.05095	1.20843			
2,2-Dimethyl propane	C_5H_{12}			13.4	11.4	8.4	4.0	0.4		0.04660	1.25255			
2-Methyl pentane	C_6H_{14}	24.7	22.0	19.4	17.4	14.4	9.6	5.2	1.4	0.05005	1.18920			
3-Methyl pentane	C_6H_{14}	25.8	23.0	20.3	18.1	15.0	10.0	5.5	1.7	0.05324	1.24020			
2,2-Dimethyl butane	C_6H_{14}	23.3	20.7	18.2	16.3	13.4	8.8	4.6		0.04744	1.16905			
2,3-Dimethyl butane	C_6H_{14}	24.7	22.0	19.4	17.4	14.4	9.7	5.3	1.5	0.05015	1.20133			
Olefins														
Ethylene	C_2H_4	7.2	3.6							0.05296	1.27846			
Propylene	C_3H_6	17.1	13.6	10.2	7.6	4.0				0.05312	1.19763			
1-Butene	C_4H_8	22.0	18.6	15.3	12.7	9.1	3.7			0.05607	1.23722			
1-Pentene	C_5H_{10}	23.8	21.0	18.2	16.0	12.8	7.7	3.1		0.05072	1.15769			
1-Hexene	C_6H_{12}	25.9	23.2	20.5	18.4	15.3	10.4	5.9	1.9	0.05216	1.19509			
1-Heptene	C_7H_{14}	28.3	25.4	22.6	20.4	17.2	12.2	7.6	3.6	0.05697	1.33692	−0.12198	0.13265	−0.05353
1-Octene	C_8H_{16}	28.9	26.3	23.8	21.8	18.9	14.2	9.8	5.7	0.05394	1.24599			
Propadiene	C_3H_4	19.8	16.2	12.7	10.0	6.4	1.3			0.05813	1.28260			
1,2-Butadiene	C_4H_6	25.4	21.8	18.3	15.6	11.8	6.1	1.6		0.06322	1.33841			
1,3-Butadiene	C_4H_6	22.2	18.8	15.6	13.1	9.5	4.1			0.05629	1.24878			
1,2-Pentadiene	C_5H_8	27.8	24.6	21.5	19.1	15.6	10.2	5.3	1.4	0.05944	1.28818			
trans-1,3-Pentadiene	C_5H_8	25.4	22.4	19.5	17.3	14.1	9.1	4.7		0.05506	1.31227			

1,4-Pentadiene	C_5H_8	26.9	22.9	19.1	16.2	12.3	6.6	2.4		0.07299	1.58928			
2,3-Pentadiene	C_5H_8	27.5	24.3	21.2	18.9	15.4	10.0	5.2	1.2	0.05870	1.27433			
Acetylene and derivatives														
Acetylene	C_2H_2	13.2	8.9	4.8	1.9					0.05698	1.13545			
Propyne	C_3H_4	24.9	21.0	17.2	14.2	9.8	3.2			0.06252	1.13872			
2-Butyne	C_4H_6		28.8	24.9	21.8	17.4	10.5	4.4		0.07283	1.24690			
1-Butyne	C_4H_6	26.0	22.7	19.4	16.8	13.0	7.0	1.5		0.05729	1.11793			
Naphthenes														
Cyclopropane	C_3H_6	23.5	19.4	15.4	12.4	8.1	2.0			0.06588	1.25086			
Cyclobutane	C_4H_8	31.3	27.2	23.3	20.2	15.7	8.9	3.0		0.07176	1.25065			
Cyclopentane	C_5H_{10}	33.2	29.3	25.4	22.5	18.3	11.9	6.3		0.07418	1.40256			
Methyl cyclopentane	C_6H_{12}	30.8	27.7	24.6	22.2	18.8	13.3	8.2	3.8	0.06138	1.27048			
Ethyl cyclopentane	C_7H_{14}	31.3	28.6	25.9	23.8	20.8	15.8	11.1	6.7	0.05675	1.19902			
Propyl cyclopentane	C_8H_{16}	32.0	29.4	26.9	24.9	22.0	17.2	12.7	8.4	0.05638	1.20639			
Butyl cyclopentane	C_9H_{18}	32.8	30.3	27.8	25.9	23.0	18.3	13.9	9.7	0.05690	1.23479			
Pentyl cyclopentane	$C_{10}H_{20}$			29.9	27.0	23.0	16.9	11.7		0.08233	1.88316			
Hexyl cyclopentane	$C_{11}H_{22}$			30.4	27.6	23.6	17.6	12.4		0.08116	1.83729			
Cyclohexane	C_6H_{12}			27.7	25.3	21.6	15.9	10.5	5.7	0.06560	1.26601			
Methyl cyclohexane	C_7H_{14}	32.3	29.2	26.2	23.9	20.5	15.1	10.2	5.9	0.06306	1.35225			
Ethyl cyclohexane	C_8H_{16}	33.2	30.4	27.7	25.6	22.5	17.5	12.8	8.5	0.06008	1.30159			
Propyl cyclohexane	C_9H_{18}	33.2	30.8	28.4	26.5	23.8	19.3	15.0	10.9	0.05586	1.21290			
Butyl cyclohexane	$C_{10}H_{20}$	34.0	31.5	29.0	27.0	24.1	19.5	15.2	11.1	0.05898	1.35018			
Pentyl cyclohexane	$C_{11}H_{22}$			30.4	27.6	23.6	17.5	12.4		0.08212	1.88661			
Hexyl cyclohexane	$C_{12}H_{24}$			29.8	28.0	25.3	21.0	16.8	12.9	0.05687	1.29305			
Cyclopentene	C_5H_8	32.6	29.0	25.5	22.8	18.8	12.6	7.0	2.2	0.06801	1.26679			
Cyclohexene	C_6H_{10}	35.7	32.4	29.2	26.6	22.9	17.0	11.5	6.5	0.06763	1.25801			
Aromatic compounds														
Benzene	C_6H_6				28.9	24.9	18.7	12.8	7.3	0.07178	1.23593			
Toluene	C_7H_8	37.1	34.0	30.9	28.5	25.0	19.3	14.0	9.0	0.06676	1.24386			
Ethyl benzene	C_8H_{10}	37.3	34.3	31.4	29.1	25.8	20.4	15.2	10.5	0.06576	1.26285			
Propyl benzene	C_9H_{12}	36.7	33.9	31.2	29.0	25.9	20.8	15.9	11.4	0.06332	1.26870			
Butyl benzene	$C_{10}H_{14}$	36.8	34.0	31.3	29.2	26.0	21.0	16.3	11.9	0.06364	1.32979			
Pentyl benzene	$C_{11}H_{16}$	36.5	34.0	31.5	29.6	26.7	22.1	17.6	13.4	0.06026	1.26163			
Hexyl benzene	$C_{12}H_{18}$	37.2	34.7	32.3	30.4	27.5	22.9	18.5	14.3	0.06098	1.28086			
o-Xylene	C_8H_{10}		35.2	32.3	30.1	26.8	21.5	16.4	11.7	0.06547	1.24184			
m-Xylene	C_8H_{10}		34.0	31.1	28.8	25.5	20.1	15.0	10.3	0.06539	1.27146			

D3.1. Table 11. (continued)

Substance	Formula	Temperature (°C)								Equation (6)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
p-Xylene	C_8H_{10}				28.5	25.1	19.8	14.8	10.1	0.06456	1.26881			
1,2,3-Trimethyl benzene	C_9H_{12}		36.1	33.4	31.3	28.1	23.1	18.2	13.6	0.06489	1.25491			
1,2,4-Trimethyl benzene	C_9H_{12}		34.5	31.8	29.7	26.6	21.6	16.8	12.3	0.06319	1.25600			
1,3,5-Trimethyl benzene	C_9H_{12}		32.9	30.4	28.5	25.5	20.8	16.2	11.8	0.05903	1.18447			
1,2,3,4-Tetramethyl benzene	$C_{10}H_{14}$			38.8	36.5	33.1	27.6	22.4	17.3	0.07244	1.24623			
1,2,3,5-Tetramethyl benzene	$C_{10}H_{14}$			36.2	34.0	30.8	25.5	20.5	15.7	0.06826	1.23312			
1,2,4,5-Tetramethyl benzene	$C_{10}H_{14}$						22.9	18.5	14.3	0.05884	1.17748			
Pentamethyl benzene	$C_{11}H_{16}$						29.8	24.4	19.2	0.07615	1.28379			
Hexamethyl benzene	$C_{12}H_{18}$								23.5	0.07106	1.12978			
Styrene	C_8H_8		38.5	35.1	32.5	28.8	23.0	17.5	12.2	0.09046	2.08018	−0.54300	−1.54530	1.58212
Isopropyl benzene	C_9H_{12}	36.1	33.2	30.4	28.2	25.0	19.9	15.0	10.5	0.06364	1.30197			
Biphenyl	$C_{12}H_{10}$						32.2	27.2	22.5	0.09827	2.35540	−1.14035	−0.87565	1.17200
Diphenyl methane	$C_{13}H_{12}$					35.7	30.7	25.9	21.2	0.07086	1.23688			
Triphenyl methane	$C_{19}H_{16}$						34.4	30.0	25.6	0.07159	1.29713			
Tetraphenyl methane	$C_{25}H_{20}$									0.15512	1.30899			
Naphthalene	$C_{10}H_8$						31.8	26.1	20.7	0.08245	1.37955			
1-Methylnaphthalene	$C_{11}H_{10}$		45.7	42.9	40.7	37.4	32.1	27.0	22.1	0.07538	1.29250			
2-Methylnaphthalene	$C_{11}H_{10}$					35.1	30.1	25.3	20.7	0.07043	1.25945			
1-Ethylnaphthalene	$C_{12}H_{12}$			40.5	38.4	35.4	30.4	25.6	21.0	0.07116	1.29758			
2-Ethylnaphthalene	$C_{12}H_{12}$			39.1	37.0	34.0	29.1	24.4	19.9	0.06961	1.31923			
Alcohols														
Methanol	CH_4O			24.2	22.6	20.1	15.6	10.4		0.04372	0.86460	−0.07327	−0.51872	0.66269
Ethanol	C_2H_6O			24.1	22.5	19.9	15.3	10.2	4.5	0.06165	2.37635	−3.15086	1.98424	−0.15806
1-Propanol	C_3H_8O				23.8	21.4				0.04419	0.78485			
1-Butanol	$C_4H_{10}O$			26.4	24.8	22.3	18.0			0.04839	0.91063			
1-Pentanol	$C_5H_{12}O$				25.7	23.1	18.8			0.05084	0.98216			
1-Hexanol	$C_6H_{14}O$		30.1	28.0	26.3	23.8	19.6	15.5	11.3	0.05089	1.01000			
1-Heptanol	$C_7H_{16}O$		31.1	28.9	27.2	24.5	20.2	16.0	11.8	0.05380	1.09810			
1-Octanol	$C_8H_{18}O$			29.1	27.5	25.1	21.1	17.2	13.3	0.05146	1.04985			
Isopropanol	C_3H_8O			22.9	21.4	19.0				0.04172	0.77686			
2-Methyl-1-propanol	$C_4H_{10}O$				22.9	20.6	16.5			0.04451	0.86556			
3-Methyl-1-butanol	$C_5H_{12}O$	30.4	28.2	26.0	24.3	21.7	17.3	13.0	8.7	0.05018	1.02349			
Ethylene glycol	$C_2H_6O_2$			50.0	48.4	45.8	41.4	36.9		0.07130	0.74162			

1,3-Propylene glycol	$C_3H_8O_2$				46.0	43.2	38.5			0.07242	0.87291			
Glycerol	$C_3H_8O_3$				64.1	61.3	56.6	51.7		0.09019	0.80707			
Cyclohexanol	$C_6H_{12}O$					30.8	25.5	20.4	15.4	0.06671	1.12611			
Benzyl alcohol	C_7H_8O			42.0	39.8	36.5	31.2	25.9	20.9	0.07347	1.17511			
Phenols														
o-Cresol	C_7H_8O					34.9	29.6	24.5	19.4	0.07124	1.14543			
m-Cresol	C_7H_8O				37.0	34.1	29.2	24.5	19.8	0.06621	1.08611			
p-Cresol	C_7H_8O					33.9	29.4	24.9	20.4	0.06352	1.02226			
Phenol	C_6H_6O					37.9	32.5	27.1	21.7	0.07444	1.07602			
Carboxylic acids														
Formic acid	CH_2O_2				37.7	34.4	28.9			0.06684	0.83158			
Acetic acid	$C_2H_4O_2$				27.5	24.6	19.7	14.9	10.2	0.05749	1.07671			
Propionic acid	$C_3H_6O_2$			28.7	26.7	23.7	18.8	14.1	9.6	0.05827	1.16546			
Butyric acid	$C_4H_8O_2$			28.6	26.6	23.8	19.1	14.6	10.3	0.05651	1.16381			
Valeric acid	$C_5H_{10}O_2$		29.5	27.2	25.5	22.9	18.6	14.5	10.6	0.05273	1.17141			
Caproic acid	$C_6H_{12}O_2$			29.6	27.9	25.4	21.2	17.1	13.1	0.05396	1.12272			
Acetic anhydride	$C_4H_6O_3$	43.7	39.7	35.7	32.7	28.3	21.4	15.2	9.6	0.08435	1.43282			
Propionic anhydride	$C_6H_{10}O_3$		35.9	32.8	30.4	26.9	21.3	16.0	11.0	0.06895	1.28546			
Chloroacetic acid	$C_2H_3ClO_2$						31.8	25.8	20.1	0.08078	1.18886			
Dichloroacetic acid	$C_2H_2Cl_2O_2$				35.7	32.9	28.3	23.7	19.1	0.06283	1.01553			
Trichloroacetic acid	$C_2HCl_3O_2$					31.0	26.5	22.0	17.6	0.06108	1.07076			
Ketones														
Ketene	C_2H_2O	16.4	12.9	9.6	7.1	3.8				0.05360	1.28253			
Acetone	C_3H_6O	32.5	29.3	26.1	23.7	20.0	14.0	8.3	3.1	0.06223	1.12463			
Methyl ethyl ketone	C_4H_8O	32.6	29.7	26.8	24.5	21.2	15.7	10.4	5.4	0.05945	1.11696			
Diethyl ketone	$C_5H_{10}O$		30.3	27.5	25.3	22.0	16.7	11.6	6.9	0.06000	1.17040			
Dipropyl ketone	$C_7H_{14}O$		30.6	28.0	25.9	22.8	17.9	13.2	8.8	0.05888	1.23032			
Acetophenone	C_8H_8O				39.5	36.1	30.6	25.2	20.0	0.07479	1.19785			
Benzophenone	$C_{13}H_{10}O$					40.9	35.7	30.8	26.0	0.07725	1.29069			
Ethers														
Dimethyl ether	C_2H_6O	22.4	18.6	14.9	12.0	8.0	2.2			0.06105	1.23032			
Diethyl ether	$C_4H_{10}O$	25.9	22.7	19.5	17.0	13.5	7.9	3.1		0.05804	1.23997			
Dipropyl ether	$C_6H_{14}O$	28.2	25.4	22.7	20.5	17.4	12.4	7.8	3.6	0.05497	1.22576			
Methyl propyl ether	$C_4H_{10}O$	27.7	24.1	20.7	18.1	14.3	8.5	3.6		0.06336	1.31065			
Ethyl propyl ether	$C_5H_{12}O$	27.4	24.6	21.9	19.8	16.6	11.5	6.6	2.1	0.05275	1.11029			
Ethylene oxide	C_2H_4O	35.8	31.7	27.6	24.4	19.7	12.2	5.3		0.07469	1.14048			

D3.1. Table 11. (continued)

Substance	Formula	Temperature (°C)								Equation (6)				
		−50	−25	0	20	50	100	150	200	*A*	*B*	*C*	*D*	*E*
Furane	C_4H_4O	33.9	30.3	26.8	24.1	20.0	13.4	7.2	1.5	0.06708	1.12451			
1,4-Dioxane	$C_4H_8O_2$				33.7	29.3	22.3	15.8	9.9	0.08221	1.29052			
Aldehydes														
Formaldehyde	CH_2O	54.6	45.0	35.9	29.0	19.4	6.0			0.15579	1.32552			
Acetaldehyde	C_2H_4O	32.7	28.6	24.6	21.5	17.0	10.0	3.9		0.07272	1.22767			
Paraldehyde	$C_6H_{12}O_3$				26.2	22.8	17.4	12.3	7.6	0.06289	1.24144			
Furfural	$C_5H_4O_2$		49.6	46.3	43.6	39.6	33.1	26.8	20.6	0.08451	1.15138			
Benzaldehyde	C_7H_6O	47.7	44.6	41.6	39.2	35.7	29.9	24.4	19.0	0.07643	1.21837			
Salicylaldehyde	$C_7H_6O_2$				42.8	39.0	33.0	27.0	21.2	0.08057	1.12359			
Esters														
Methyl formate	$C_2H_4O_2$	37.1	32.7	28.4	25.1	20.2	12.7	6.1		0.08104	1.27510			
Ethyl formate	$C_3H_6O_2$	32.3	29.2	26.1	23.7	20.1	14.2	8.6	3.2	0.06099	1.10043			
Propyl formate	$C_4H_8O_2$	32.5	29.6	26.8	24.5	21.2	15.7	10.5	5.5	0.05942	1.12521			
Methyl acetate	$C_3H_6O_2$	33.8	30.7	27.6	25.1	21.5	15.4	9.4	3.6	0.06212	1.04624			
Ethyl acetate	$C_4H_8O_2$	32.1	29.1	26.1	23.8	20.4	14.8	9.4	4.3	0.05977	1.11993			
Propyl acetate	$C_5H_{10}O_2$	32.9	29.8	26.8	24.4	21.0	15.5	10.3	5.5	0.06223	1.22645			
Methyl propionate	$C_4H_8O_2$	34.1	30.8	27.5	25.0	21.2	15.3	9.6	4.5	0.06560	1.20059			
Ethyl propionate	$C_5H_{10}O_2$	32.9	29.8	26.7	24.3	20.8	15.2	10.0	5.2	0.06295	1.23411			
Propyl propionate	$C_6H_{12}O_2$	32.5	29.7	26.9	24.7	21.5	16.4	11.5	6.9	0.05922	1.20436			
Methyl butyrate	$C_5H_{10}O_2$	33.7	30.6	27.5	25.1	21.7	16.1	10.8	6.0	0.06334	1.22797			
Ethyl butyrate	$C_6H_{12}O_2$	32.1	29.3	26.6	24.5	21.3	16.3	11.5	7.0	0.05815	1.20103			
Methyl benzoate	$C_8H_8O_2$			40.3	37.9	34.3	28.5	22.9	17.6	0.07654	1.27952			
Ethyl benzoate	$C_9H_{10}O_2$		40.0	37.3	35.2	32.1	27.0	22.1	17.4	0.06785	1.20294			
Methyl salicylate	$C_8H_8O_3$			43.1	40.7	37.0	31.1	25.4	20.0	0.07943	1.25423			
Amines														
Methyl amine	CH_5N	34.2	29.1	24.1	20.3	14.9	6.8			0.08559	1.25562			

Ethyl amine	C_2H_7N	31.5	27.2	23.1	19.9	15.4	8.4	2.6		0.07421	1.27662			
Propyl amine	C_3H_9N	31.7	28.2	24.8	22.0	18.1	11.9	6.3	1.6	0.06625	1.23432			
n-Butyl amine	$C_6H_{15}N$		29.7	26.6	24.2	20.7	15.0	9.6	4.6	0.06231	1.17982			
Dimethyl amine	C_2H_7N	26.8	23.3	19.9	17.1	13.2	6.9	1.2		0.06007	1.12956			
Trimethyl amine	C_3H_9N	23.0	19.6	16.4	13.9	10.3	4.8			0.05664	1.24654			
Diethyl amine	$C_6H_{15}N$		25.3	22.5	20.3	17.0	11.7	6.6	1.9	0.05398	1.09669			
Triethyl amine	$C_6H_{15}N$	28.2	25.5	22.8	20.8	17.7	12.8	8.2	4.0	0.05414	1.20778			
Piperidine	$C_5H_{11}N$			31.9	29.5	26.0	20.3	14.9	9.8	0.06712	1.20830			
Pyridine	C_6H_7N		43.7	40.2	37.4	33.3	26.6	20.2	14.1	0.08141	1.21501			
Aniline	C_6H_7N			45.3	43.0	39.5	33.9	28.3	22.8	0.07730	1.08060			
N-methyl aniline	C_7H_9N	47.7	44.9	42.0	39.8	36.5	31.0	25.7	20.5	0.07391	1.14353			
N,N-dimethyl aniline	$C_8H_{11}N$				36.4	33.1	27.7	22.5	17.5	0.07084	1.19971			
N,N-diethyl aniline	$C_{10}H_{15}N$		39.0	36.4	34.3	31.2	26.1	21.3	16.6	0.06723	1.24697			
Phenylhydrazine	$C_6H_8N_2$				45.5	41.7	35.6	29.7	24.1	0.08574	1.30394			
Diphenyl amine	$C_{12}H_{11}N$						35.2	30.0	25.1	0.07841	1.31441			
Nitriles														
Acetonitrile	C_2H_3N		35.1	31.9	29.3	25.5	19.3	13.2	7.4	0.06835	1.09864			
Propionitrile	C_3H_5N	35.3	32.4	29.5	27.2	23.8	18.3	13.0	7.9	0.06264	1.13719			
Butyronitrile	C_4H_7N	34.9	32.2	29.6	27.5	24.3	19.2	14.2	9.4	0.05959	1.10579			
Benzonitrile	C_7H_5N			41.4	39.1	35.7	30.1	24.7	19.5	0.07466	1.19036			
Amides														
Formamide	CH_3NO				58.2	55.5	50.8			0.08328	0.74835			
Nitroderivates														
Nitromethane	CH_3NO_2		43.9	40.1	37.1	32.6	25.4	18.5	12.0	0.08458	1.19508			
Nitrobenzene	$C_6H_5NO_2$				43.8	40.3	34.6	29.0	23.5	0.07946	1.13667			
o-Nitrotoluene	$C_7H_7NO_2$			43.7	41.4	38.0	32.4	27.0	21.7	0.07678	1.17965			
m-Nitrotoluene	$C_7H_7NO_2$				41.1	37.7	32.2	26.9	21.7	0.07641	1.21693			
p-Nitrotoluene	$C_7H_7NO_2$						32.3	27.2	22.3	0.07341	1.17727			

D3.2 Properties at Saturation

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The tables in this chapter contain values of thermal, caloric, and transport properties of the saturated liquid and vapor of the corresponding fluids. Originally, these tables were adapted from the Heat Exchanger Design Handbook (*R. N. Maddox*, Hemisphere Publishing Corporation, 1983). However, most tables were recalculated by now. References are included to enable access to more detailed information. An alphabetic list of references is given at the end of Subchap. D3.2.

At a given temperature, properties of the saturated vapor (except for the saturated vapor density) can be used for the homogeneous gas region as a first-order approximation. In the same sense, data for the saturated liquid can be used for the homogeneous liquid at a given temperature. However, when approaching the critical temperature this approximation results in an increasing systematic error. Wherever possible, the cited equations of state should be used to directly calculate properties at homogeneous states.

Since critical parameters are required for many relations used to calculate properties on the phase boundary and since they are important parameters of the correlations used to calculate the given tables, values of the critical temperature, T_c, the critical pressure, p_c, and the critical density, ρ_c, are given for each of the fluids. The values given in this chapter are parameters of the used correlations and are as such independent of the values reported in Chap. D1.

The following properties are reported in the tables of this section:

T_s	Saturation temperature in K
p_s	Vapor pressure in kPa
h	Specific enthalpy in kJ/kg
Δh_v	Specific enthalpy of evaporation in kJ/kg
c_p	Specific isobaric heat capacity in kJ/(kg K)
η	Dynamic viscosity in kg/(m s)
λ	Thermal conductivity in W/(m K)
Pr	Prandtl number
σ	Surface tension in N/m
β'	volumetric expansion coefficient of the liquid in K^{-1} with $\beta' = \frac{(v_2 - v_1)}{v_1(T_2 - T_1)}$

Properties marked with $'$ denote saturated liquid states. Properties marked with $''$ denote saturated vapor states.

In most cases, "typical" uncertainties exist for properties of the saturated liquid or of the saturated vapor at temperatures ranging from the normal-boiling temperature to about 90% of the critical temperature. In most cases, the uncertainty of all properties except for the vapor pressure significantly increases at temperatures above 90% of the critical temperature. Between triple-point temperature and normal-boiling temperature particularly, relative uncertainties of vapor pressure and saturated vapor density increase. However, depending on the data situation the uncertainty of properties may very well vary significantly with temperature even in the range where by principle no problems would be expected. Thus, reducing a discussion of uncertainties to a single value always is a critical simplification. On the other hand, information on the uncertainty of properties is essential for the user. Therefore, it has been tried to characterize the "typical" relative uncertainty of the data presented in the tables by classifying them into groups a to f:

a	$\Delta y/y \leq \pm 0.2\%$
b	$\Delta y/y \leq \pm 0.5\%$
c	$\Delta y/y \leq \pm 1\%$
d	$\Delta y/y \leq \pm 2\%$
e	$\Delta y/y \leq \pm 5\%$
f	$\Delta y/y \leq \pm 10\%$
g	$\Delta y/y > \pm 10\%$
h	Insufficient information for classification

Typically, the category h is found where data were adapted from other compilations.

Interpolation between the values given in the tables is permitted. However, due to large temperature steps in the tables simple linear interpolation may result in errors up to 10% even at moderate temperatures sufficiently far away from the critical temperature. The magnitude of the error caused by interpolation strongly depends on the algorithm used for interpolation and on characteristics of the property. Based on the general formula for interpolation,

$$y = y_1 + \frac{\tau - \tau_1}{\tau_2 - \tau_1}\,(y_2 - y_1),$$

we recommend the following algorithms.

Linear interpolation over temperature ($\tau = T$) for enthalpies of the saturated liquid ($y = h'$) and the saturated vapor ($y = h''$) and for the thermal conductivity of the saturated liquid ($y = \lambda'$).

Linear interpolation in the logarithmic distance to the critical temperature ($\tau = \ln(T_c - T)$) for the dynamic viscosity ($y = \eta''$) and the thermal conductivity ($y = \lambda''$) of the saturated vapor.

Tables are given for the following fluids:

Logarithmic interpolation in the logarithmic distance to the critical temperature ($\tau = \ln(T_c - T)$) for the saturated liquid density ($y = \ln(\rho')$), the enthalpy of evaporation ($y = \ln(\Delta h_v)$), the isobaric heat capacity of the saturated liquid ($y = \ln(c_p')$) and the saturated vapor ($y = \ln(c_p'')$), the Prandtl number of the saturated liquid ($y = \ln(\mathrm{Pr}')$) and of the saturated vapor ($y = \ln(\mathrm{Pr}'')$), the surface tension ($y = \ln(\sigma)$) and the volumetric expansion coefficient of the liquid ($y = \ln(\beta')$).

Linear interpolation in the inverse temperature ($\tau = T^{-1}$) for the dynamic viscosity of the saturated liquid ($y = \eta'$).

Logarithmic interpolation in the inverse temperature ($\tau = T^{-1}$) for the vapor pressure ($y = \ln(p_s)$) and the saturated vapor density ($y = \ln(\rho'')$).

Even when these algorithms are used, additional uncertainties between ±0.2% and ±1% have to be considered for interpolated values. This becomes particularly relevant for properties with the uncertainty class a or b – the "typical" uncertainties given in the tables do not include errors due to interpolation. Interpolation errors up to ±3% occur for the Prandtl number of the saturated vapor. Interpolation between the last two columns of the table (for temperatures close to the critical temperature) may result in significantly larger errors.

Normal Hydrogen H_2 (T_c = 33.15 K, p_c = 1.296 MPa, ρ_c = 31.26 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
20.37	101.33	70.85	1.332	0.00	448.7	448.70	9.772	12.036	12.7	1.1	119	16.3	1.04	0.83	1.92	16.68
21	121.5	70.12	1.570	6.47	451.97	445.50	10.137	12.311	12.0	1.2	121	16.9	1.01	0.85	1.81	17.61
23	204.38	67.59	2.533	28.72	459.87	431.15	11.489	13.471	10.5	1.3	126	19.2	0.96	0.91	1.47	21.24
25	321.00	64.70	3.894	54.16	463.36	409.20	13.297	15.289	9.1	1.4	127	22	0.95	0.99	1.13	26.57
27	477.89	61.31	5.806	83.72	461.17	377.45	15.987	18.357	7.8	1.6	122	25	1.03	1.15	0.796	35.35
29	682.05	57.12	8.560	119.19	450.91	331.71	20.807	24.444	6.8	1.7	112	29	1.26	1.47	0.483	52.82
30	804.32	54.54	10.44	140.29	441.18	300.88	25.284	30.424	6.3	1.9	106	31	1.50	1.83	0.333	70.28
31	941.65	51.38	12.91	165.07	426.40	261.33	33.758	42.068	5.7	2.0	100	35	1.91	2.40	0.207	105.2
32	1095.7	47.09	16.50	196.72	402.29	205.56	57.285	74.634	5.0	2.2	91	40	3.15	4.09	0.106	208.3
33.15	1296.4	31.26	31.26	298.15	298.15				3.4	3.4	60	60				
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[1]	h[1]	h[2]	h[2]	h[3]	h[3]	h[1]	d[1]

[1]Ref. [51]; [2]Ref. [117]; [3]Calc. from other properties.

Argon Ar (T_c = 150.69 K, p_c = 4.863 MPa, ρ_c = 535.6 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h$'$, kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
83.81	68.89	1416.8	4.055	−121.44	42.28	163.72	1.116	0.555	290.2	6.86	133.63	5.36	2.42	0.71	13.42	4.294
87.3	101.33	1395.4	5.774	−117.52	43.62	161.14	1.117	0.566	260.3	7.17	128.46	5.62	2.26	0.721	12.53	4.443
90	133.51	1378.6	7.436	−114.49	44.57	159.06	1.121	0.576	240	7.41	124.51	5.83	2.16	0.731	11.85	4.575
100	323.77	1313.7	16.86	−103.06	47.4	150.46	1.154	0.627	181.3	8.35	110.22	6.69	1.9	0.782	9.42	5.222
110	665.26	1242.8	33.29	−91.13	48.84	139.97	1.218	0.712	140.4	9.37	96.41	7.73	1.77	0.863	7.11	6.219
120	1213	1162.8	60.14	−78.35	48.41	126.77	1.332	0.863	110.2	10.54	83.13	9.15	1.77	0.993	4.96	7.886
130	2025.5	1068.1	103.56	−64.16	45.3	109.46	1.564	1.172	85.9	12.03	70.43	11.45	1.91	1.23	3	11.2
140	3168.2	943.7	178.86	−47.16	37.47	84.63	2.225	2.104	63.6	14.32	58.06	16.39	2.44	1.84	1.29	21.01
145	3889.6	854.3	244.44	−36.19	29.76	65.95	3.399	3.896	52.1	16.27	52.01	22.53	3.4	2.81	0.58	39.75
150.69	4863	535.6	535.6	−4.33	−4.33											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	b[1]	b[1]	c[2]	c[2]	d[2]	d[2]	d[3]	d[3]	d[4]	b[1]

[1]Ref. [111]; [2]Ref. [54]; [3]Calc. from other properties; [4]Ref. [57].

Neon Ne (T_c = 44.49 K, p_c = 2.679 MPa, ρ_c = 481.9 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
27.11	101.34	1206.95	9.579	0	85.75	85.75	1.862	1.415	127	4.6	113	7.7	2.09	0.85	4.78	14.56
29	172.87	1172.99	15.647	3.63	86.96	83.32	1.948	1.306	105	5	110	8.5	1.86	0.77	4.15	16.129
31	283.24	1134.02	24.803	7.7	87.79	80.09	2.079	1.347	92.5	5.4	108	9.3	1.78	0.79	3.5	18.499
33	437.82	1091.23	37.584	12.05	88.18	76.13	2.22	1.469	77.9	5.8	102	10.2	1.7	0.84	1.87	21.425
35	645.43	1044.24	55.106	16.69	88.04	71.35	2.384	1.669	65.9	6.1	96.5	11.1	1.63	0.92	2.26	25.243
37	915.4	992.03	79.087	21.67	87.22	65.55	2.625	1.994	56.6	6.8	88.6	12.4	1.68	1.1	1.69	30.959
39	1258.1	932	112.575	27.18	85.48	58.3	3.059	2.584	47.3	7.4	78.9	13.9	1.83	1.38	1.15	41.31
41	1685.5	857.03	162.165	33.62	82.25	48.63	4.089	3.916	38.6	8.5	67.3	16	2.35	2.07	0.65	66.81
43	2212.1	739.37	248.26	42.54	75.96	33.42	8.761	9.132	27.8	11.9	50.3	22.8	4.84	4.77	0.2	195.49
44.49	2678.6	481.91	481.91	59.46	59.46				16.7	16.7	33	33				
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[1,2]	h[2]	h[3]	h[3]	h[5]	h[5]	h[1,4]	d[1]

[1]Ref. [44]; [2]Ref. [121]; [3]Ref. [118]; [4]Ref. [73]; [5]Calc. from other properties.

Chlorine Cl (T_c = 416.92 K, p_c = 7.9914 MPa, ρ_c = 576.8 kg/m^3)

T_s, K	P_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
172.18	1.39	1743.2	0.07	−380.8	−57.9	322.9	1.03	0.44	1256	7.9	196.8	4.3	6.57	0.82	39.9	
195	8.73	1677.6	0.38	−358.5	−47.9	310.6	0.94	0.44	788.5	9	186.9	5	3.97	0.79	35	1.59
217	34.07	1620.3	1.35	−338	−38.4	299.6	0.93	0.45	552.1	10	176.7	5.7	2.91	0.79	30.6	1.59
139.17	101.33	1562.5	3.7	−317.4	−29.3	288.1	0.94	0.46	411.9	11.1	165.7	6.5	2.34	0.78	26.3	1.7
267	299.85	1486.3	10.1	−290.9	−19.1	271.8	0.97	0.49	305.5	12.4	151.1	7.7	1.96	0.75	21.2	1.92
296	733.88	1400.2	23.5	−262	−10.8	251.2	1	0.53	232.4	13.9	134.9	9.1	1.72	0.81	16.3	2.25
324	1482.8	1308.6	46.7	−233.2	−6.1	227.1	1.04	0.6	181	15.5	118.1	10.7	1.59	0.87	11.9	2.73
352	2675.9	1204.8	86.3	−203.1	−6	197.1	1.12	0.75	141.4	17.4	100.4	12.7	1.58	1.03	8	3.59
380	4447.6	1077.2	156.2	−170.2	−13.2	157	1.36	1.12	108	20.4	81.7	15.6	1.8	1.46	4.3	5.79
408.6	7040.5	858.4	322.3	−124.9	−39.5	85.4	3.62	3.97	71.8	28.8	61.5	51.9	4.22	5.12	0.9	23.97
Uncertainty	c[1]	c[1]	e[1]	e[1]	e[1]	e[1]	e[1]	e[1]	g[2,6]	f[2,6]	g[3,6]	g[4,6]	g[7]	g[7]	g[5,6]	e[1]

[1]Ref. [2]; [2]Ref. [14]; [3]Ref. [68]; [4]Ref. [108]; [5]Ref. [41]; [6]Estimated values; [7]Calc. from other properties.

Fluorine F2 (T_c = 144.41 K, p_c = 5.172 MPa, ρ_c = 592.9 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
53.49	0.24	1706.7	0.02	−46.79	152.27	199.06	1.525	0.767	854.8	4.4	205.7	4.1	6.34	0.82	22.7	3.887
64	3.74	1640.3	0.268	−31.36	160.19	191.55	1.475	0.771	499.6	5.2	192.4	5	3.83	0.8	20	3.831
74	23.22	1576.4	1.452	−16.55	167.35	183.9	1.485	0.787	332.4	6.1	178.8	6	2.76	0.8	16.6	4.151
85.04	101.32	1501.8	5.641	0	174.37	174.37	1.511	0.825	231.7	7	162.8	7.1	2.15	0.81	13.6	4.691
92	210.8	1451.6	11.1	10.65	178.11	167.45	1.539	0.864	190.2	7.6	151.8	7.9	1.93	0.83	11.7	5.158
102	500.9	1373.8	24.96	26.41	182.29	155.88	1.6	0.946	147.7	8.5	135.4	9.3	1.75	0.86	9.2	6.081
112	1012.9	1286.9	49.27	42.99	184.73	141.73	1.705	1.076	116.5	9.6	118	10.9	1.68	0.95	6.8	7.549
122	1824.4	1185.5	90.14	60.92	184.6	123.69	1.914	1.328	91.4	10.9	99.7	13	1.75	1.11	4.5	10.384
132	3023	1054.7	162	81.51	179.9	98.39	2.483	2.061	68.8	13.1	80.3	16.1	2.13	1.68	2.4	18.31
144.41	5172.4	592.9	592.9	133.13	133.13				45.6	17.8	61.2	22.5			0.55	
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	e[2]	f[3,8]	g[4,8]	g[5,8]	h[9]	h[9]	g[6,7,8]	d[1]

[1]Ref. [90]; [2]Ref. [34]; [3]Ref. [14]; [4]Ref. [68]; [5]Ref. [108]; [6]Ref. [19]; [7]Ref. [38]; [8]Estimated values; [9]Calc. from other properties.

Mercury Hg (T_c = 1763.2 K, p_c = 151.00 MPa, ρ_c = 5500 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p' kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
630.1	101.3	12737	3.91	91.8	386.7	294.9	0.136	0.104	884	61.7	121.9	10.4	0.987	0.617		0.194
650	145	12688	5.37	94.5	388.7	294.2	0.136	0.104	870	63.5	123.6	10.8	0.957	0.612		0.192
700	316	12567	10.9	101.3	393.6	292.3	0.137	0.105	841	68.6	128	11.7	0.9	0.616		0.192
750	620	12444	20.1	108.2	398.4	290.2	0.138	0.106	816	73.5	131.9	12.6	0.854	0.618		0.198
800	1120	12318	34.2	115.2	403	287.8	0.14	0.107	794	78.4	135.1	13.5	0.823	0.621		0.205
850	1880	12190	54.6	122.3	407.4	285.1	0.142	0.108	776	83.5	137.8	14.4	0.8	0.626		0.212
900	2990	12059	82.7	129.5	411.6	282.1	0.144	0.109	760	88.4	141.8	15.3	0.772	0.63		0.218
950	4530	11927	119.9	136.9	415.5	278.6	0.146	0.111	746	93.2	144.5	16.2	0.754	0.637		0.226
1000	6580	11791	167.7	144.4	419.1	274.7	0.149	0.113	736	98	146.9	17.2	0.744	0.644		0.234
1050	9230	11650	227.3	153.8	423	269.2	0.153	0.116	723	103	147.9	18.1	0.748	0.66		0.246
Uncertainty	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1,2]	h[1]	h[4]	h[4]		h[3]

[1]Ref. [125]; [2]Ref. [119]; [3]Estimated values; [4]Calc. from other properties.

Hydrogen fluoride HF (T_c = 461.15 K, p_c = 6.485 MPa, ρ_c = 290 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
292.69	101.3	968	2	0	330	330	3.04	1.46	215	10.9	402	21	1.63	0.76	8.65	1.93
305	152	945	3.5	37.9	407.9	370	3.12	1.46	191	12.2	387	21.8	1.54	0.82	7.85	2.08
325	285	905	5	101.6	536.6	435	3.26	1.46	161	13.5	362	23	1.45	0.85	6.75	2.29
345	500	862	10	168	653	485	3.44	1.46	139	14.5	335	24.3	1.43	0.87	5.6	2.59
365	820	816	14	239	769	530	3.68	1.46	121	15.4	310	25.6	1.44	0.88	4.6	2.91
385	1320	765	20	316	896	580	4	1.46	106	16.3	283	26.9	1.5	0.88	3.5	3.48
405	2100	710	28	400	1010	610	4.41	1.46	93	17.2	255	28.3	1.61	0.88	2.5	4.46
425	3150	640	45	493	1068	574	4.92	1.46	81.6	18.1	227	29.6	1.77	0.89	1.6	6.6
445	4800	545	88	598	993	395	5.56	1.46	71.2	18.9	199	30.9	1.99	0.89	0.7	15.54
461.15	6490	290	290						39.8	39.8		32	2.22			
Uncertainty	h[1]	h[1]	h[1]	h[11]	h[11]	h[2]	h[3]	h[4]	h[8,1]	h[9,1]	h[5,1]	h[6,1]	h[11]	h[11]	h[7]	h[10]

[1]Ref. [37]; [2]Ref. [29]; [3]Ref. [67]; [4]Ref. [6]; [5]Ref. [68]; [6]Ref. [69]; [7]Ref. [73]; [8]Ref. [71]; [9]Ref. [70]; [10]Estimated values; [11]Calc. from other properties.

Hydrogen chloride HCl (T_c = 324.6 K, p_c = 8.309 MPa, ρ_c = 450 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
188.05	101.3	1190	2.5	0	442	442	1.61	0.85	407	9	337	8.6	1.94	0.89	23.2	2.31
200	180	1155	5	20	452	432	1.66	0.87	332	9.6	323	9.3	1.71	0.9	21	2.42
215	370	1115	10	45	461	416	1.74	0.91	259	10.4	305	10.5	1.48	0.9	18.3	2.55
230	670	1070	15	71	467	396	1.84	0.96	204	11.2	285	12	1.32	0.9	15.5	2.97
245	1100	1020	25	99	473	374	1.95	1.04	160	12.1	264	13.5	1.18	0.93	12.9	3.27
260	1800	970	40	130	478	348	2.15	1.16	126	13	242	15.6	1.12	0.97	10.2	3.26
275	2700	925	55	164	480	316	2.34	1.36	101	14.1	219	17.8	1.08	1.06	7.7	4.59
290	3800	845	90	203	478	275	2.67	1.74	77	15.1	195	21.6	1.05	1.22	5.2	6.78
305	5500	755	140	247	465	218	3.28	2.74	60	16.8	169	26.9	1.16	1.71	2.8	19.38
324.6	8309	450	450						34	34	61	61				
Uncertainty	h[1]	h[1]	h[1]	h[11]	h[12]	h[2]	h[3,4]	h[5,6]	h[11,1]	h[12,1,7]	h[8,1]	h[9,13]	h[15]	h[15]	h[10]	h[14]

[1]Ref. [37]; [2]Ref. [29]; [3]Ref. [67]; [4]Ref. [63]; [5]Ref. [6]; [6]Ref. [52]; [7]Ref. [107]; [8]Ref. [68]; [9]Ref. [69]; [10]Ref. [73]; [11]Ref. [71]; [12]Ref. [70]; [13]Ref. [108]; [14]Estimated values; [15]Calc. from other properties.

Hydrogen sulfide H_2S (T_c = 373.15 K, p_c = 8.937 MPa, ρ_c = 346 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
212.8	101.3	965	2	−356	199	555	1.83	1.02	423	9.2	233	9.1	3.32	1.03	29	1.86
220	140	955	2.6	−341	204	545	1.85	1.03	378	9.6	224	9.6	3.12	1.03	27.5	1.96
240	325	915	5.5	−301	219	520	1.91	1.08	272	10.5	199	11.1	2.61	1.02	23.5	2.19
260	680	875	11	−256	230	485	2	1.16	205	11.4	175	12.9	2.34	1.03	19.6	2.44
280	1200	830	21	−207	239	445	2.13	1.28	162	12.4	153	14.7	2.26	1.08	16	2.87
300	2000	780	35	−161	244	405	2.35	1.45	130	13.5	131	17	2.33	1.15	12.5	3.56
320	3250	720	55	−104	241	345	2.64	1.77	110	14.8	107	19.8	2.71	1.32	9.2	4.55
340	4890	650	95	−42	228	270	3.1	2.48	87	16.5	85	24.1	3.17	1.7	5.5	6.06
360	7050	565	160	45	190	145	4.38	6.45	66	19.2	62	30.5	4.66	4.06	2.2	18.66
373.15	8937	346	346	68	68				40.5	40.5	49.5	49.5				
Uncertainty	h[1]	h[2]	h[1]	h[9]	h[3,4]	h[1]	h[5]	h[1,3,4]	h[1,6]	h[1,7]	h[1,8]	h[1,8]	h[10]	h[10]	h[1]	h[9]

[1]Refs. [121]; [2]Ref. [37]; [3]Ref. [115]; [4]Ref. [52]; [5]Ref. [63]; [6]Ref. [59]; [7]Ref. [107]; [8]Ref. [108]; [9]Estimated values; [10]Calc. from other properties.

Ammonia NH_3 (T_c = 405.5 K, p_c = 11.353 MPa, ρ_c = 234.7 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h,′ kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
195.5	60.9	732.9	0.064	−143.1	1341.2	1484.3	4.202	2.063	559	6.84					43.9	
239.75	101	682.1	0.886	48.4	1418.2	1369.8	4.448	2.296	256.4	8.05	613.7	17.53	1.86	1.05	33.9	1.76
270	381	642.9	3.087	185.45	1458.8	1273.4	4.599	2.634	176.1	8.96	544.3	21.34	1.49	1.11	26.9	2.17
290	774	614.8	6.074	278.8	1477.8	1199	4.722	2.967	142.7	9.58	499.6	24.78	1.35	1.15	22.4	2.63
310	1424	584.5	11.019	375.1	1489	1112.9	4.897	3.423	117.5	10.22	454.9	28.67	1.26	1.22	18	3.11
330	2421	550.9	18.983	475.6	1490.2	1014.6	5.176	4.078	97.32	10.93	409.8	33.19	1.23	1.34	13.7	4.03
350	3866	512.4	31.334	582.6	1477.9	895.3	5.671	5.125	80.43	11.79	364.3	39.14	1.25	1.54	9.6	5.36
370	5878	465.3	51.729	700.8	1444.7	743.9	6.715	7.214	65.49	13.05	318.7	48.2	1.38	1.95	5.74	8.3
390	8605	399.6	90.224	842.75	1369.9	527.15	10.305	14.192	50.88	15.53	273.4	64.74	1.92	3.4	2.21	17.63
400	10305	344.6	131.09	941.86	1288.8	346.94	22.728	34.924	42.02	18.45	251.2	81.52	3.8	7.9	0.68	41.72
Uncertainty	a[1]	a[1]	b[1]	b[1]	b[1]	b[1]	c[1]	c[1]	c[2]	c[2]	e[3,4,5,6]	e[7]	f[11]	f[11]	d[8,9]	h[10]

[1]Ref. [112]; [2]Ref. [131]; [3]Ref. [124]; [4]Ref. [121]; [5]Ref. [76]; [6]Ref. [95]; [7]Ref. [1]; [8]Ref. [104]; [9]Ref. [72]; [10]Estimated values; [11]Calc. from other properties.

Carbon monoxide CO (T_c = 132.86 K, p_c = 3.494 MPa, ρ_c = 303.9 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
81.66	101.58	793.12	4.371	0.05	214.7	214.65	2.146	1.132	154	7.1	141	6.9	2.34	1.16	9.47	5.544
90	238.52	755.35	9.66	18.18	220.39	202.22	2.188	1.216	120	7.5	125	8.2	2.1	1.11	7.73	6.33
95	368.6	731.15	14.568	29.3	223.03	193.73	2.236	1.29	105	7.8	116	8.9	2.02	1.13	6.71	6.978
100	544.38	705.41	21.204	40.71	224.95	184.24	2.306	1.389	93.5	8.1	107	9.7	2.02	1.16	5.71	7.828
105	774.17	677.71	30.038	52.52	226	173.47	2.408	1.526	83.9	8.4	98.2	10.5	2.06	1.23	4.73	8.984
110	1066.6	647.44	41.743	64.89	225.97	161.09	2.558	1.725	75.9	8.8	89.3	11.5	2.17	1.32	3.78	10.642
115	1430.7	613.63	57.368	78.02	224.56	146.54	2.793	2.039	69.1	9.2	80.3	12.6	2.4	1.49	2.86	13.21
120	1876.5	574.58	78.772	92.3	221.2	128.9	3.202	2.601	63.3	9.8	71.4	14	2.84	1.82	1.97	17.76
125	2415.7	526.53	109.99	108.5	214.7	106.21	4.1	3.898	58.3	11.7	62.5	18.4	3.82	2.48	1.13	28.14
132.86	3494	303.91	303.91	164.71	164.71											
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[2]	h[3,4]	h[5]	h[5,6]	h[8]	h[8]	h[7]	d[1]

[1]Ref. [58]; [2]Ref. [71]; [3]Ref. [70]; [4]Ref. [107]; [5]Ref. [118]; [6]Ref. [108]; [7]Ref. [73]; [8]Calc. from other properties.

R22 $CHClF_2$ (T_c = 369.3 K, p_c = 4.990 MPa, ρ_c = 523.8 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
115.73	0.000379	1721.3	0.000034	29.6	332.71	303.11	1.075	0.425	13435.3	4.88	177.01	2.59	81.61	0.8	38.56	1.53
200	16.67	1499.7	0.875	119.22	372.15	252.93	1.064	0.539	544	8.37	129.11	5.54	4.48	0.814	23.46	1.809
225	70.91	1430.3	3.371	146.03	384.3	238.27	1.081	0.589	379.4	9.4	116.85	6.68	3.51	0.828	19.27	2.001
232.34	101.33	1409.2	4.704	154	387.75	233.75	1.09	0.606	345.4	9.7	113.37	7.05	3.32	0.834	18.08	2.074
250	216.9	1356.3	9.605	173.51	395.71	222.2	1.117	0.655	279.6	10.41	105.22	7.99	2.97	0.854	15.25	2.292
275	528.65	1275.2	22.5	202.17	405.72	203.55	1.174	0.747	211.7	11.44	93.91	9.53	2.65	0.897	11.42	2.742
300	1097	1183.4	46.54	232.62	413.5	180.88	1.265	0.885	161	12.61	82.64	11.51	2.47	0.97	7.82	3.51
325	2026.4	1073.2	90.19	265.84	417.55	151.71	1.438	1.139	120.1	14.21	71.01	14.52	2.43	1.11	4.51	5.155
350	3442.7	920.1	177.54	304.7	413.7	109	1.996	1.956	83.1	17.33	58.3	21.29	2.85	1.59	1.62	11.35
369.3	4990	523.8	523.8	366.9	366.9											
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	e[2]	e[2]	e[3]	e[3]	e[4]	e[4]	f[5]	b[1]

[1]Ref. [43]; [2]Ref. [45]; [3]Ref. [66]; [4]Calc. from other properties; [5]Ref. [79].

R123 $C_2HCl_2F_3$ (T_c = 456,83 K, p_c = 3.662 MPa, ρ_c = 550 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
166	0	1771	0.0005	98.811	322.5	223.69	0.929	0.474	7170	5.57	113.83	4.99	58.52	0.53	32.07	
210	0.62	1672.1	0.054	139.52	344.95	205.42	0.93	0.548	1690.6	7.39	101.92	6.61	15.43	0.61	26.19	1.333
255	13.27	1569.4	0.967	182.21	370.61	188.41	0.97	0.62	729.19	9.17	89.73	8.42	7.88	0.68	20.43	1.495
301	101.3	1456.6	6.471	228.03	398.22	170.19	1.023	0.701	405.78	10.89	77.05	10.5	5.38	0.72	14.84	1.771
325	224.8	1392.7	13.752	253.01	412.6	159.59	1.054	0.749	313.9	11.65	70.36	11.74	4.7	0.74	12.07	1.989
350	451.5	1320.8	26.977	279.89	427.12	147.23	1.094	0.808	244.14	12.58	63.41	13.19	4.21	0.77	9.31	2.322
375	818.5	1240.6	49.027	307.89	440.74	132.85	1.148	0.885	190.27	13.73	56.46	14.89	3.87	0.82	6.7	2.866
400	1372	1146.8	85.321	337.45	452.74	115.3	1.237	1.004	145.85	15.33	49.51	16.96	3.64	0.91	4.27	3.907
425	2167	1026.4	148.41	369.63	461.53	91.897	1.438	1.273	106.17	17.96	42.56	19.71	3.59	1.16	2.08	6.604
447	3126	857.44	265.82	403.31	461.79	58.478	2.34	2.55	71.78	23.28	36.44	23.06	4.61	2.57	0.49	19.644
Uncertainty	a[1]	a[1]	d[1]	d[1]	d[1]	d[1]	d[1]	d[1]	f[2]	f[3]	f[4,5]	f[6]	g[8]	g[8]	e[7]	c[1]

[1]Ref. [136]; [2]Ref. [80]; [3]Ref. [75]; [4]Ref. [31]; [5]Ref. [123]; [6]Ref. [133]; [7]Ref. [77]; [8]Calc. from other properties.

R125 C_2HF_5 (T_c = 339.17 K, p_c = 3.618 MPa, ρ_c = 573.6 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
172.52	2.914	1690.7	0.2446	87.13	277.39	190.26	1.035	0.569	1152.4	7.43	116.02	5.23	10.28	0.81	21.79	1.906
200	24.6	1600.5	1.804	115.98	293.01	177.02	1.069	0.631	631	8.63	103.06	7.04	6.54	0.774	17.43	2.101
225.06	101.32	1513.6	6.79	143.34	307.44	164.1	1.115	0.697	411.1	9.71	91.3	8.75	5.02	0.774	13.63	2.391
240	200.04	1458.2	12.918	160.26	315.87	155.6	1.149	0.744	327.4	10.35	84.44	9.81	4.45	0.785	11.45	2.643
260	432.5	1378	27.179	183.82	326.63	142.8	1.205	0.819	245.4	11.25	75.52	11.36	3.92	0.811	8.66	3.14
280	827.82	1287.2	52.22	208.69	336.3	127.6	1.286	0.919	184.7	12.27	66.94	13.17	3.55	0.856	6.04	3.991
300	1446.3	1178.2	95.71	235.45	343.83	108.38	1.425	1.104	136.9	13.64	58.67	15.68	3.32	0.961	3.62	5.741
320	2360	1031.3	177.36	265.53	347.03	81.5	1.783	1.643	95.6	16.1	50.53	20.57	3.37	1.29	1.49	11.184
330	2957.9	921.1	255.28	283.42	344.56	61.13	2.468	2.736	74.6	18.77	46.66	26.61	3.95	1.93	0.6	23.14
339.17	3617.7	573.6	573.6	318.06	318.06											
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	c[1]	c[1]	e[2]	e[2]	e[3]	e[3]	e[4]	e[4]	f[5]	b[1]

[1]Ref. [55]; [2]Ref. [39], [3] Ref. [85]; [4]Calc. from other properties; [5]Ref. [78].

R134a $C_2H_2F_4$ (T_c = 374.18 K, p_c = 4.056 MPa, ρ_c = 508 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
169.85	0.39	1591.1	0.0282	71.45	334.94	263.49	1.18	0.585	1152	6.5	141	2.34	9.65	1.63	28.07	
195	4.27	1524	0.27	101.38	349.96	248.58	1.2	0.646	749	7.63	129	4.76	6.95	1.03	23.79	1.77
220	24.43	1455.2	1.39	131.78	365.65	233.87	1.23	0.711	521	8.73	118	7.08	5.47	0.876	19.69	1.93
246.78	100	1377.6	5.19	165.43	382.59	217.16	1.28	0.793	368	9.89	105	9.49	4.47	0.827	15.48	2.18
265	215.67	1321.2	10.76	189.14	393.78	204.64	1.32	0.862	294	10.67	97.3	11.2	3.99	0.821	12.75	2.43
285	440.83	1254.5	21.48	216.12	405.35	189.23	1.38	0.955	231	11.54	88.4	13.1	3.59	0.841	9.88	2.83
305	811.97	1180.2	39.63	244.4	415.71	171.31	1.46	1.08	181	12.47	79.4	15.22	3.31	0.885	7.17	3.47
325	1380.3	1093.6	69.76	274.51	424.1	149.59	1.58	1.27	139	13.59	70.2	17.82	3.14	0.967	4.67	4.65
345	2205.9	984.7	121.84	307.51	428.85	121.34	1.84	1.66	104	15.23	60.8	21.62	3.13	1.17	2.42	7.43
365	3369.1	816.3	232.9	347.23	424.04	76.81	3.04	3.58	68.7	19.21	52.2	31.02	4	2.22	0.565	21.55
Uncertainty	a[1]	a[1]	d[1]	d[1]	d[1]	d[1]	c[1]	c[1]	f[2]	f[2]	e[2]	f[2]	f[4]	f[4]	e[3]	c[4]

[1]Ref. [114]; [2]Ref. [47]; [3]Ref. [77]; [4]Calc. from other properties.

R152a $C_2H_4F_2$ (T_c = 386.41 K, p_c = 4.517 MPa, ρ_c = 368 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(ms)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
154.56	0.07	1190.3	0.003	14.26	417.09	402.83	1.472	0.727	1935.2	9.02	171.33	2.62	16.63	2.51	31.65	
190	2.78	1125.8	0.117	66.99	443.85	376.86	1.511	0.805	746.5	9.78	155.02	5.5	7.28	1.43	25.85	
220	22.82	1069.2	0.837	113.13	467.32	354.2	1.567	0.902	430.43	10.43	141.21	7.94	4.78	1.18	21.11	1.809
249.13	101.3	1010.8	3.38	159.78	489.53	329.74	1.636	1.046	305.24	11.06	127.8	10.34	3.91	1.12	16.69	2.06
270	235.51	965.9	7.51	194.62	504.5	309.88	1.699	1.173	226.77	11.51	118.2	12.05	3.26	1.12	13.65	2.321
290	465.43	919.43	14.499	229.39	517.72	288.34	1.774	1.312	179.43	11.94	108.99	13.86	2.92	1.13	10.84	2.679
310	835.96	868.14	26.018	265.86	529.29	263.43	1.875	1.483	144.1	12.37	99.78	16.44	2.71	1.12	8.16	3.231
330	1393.7	809.51	44.602	304.64	538.31	233.67	2.028	1.728	114.48	12.8	90.58	19.8	2.56	1.12	5.64	4.181
350	2192.4	738.36	75.333	346.87	542.95	196.08	2.31	2.182	88.18	13.24	81.37	23.91	2.5	1.21	3.3	6.175
378	3850.9	580.1	176.16	419.75	529.48	109.73	4.519	6.02	56.44	16.72	68.48	30.98	3.72	3.25	0.55	23.59
Uncertainty	a[1]	a[1]	d[1]	d[1]	d[1]	d[1]	d[1]	d[1]	f[2,3]	f[2,4]	f[5]	f[5]	f[7]	f[7]	e[6]	c[1]

[1]Ref. [113]; [2]Ref. [32]; [3]Ref. [49]; [4]Ref. [109]; [5]Ref. [31]; [6]Ref. [78]; [7]Calc. from other properties.

Methane CH_4 (T_c = 190.564 K, p_c = 4.5992 MPa, ρ_c = 162.66 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
111.67	101.3	422.36	1.8165	−910.9	−397.9	513	3.481	2.162	106.5	4.49	193	12.1	1.88	0.77	13.5	3.473
120	191.4	409.9	3.2619	−881.5	−386.9	494.6	3.549	2.293	86.05	4.84	178	12.9	1.7	0.79	11.5	3.776
130	367.3	394.04	5.9804	−845.3	−373.3	472	3.658	2.421	71.65	5.28	163	16.4	1.6	0.71	9.28	4.254
140	641.2	376.87	10.152	−807.7	−362.6	445.1	3.813	2.611	61.26	5.74	148	19.6	1.56	0.68	7.22	4.928
150	1040	357.9	16.328	−768.3	−355.7	412.6	4.047	2.908	52.24	6.27	133	23	1.55	0.69	5.31	5.942
160	1592.1	336.31	25.382	−726.1	−353.9	372.3	4.435	3.419	44.54	6.89	118	27.6	1.56	0.72	3.58	7.633
170	2328.3	310.5	38.974	−679.7	−359.4	320.3	5.187	4.459	37.69	7.69	103	33.7	1.89	0.83	2.06	11.01
180	3285.2	276.23	61.375	−625.0	−378.1	246.9	7.292	7.574	30.98	8.89	88	39.9	2.62	1.33	0.81	21.07
185	3861.7	251.36	80.435	−590.4	−398.5	191.9	11.109	13.527	26.92	9.84	80	45.3	3.8	1.38	0.33	40.71
190	4518.6	200.78	125.18	−532.7	−451.9	80.8	94.01	140.81	19.34	12.96	73	62	18.8	58.01	0.01	523.3
Uncertainty	a[1]	a[1]	a[1]	a[1]	a[1]	a[1]	c[1]	c[1]	h[2]	h[2]	h[3]	h[4]	h[6]	h[6]	h[5]	c[1]

[1]Ref. [96]; [2]Ref. [125]; [3]Ref. [118]; [4]Ref. [60]; [5]Ref. [73]; [6]Calc. from other properties.

Methanol CH_3OH (T_c = 512.6 K, p_c = 8.1035 MPa, ρ_c = 275.6 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
175.61	0.0002	904.56	4.10^{-6}	−1471.8	−157.33	1314.5	2.2	1.26			243		108.5			
230	0.1511	850.76	0.0025	−1350.9	−92.77	1258.2	2.26	1.9	1890		224		19.05			1.1
280	6.177	803.22	0.0864	−1234.2	−38.60	1195.6	2.43	3.17	713		207		8.38		23.8	1.17
337.63	101.33	748.35	1.221	−1083.5	17.52	1101.1	2.83	4.44	329	11.1	188	18.3	4.95	2.69	18.9	1.28
360	229.92	725.36	2.668	−1018.0	35.91	1053.9	3.03	4.86	248	11.8	183	21.4	4.11	2.68	16.9	1.48
385	507.17	697.22	5.744	−938.7	51.43	990.15	3.31	5.44	187	12.7	178	24.9	3.47	2.78	14.5	1.73
410	1006.4	665.22	11.401	−852.0	58.35	910.35	3.63	6.36	141	13.6	173	29.1	2.96	2.97	11.8	2.04
435	1834.9	627.36	21.486	−756.2	53.26	809.48	4.06	7.71	107	14.6	170	34.2	2.56	3.29	9.08	2.28
460	3121.6	580.14	38.821	−648.6	41.38	689.97	4.71	8.2	82	15.9	165	41.6	2.34	3.13	6.08	3.94
500	6525	451.53	109.88	−426.5	−35.42	391.06	9.97	19.04	54	20.4		66.4		5.85	1.26	12.2
Uncertainty	a[1]	a[1]	d[1]	d[1]	d[1]	d[1]	c[1]	d[1]	f[2]	f[2]	f[2]	f[3,5]	f[6]	f[6]	e[4]	c[1]

[1]Ref. [91]; [2]Ref. [35]; [3]Ref. [120]; [4]Ref. [125]; [5]Estimated values; [6]Calc. from other properties.

Ethane C_2H_6 (T_c = 305.32 K, p_c = 4.872 MPa, ρ_c = 206.2 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
90.37	0.001142	651.5	0.000046	−219.19	375.58	594.77	2.326	1.168	1280.8	3.04	255.62	2.91	11.65	1.22	31.67	1.692
150	9.64	585.2	0.234	−82.41	448	530.41	2.333	1.312	269.6	4.8	200.71	6.67	3.13	0.944	21.67	1.968
175	58.59	555.6	1.239	−23.21	478.35	501.56	2.403	1.387	187.9	5.58	176.17	8.64	2.56	0.896	17.58	2.196
184.57	101.33	543.8	2.05	0	489.4	489.4	2.439	1.433	166.4	5.89	166.97	9.49	2.43	0.888	16.03	2.313
200	217.2	524	4.17	38.3	506.19	467.89	2.512	1.537	138.3	6.39	152.56	11.01	2.28	0.892	13.59	2.55
225	589.4	488.9	10.72	103.4	529.76	426.36	2.687	1.775	104	7.28	130.24	13.97	2.15	0.924	9.76	3.14
250	1300.8	448	23.59	174.18	546.53	372.35	2.994	2.16	78.2	8.34	109.29	17.93	2.14	1.01	6.16	4.28
275	2495.2	395.8	48.64	254.92	550.55	295.63	3.702	3.11	56.9	9.92	89.37	24.32	2.36	1.27	2.91	7.37
300	4357.3	303.5	114.5	364.39	514.1	149.7	10.022	13.299	35	14.02	71.49	47.46	4.9	3.93	0.33	43.3
305.32	4872.2	206.2	206.2	438.99	438.99											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	d[2]	d[2]	d[2]	d[2]	d[3]	d[3]	e[4]	b[1]

[1]Refs. [8]; [2]Ref. [21]; [3]Calc. from other properties; [4]Ref. [53].

Ethylene C_2H_4 (T_c = 282.35 K, p_c = 5.042 MPa, ρ_c = 214.2 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
103.99	0.122	654.6	0.00396	−158.10	409.42	567.52	2.429	1.187	685.7	0.77	270.65	6.8	6.16	0.135	28.14	1.93
125	2.53	627.7	0.068	−107.04	434.12	541.17	2.422	1.195	378.7	3.83	242.07	7.01	3.79	0.652	24.03	2.067
150	27.38	594.6	0.624	−46.74	462.39	509.13	2.404	1.232	233.4	5.31	209.67	8.51	2.68	0.769	19.32	2.284
169.38	101.33	567.7	2.09	0	482.41	482.41	2.418	1.295	175.5	6.03	186.47	9.68	2.28	0.807	15.83	2.529
175	139.4	559.5	2.81	13.66	487.76	474.1	2.428	1.32	163	6.23	180.09	10.04	2.2	0.819	14.84	2.618
200	455.5	521.2	8.49	75.68	508.13	432.45	2.529	1.492	120.5	7.13	153.73	11.86	1.98	0.897	10.63	3.177
225	1127.6	477.2	20.59	141.72	520.8	379.08	2.764	1.826	90.2	8.26	129.81	14.61	1.92	1.03	6.74	4.253
250	2329.5	422	44.97	216.09	520.38	304.3	3.363	2.661	65.4	9.93	106.84	19.56	2.06	1.35	3.27	7.052
275	4275.2	330.8	106.46	314.62	484.31	169.7	7.588	9.293	40.4	13.76	81.58	39.17	3.76	3.27	0.51	30.78
282.35	5041.8	214.2	214.2	399.43	399.43											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	e[2]	f[2]	e[2]	f[2]	e[3]	f[3]	f[4]	b[1]

[1]Ref. [98]; [2]Ref. [36]; [3]Calc. from other properties; [4]Ref. [99].

Ethine C_2H_2 (T_c = 308.7 K, p_c = 6.240 MPa, ρ_c = 230 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
192.2	128	617	2.16	−369.5	214.8	584.3	3.09	1.47	169	7.35	55.9	11.2	9.34	0.96	19.1	2.2
200	189	606	3.11	−351.8	222.9	574.7	3.12	1.51	156	7.67	54.3	12	8.96	0.97	17.6	2.4
210	304	590	4.86	−331.6	230.9	562.5	3.15	1.59	146	8.1	51.9	13.1	8.86	0.98	15.6	2.66
230	689	556	10.8	−271.6	248.6	520.2	3.27	1.8	127	8.68	48	15.4	8.65	1.01	11.8	3.2
240	986	538	15.6	−236.1	254.4	490.5	3.35	1.93	116	9.03	48.3	16.9	8.39	1.03	9.92	3.49
250	1370	519	22.1	−202.0	257.6	459.6	3.46	2.14	99.6	9.44	44.9	18.5	7.68	1.09	8.12	3.87
270	2450	473	41	−136.2	257	393.2	3.87	2.64	79.9	10.5	43	22.6	7.19	1.23	4.64	5.56
280	3190	445	54	−100.5	252.8	363.3	4.25	2.93	66.9	11.2	42.2	25	6.75	1.31	3.11	6.45
290	4080	411	73.2	−66.2	238.8	305	5.14	3.39	56.9	12.1	41.5	28.3	7.04	1.45	1.73	10.36
308.7	6240	231	231	104.7	104.7											
Uncertainty	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[2,3]	h[1]	h[2,4]	h[5,6]	h[7]	h[8,9]	h[12]	h[12]	h[10]	h[11]

[1]Ref. [60]; [2]Ref. [89]; [3]Ref. [137]; [4]Ref. [59]; [5]Ref. [106]; [6]Ref. [42]; [7]Ref. [93]; [8]Ref. [117]; [9]Ref. [108]; [10]Ref. [40]; [11]Estimated values; [12]Calc. from other properties.

Ethanol C_2H_6O, CH_3CH_2OH (T_c = 513.90 K, p_c = 6.148 MPa, ρ_c = 276.0 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
300	8.84	783.82	0.164	265.2	1185	919.7	2.597	1.605	1043	8.6	175.1	15.1	15.47	0.91	21.95	1.083
320	25.46	766.38	0.446	319.6	1216.1	896.4	2.838	1.673	736.3	9.2	171.4	16.8	12.19	0.92	20.25	1.174
340	63.54	747.74	1.058	378.7	1247.0	868.3	3.064	1.753	534	9.8	167.6	18.7	9.76	0.92	18.45	1.3
351.39	101.33	736.44	1.647	414.3	1264.3	849.9	3.185	1.806	448.7	10.2	165.4	19.9	8.64	0.93	17.38	1.388
375	239.88	711.05	3.75	492.4	1298.5	806.0	3.423	1.944	319	11	160.9	22.6	6.79	0.94	15.09	1.619
400	524.46	680.64	8.009	581.2	1331.2	750.0	3.665	2.148	226.4	11.8	155.7	25.3	5.33	1	12.53	1.959
425	1029.28	645.46	15.701	676.0	1358.3	682.2	3.923	2.444	163	12.6	149.6	28.2	4.27	1.09	9.85	2.472
450	1850.55	603.51	29.001	777.7	1377.2	599.5	4.261	2.916	118.5	13.6	141.2	31.6	3.58	1.25	7.08	3.36
475	3096.32	550.1	51.995	888.7	1383.7	495	4.877	3.823	86.7	14.8	127.2	35.7	3.32	1.58	4.25	5.36
513.9	6148	276	276	1191.8	1191.8				63.7	16.9	100.1	42.5			1.43	
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	f[1]	e[2]	f[1]	h[3,4]	h[5]	h[5]	e[1]	d[1]

[1]Ref. [16]; [2]Ref. [125]; [3]Ref. [118]; [4]Ref. [108]; [5]Calc. from other properties.

Ethylenoxide C_2H_4O, $(CH_2)_2O$ (T_c = 469 K, p_c = 7.194 MPa, ρ_c = 315 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
283.5	101.3	889	1.94	−440	129	569	1.96	1.09	284	9	158	11.5	3.52	0.85	25.87	1.6
300	186	866	3.44	−409	144	553	2.01	1.17	245	9.6	152	13.6	3.24	0.83	23.24	1.71
320	359	835	6.33	−367	161	528	2.09	1.28	210	10.3	144	16.3	3.04	0.81	20.1	1.86
340	621	804	10.8	−333	178	511	2.19	1.4	182	11	135	19.3	2.93	0.8	17.03	2.08
360	1030	760	17.5	−289	193	482	2.32	1.55	160	11.7	127	22.5	2.92	0.81	14.03	2.32
380	1660	721	27.2	−238	206	444	2.48	1.73	142	12.5	119	25.1	2.97	0.86	11.11	2.68
400	2480	691	41.1	−183	215	398	2.68	1.99	128	13.4	110	29.9	3.12	0.89	8.29	3.26
420	3450	682	61.6	−129	219	348	2.92	2.47	116	14.4	102	34.5	3.34	1.01	5.5	4.42
440	4830	584	93.9	−65	211	276	3.21	3.4	105	15.9	93	40.4	3.63	1.34	3.05	6.08
469	7194	315	315	66	66				47	47	69	69				
Uncertainty	h[1]	h[2]	h[3]	h[11]	h[4,3]	h[1]	h[5]	h[3,4]	h[6,1]	h[1,7]	h[8,1]	h[9,1]	h[12]	h[12]	h[10]	h[11]

[1]Ref. [22]; [2]Ref. [97]; [3]Ref. [52]; [4]Ref. [6]; [5]Ref. [67]; [6]Ref. [71]; [7]Ref. [107]; [8]Ref. [68]; [9]Ref. [69]; [10]Ref. [48]; [11]Estimated values; [12]Calc. from other properties.

Acetic acid $C_2H_4O_2$ (T_c = 594.75 K, p_c = 5.790 MPa, ρ_c = 350.6 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
391.15	101.3	939	1.93	260	642	382	2.42	1.39	372	10.4	158	20.7	5.7	0.7	18.1	1.4
420	230	900	4.53	326	703	377	2.55	1.49	276	11.4	150	23.8	4.69	0.71	15.3	1.46
440	382	874	7.56	372	740	368	2.66	1.58	232	11.9	143	26.3	4.32	0.71	13.5	1.52
460	427	846	12	420	775	355	2.76	1.69	194	12.4	137	29	3.91	0.72	11.6	1.68
480	898	815	18.4	473	807	334	2.91	1.82	166	13	131	32.2	3.69	0.73	9.7	1.94
500	1320	782	27.3	524	834	310	3.04	1.99	138	13.7	125	35.9	3.36	0.76	7.9	2.29
520	1890	743	39.9	580	850	270	3.21	2.24	115	14.4	118	40.3	3.13	0.8	6	2.86
540	2630	697	57.8	643	874	231	3.43	2.66	95	15.3	112	45.9	2.91	0.89	4.28	3.82
560	3590	642	85	710	882	172	3.82	3.59	76	16.5	105	53.6	2.76	1.11	2.47	5.47
594.75	5790	350.6	350.6	854	854						93	93				
Uncertainty	h[1]	h[1]	h[2]	h[3]	h[3]	h[13]	h[4]	h[5,2]	h[6,7]	h[6,8]	h[9,10,11]	h[10,12]	h[14]	h[14]	h[1]	h[13]

[1]Ref. [125]; [2]Ref. [52]; [3]Ref. [12]; [4]Ref. [63]; [5]Ref. [115]; [6]Ref. [87]; [7]Ref. [59]; [8]Ref. [107]; [9]Ref. [94]; [10]Ref. [89]; [11]Ref. [88]; [12]Ref. [108]; [13]Estimated values; [14]Calc. from other properties.

Propane C_3H_8 (T_c = 369.89 K, p_c = 4.251 MPa, ρ_c = 220.5 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
85.53	1.7×10^{-7}	733.1	1×10^{-8}	−196.63	366.26	562.9	1.916	0.879	10779	2.64	207.92	1.71	99.32	1.36	37.71	1.425
200	20.19	615.4	0.542	32.53	488.63	456.1	2.127	1.287	288	5.51	147.84	8.97	4.14	0.791	20.27	1.752
225	77.02	587.8	1.873	86.86	518.7	431.85	2.219	1.407	211.4	6.15	132.73	11.04	3.53	0.784	16.68	1.94
231.04	101.33	580.9	2.416	100.36	525.95	425.59	2.246	1.44	197.2	6.31	129.18	11.57	3.43	0.786	15.83	1.997
250	217.96	558.3	4.94	143.93	548.45	404.52	2.343	1.558	160	6.8	118.37	13.32	3.17	0.796	13.21	2.218
275	501.8	526.1	10.93	204.64	576.9	372.26	2.507	1.756	123.2	7.5	105.02	15.95	2.94	0.826	9.89	2.652
300	997.7	489.4	21.63	270.15	602.6	332.45	2.74	2.041	95.3	8.34	92.86	19.24	2.81	0.885	6.76	3.409
325	1783.3	445.2	40.43	342.46	622.87	280.41	3.128	2.552	72.5	9.51	81.81	23.89	2.77	1.02	3.89	5.031
350	2951.4	383.8	77.03	426.7	629.95	203.26	4.208	4.16	51.6	11.63	71.48	32.73	3.03	1.48	1.4	10.95
369.89	4251.2	220.5	220.5	555.24	555.24											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	d[2]	d[2]	d[3]	d[3]	d[4]	d[4]	e[5]	b[1]

[1]Ref. [56]; [2]Ref. [128]; [3]Ref. [65]; [4]Calc. from other properties; [5]Ref. [4].

Propylene C_3H_6, $CH_3CH{=}CH_2$ (T_c = 364.21 K, p_c = 4.555 MPa, ρ_c = 230.1 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
225.53	101.33	610.1	2.358	90.12	529.08	438.96	2.193	1.332	151	6.6	119	9.5	2.78	0.93	16.5	2.039
240	187.15	591.8	4.178	122.32	544.59	422.27	2.25	1.413	132	7.1	111	11.2	2.68	0.9	14.7	2.2
255	325.97	571.9	7.044	156.71	560.08	403.37	2.324	1.512	108	7.5	104	13	2.41	0.88	12.6	2.417
270	531.03	550.8	11.239	192.34	574.7	382.36	2.414	1.632	101	8	98.6	14.9	2.47	0.88	10.5	2.706
285	819.2	528	17.2	229.48	588.12	358.64	2.53	1.782	99.2	8.7	93.6	17.1	2.68	0.91	8.7	3.109
300	1208.6	503.1	25.57	268.52	599.85	331.32	2.684	1.976	90.3	9.3	90.9	19.4	2.67	0.94	6.5	3.706
315	1718.6	474.9	37.35	310.03	609.01	298.98	2.906	2.279	80.9	10.1	88	22.2	2.67	1.04	5.1	4.68
330	2370.8	441.7	54.41	355.01	614.32	259.32	3.279	2.802	78.7	11.4	83.3	25.4	3.1	1.26	3.4	6.52
345	3191.3	398.9	81.3	405.8	612.16	206.36	4.143	4.102	61.1	12.7	76.1	29.6	3.33	1.76	2	11.39
364.21	4555	230.1	230.1	529.62	529.62				32	32	49.3	49.3				
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	h[2]	h[2]	h[3]	h[4,5]	h[6]	h[6]	h[2]	b[1]

[1]Ref. [81]; [2]Ref. [22]; [3]Ref. [93]; [4]Ref. [74]; [5]Ref. [108]; [6]Calc. from other properties.

1-Propanol C_3H_8O, $CH_3CH_2CH_2OH$ (T_c = 536.85 K, p_c = 5.050 MPa, ρ_c = 273 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h$'$, kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
373.2	109.4	732.5	2.26	0	687	687	3.21	1.65	447	9.61	142.4	20.9	10.1	0.76	17.6	1.33
393.2	218.5	711	4.43	65	710	645	3.47	1.82	337	10.3	139.2	23	8.4	0.82	16.15	1.52
413.2	399.2	687.5	8.05	139	733	594	3.86	1.93	250	10.9	138.4	26.2	6.97	0.8	14.42	1.79
433.2	683.6	660	13.8	222	766	544	4.36	2.05	188	11.5	133.5	28.9	5.14	0.82	12.7	2.19
453.2	1089	628.5	22.5	315	802	486	5.02	2.2	148	12.2	127.9	31.4	5.81	0.85	10.77	2.7
473.2	1662	592	35.3	433	860	427	5.9	2.36	119	12.9	120.7	34.7	5.82	0.88	8.85	3.35
493.2	2426	548.5	55.6	548	904	356	6.78	2.97	90.6	14.2	111.8	38	5.5	1.11	6.35	4.36
513.2	3402	492	90.4	691	955	264	7.79	3.94	70	15.7	100.6	43.9	5.42	1.41	4.04	6.17
523.2	3998	452.5	118			209			61.4	17	94.1	47.5			2.6	8.4
533.1	4689	390.5	161			138			53.9	19.3	89.3	53.5		0.96		
Uncertainty	h[1]	h[1]	h[1]	h[9]	h[9]	h[1]	h[2]	h[3,4]	h[1,5]	h[5,6]	h[2]	h[5,7]	h[9]	h[9]	h[2]	h[8]

[1]Ref. [125]; [2]Ref. [73]; [3]Ref. [67]; [4]Ref. [18]; [5]Ref. [68]; [6]Ref. [107]; [7]Ref. [108]; [8]Estimated values; [9]Calc. from other properties.

Propylene oxide C_3H_6O, $CH_3(CHCH_2)O$ (T_c = 482.2 K, p_c = 4.920 MPa, ρ_c = 312 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
307.5	101.3	812	2.38	−293	184	477	2.06	1.32	278	9.1	147	12.1	3.9	0.9	19.9	1.59
320	159	796	3.57	−271	198	469	2.1	1.39	251	9.5	143	13.3	3.69	0.99	18.2	1.68
340	297	769	6.39	−220	220	440	2.18	1.49	217	10.2	135	15.5	3.49	0.98	15.5	1.8
360	496	740	10.7	−177	242	419	2.29	1.62	191	10.8	128	17.8	3.41	0.98	12.9	2.04
380	814	709	17.2	−135	263	39	2.42	1.76	171	11.5	120	20.5	3.44	0.99	10.4	2.31
400	1230	675	26.6	−86	282	368	2.6	1.94	155	12.3	113	23.5	3.57	1.02	8	2.72
420	1790	636	40.5	−37	298	335	2.81	2.19	143	13.1	105	26.9	3.84	1.07	5.7	3.34
440	2480	591	61.1	33	309	276	3.07	2.63	133	14.1	96	31.3	4.23	1.18	3.5	3.76
460	3450	531	95.9	106	307	201	3.38	3.83	125	15.5	88	47.4	4.79	1.25	1.6	12.69
482.2	4920	312	312	200	200				48	48	71	71				
Uncertainty	h[1]	h[2]	h[3]	h[13]	h[3,4]	h[1]	h[5]	h[3,4]	h[1,6]	h[1,7,8]	h[9,1]	h[10,1]	h[13]	h[13]	h[11]	h[12]

[1]Ref. [22]; [2]Ref. [97]; [3]Ref. [52]; [4]Ref. [6]; [5]Ref. [67]; [6]Ref. [71]; [7]Ref. [70]; [8]Ref. [107]; [9]Ref. [68]; [10]Ref. [69]; [11]Ref. [48]; [12]Estimated values; [13]Calc. from other properties.

Isopropylalcohol C_3H_8O, $(CH_3)_2CHOH$ (T_c = 508.75 K, p_c = 5.370 MPa, r_c = 274 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
355.65	101.3	732.3	2.06	0	677.8	677.8	3.37	1.63	502	9.08	131.1	19.8	12.9	0.75	18.6	1.41
373	200	712.7	4.15	60.1	688	627.9	3.55	1.71	376	9.8	127.5	22.2	10.5	0.75	17.2	1.76
390	380	683	7.73	121.8	736.8	615	3.71	1.8	295	10.3	124.3	24.6	8.81	0.75	14.2	2.12
408	580	660	14.3	190.2	767.9	577.7	3.88	1.94	230	10.9	122.8	27.1	7.27	0.78	11.84	2.39
425	925	630.1	21	257.6	796.1	538.5	4.04	2.15	184	11.4	120.1	29.3	6.19	0.84	9.4	2.75
443	1425	597.4	32.78	331.8	822.9	491.1	4.2	2.37	147	11.9	117.3	31.8	5.27	0.89	6.9	3.22
459	2025	566	46.4	400.1	841.7	441.6	4.34	2.83	122	12.5	115.8	34.9	4.57	1.01	4.97	3.94
478	3039	514.8	72.3	484	851.5	367.5	4.49	3.97	93.5	13.7	113.2	38.9	3.71	1.4	2.6	5.46
498	4052	460.5	108.4			284.5			72.5	15.2	110.7	42.3		1.05	23.46	
508	5369	288	252			82.5				28.2	107.7	47.1			0	
Uncertainty	h[1,2]	h[1,2]	h[1,2]	h[9]	h[9]	h[1,3]	h[2]	h[4,5]	h[1]	h[1,6]	h[1]	h[1,7]	h[9]	h[9]	h[1]	h[8]

[1]Ref. [125]; [2]Ref. [116]; [3]Ref. [132]; [4]Ref. [42]; [5]Ref. [18]; [6]Ref. [107]; [7]Ref. [108]; [8]Estimated values; [9]Calc. from other properties.

Acetone C_3H_6O, CH_3COCH_3 (T_c = 508.10 K, p_c = 4.700 MPa, ρ_c = 273 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
329.23	101.33	748.95	2.268	0	501.43	501.43	2.229	1.567	235	9.4	142	12.7	3.69	1.16	18.4	1.587
340	144.5	736.03	3.173	24.23	513.55	489.32	2.264	1.635	213	9.8	137	14.1	3.52	1.14	17	1.659
360	261.88	711.08	5.597	70.28	535.79	465.51	2.336	1.77	188	10.4	129	16.1	3.4	1.14	14.5	1.824
380	442.4	684.55	9.313	117.89	557.43	439.54	2.42	1.921	165	11.1	121	18.5	3.3	1.15	12.1	2.043
400	705.59	655.92	14.83	167.3	578.03	410.74	2.519	2.099	141	11.8	112	21.2	3.17	1.17	9.6	2.346
420	1073.31	624.5	22.895	218.84	596.98	378.14	2.643	2.322	119	12.6	104	24.2	3.02	1.21	7.1	2.789
440	1570.25	589.14	34.72	272.98	613.25	340.28	2.81	2.634	99	13.5	96	27.2	2.9	1.31	4.6	3.49
460	2224.94	547.85	52.555	330.55	625.11	294.57	3.067	3.156	80	14.4	87	31	2.82	1.47	3.1	4.76
480	3072.5	496.13	81.608	393.32	628.82	235.5	3.597	4.338	64	15.8	77	36	2.99	1.9	1.6	7.84
508.1	4700	272.97	272.97	544.34	544.34				49	49	58	58				
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[2,3,4]	h[5,6]	h[7,8,9]	h[8,9]	h[11]	h[11]	h[10]	d[1]

[1]Ref. [58]; [2]Ref. [89]; [3]Ref. [82]; [4]Ref. [59]; [5]Ref. [106]; [6]Ref. [107]; [7]Ref. [93]; [8]Ref. [127]; [9]Ref. [108]; [10]Ref. [61]; [11]Calc. from other properties.

Methyl acetate $C_3H_6O_2$ (T_c = 506.8 K, p_c = 4.687 MPa, ρ_c = 325 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h′, kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
331	101.3	875	2.83	−173.4	228.5	401.9	1.92	1.19	260	8.9	157	14.2	3.18	0.75	19.4	1.64
350	200	850	5.16	−136.1	249.1	385.2	1.99	1.25	225	9.5	146	15.7	3.07	0.76	17	1.79
370	359	820	8.87	−96.5	269.8	366.3	2.08	1.35	192	10.1	133	17.5	3	0.78	14.7	1.98
390	537	780	14.5	−57.7	289.8	347.5	2.18	1.45	168	10.7	122	19.5	3	0.8	12	2.19
410	854	750	22.7	−17.8	308.8	326.6	2.32	1.57	145	11.4	110	21.7	3.04	0.82	9.4	2.53
430	1344	715	34.6	26.7	326	297.3	2.46	1.72	121	12.1	98	24.1	3.05	0.86	6.9	3
450	1930	680	52.2	76.4	340.2	263.8	2.65	1.95	99	13.1	86	27	3.06	0.95	4.6	3.78
470	2688	620	79.3	126.7	348.6	221.9	2.94	2.38	80	14.1	74	30.4	3.18	1.1	2.4	5.12
490	3723	540	127.8	196.4	342.9	146.5	3.58	3.86	62	16.1	61	35.3	3.64	1.76	1.1	8.89
506.8	4687	325	325	254.6	254.6				56	56	50.3	50.3				
Uncertainty	h[1]	h[1]	h[2]	h[10]	h[3,2]	h[1]	h[4]	h[1,2]	h[1,5]	h[1,6]	h[1,7]	h[1,7]	h[10]	h[10]	h[1,8]	h[9]

[1]Ref. [22]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [63]; [5]Ref. [126]; [6]Ref. [107]; [7]Ref. [108]; [8]Ref. [89]; [9]Estimated values; [10]Calc. from other properties.

n-Butane C_4H_{10} (T_c = 425.13 K, p_c = 3.796 MPa, ρ_c = 228 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
134.9	0.000666	735	0.000034	−89.82	406.11	495.93	1.973	1.106	2304.3	3.32	176.56	4.85	25.75	0.757	33.49	1.271
225	10.57	649.9	0.331	93.36	518.07	424.71	2.127	1.412	349.8	5.6	137.5	10.25	5.41	0.771	20.97	1.506
250	39.15	625	1.118	147.6	552.57	404.97	2.213	1.523	259.3	6.21	125.77	12.2	4.56	0.775	17.72	1.635
272.66	101.33	601.3	2.71	198.87	584.58	385.71	2.31	1.641	203.5	6.76	115.53	14.14	4.07	0.784	14.88	1.795
300	257.6	570.7	6.52	264	623.58	359.58	2.451	1.811	155.6	7.44	103.93	16.78	3.67	0.802	11.6	2.073
325	520.1	539.9	12.83	327.34	658.9	331.56	2.612	2.002	123.3	8.12	94.24	19.6	3.42	0.83	8.76	2.467
350	944.2	505.2	23.39	395.14	692.84	297.7	2.82	2.25	97.6	8.96	85.5	23.06	3.22	0.875	6.1	3.13
375	1581.6	463.7	41.01	468.72	723.35	254.63	3.132	2.637	75.9	10.11	77.68	27.66	3.06	0.964	3.66	4.45
400	2495.4	408.5	73.08	551.22	745.21	193.99	3.838	3.623	56	12.03	70.6	35.03	3.04	1.24	1.53	8.52
425.13	3796	228	228	693.91	693.91											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	d[2]	d[2]	d[3]	d[3]	d[4]	d[4]	e[5]	b[1]

[1]Refs. [9]; [2]Ref. [130]; [3]Ref. [86]; [4]Calc. from other properties; [5]Ref. [10].

Isobutane C_4H_{10} (T_c = 407.81 K, p_c = 3.629 MPa, ρ_c = 225.5 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
113.73	0.000023	740.3	0.000001	−112.38	368.32	480.7	1.689	0.88	8767.2	2.85	157.92	2.27	93.76	1.1	33.23	1.276
225	18.62	632.5	0.586	95.57	490.85	395.28	2.061	1.353	367.5	5.7	118.44	10.03	6.39	0.769	18.92	1.623
250	63.35	606.3	1.825	148.44	523.43	374.99	2.168	1.481	262	6.3	107.94	12.17	5.26	0.767	15.83	1.784
261.4	101.33	593.8	2.83	173.49	538.6	365.1	2.222	1.547	227.8	6.58	103.29	13.2	4.9	0.771	14.44	1.877
275	167.51	578.4	4.53	204.24	556.82	352.58	2.293	1.631	194.4	6.91	97.91	14.48	4.55	0.778	12.81	2.01
300	370	548.3	9.61	263.5	590.37	326.87	2.442	1.81	148.2	7.55	88.6	17.02	4.09	0.802	9.89	2.349
325	716.6	514.7	18.42	326.92	623.2	296.28	2.631	2.036	114.7	8.28	80.17	20.02	3.76	0.842	7.11	2.9
350	1258.7	475.5	33.23	395.61	653.77	258.16	2.898	2.355	88.6	9.24	72.68	23.93	3.53	0.91	4.52	3.95
375	2055.7	425.3	59.24	471.92	678.4	206.48	3.404	3.031	66.2	10.81	66.12	30.04	3.41	1.09	2.2	6.69
407.81	3629	225.5	225.5	633.94	633.94											
Uncertainty	a[1]	a[1]	a[1]	b[1]	b[1]	b[1]	c[1]	c[1]	d[2]	d[2]	d[3]	d[3]	d[4]	d[4]	e[5]	b[1]

[1] Refs. [9]; [2]Ref. [130]; [3]Ref. [84]; [4]Calc. from other properties; [5]Ref. [4].

1,2-Butadiene C_4H_6, CH_3 CH=C=CH_2 (T_c = 443.7 K, p_c = 4.500 MPa, ρ_c = 246.8 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
284	101.3	651	2.32	−197	237	434	2.2	1.48	200	7.4	126	12.5	3.62	0.88	18	1.71
300	189	643	4.04	−166	257	423	2.24	1.56	185	7.78	119	14.1	3.48	0.86	15.7	1.87
315	265	625	6.43	−131	275	406	2.3	1.65	170	8.27	113	15.8	3.46	0.86	13.9	2.02
330	445	605	9.8	−94	293	387	2.41	1.75	150	8.76	107	17.5	3.38	0.88	12.1	2.18
345	661	585	14.4	−57	311	368	2.49	1.87	134	9.26	102	19.3	3.27	0.9	10.4	2.39
360	945	563	20.7	−19	327	346	2.6	2.01	116	9.77	98	21.2	3.08	0.93	8.65	3.26
375	1310	537	29.2	79	341	322	2.72	2.18	100	10.4	93	23.3	2.92	0.97	7	3.39
390	1770	507	40.7	61	354	293	2.87	2.43	85	11	88	25.6	2.77	1.04	5.3	3.78
400	2140	485	50.8	88	359	271	3.01	2.68	76	11.5	82	27.3	2.79	1.13	4.1	4.28
443.7	4500	246.8	246.8	255	255				43	43	49	49				
Uncertainty	h[1,2]	h[1]	h[3]	h[10]	h[1,3]	h[1]	h[1]	h[1,3]	h[1,4]	h[1,5]	h[6]	h[7,8]	h[10]	h[10]	h[1]	h[9]

[1]Ref. [22]; [2]Ref. [27]; [3]Ref. [52]; [4]Ref. [59]; [5]Ref. [42]; [6]Ref. [93]; [7]Ref. [74]; [8]Ref. [108]; [9]Estimated values; [10]Calc. from other properties.

1,3-Butadiene C_4H_6, CH_2=CHCH=CH_2 (T_c = 425.15 K, p_c = 4.330 MPa, ρ_c = 245 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
268.69	101.3	650	2.53	493.3	908.7	415.4	2.14	1.42	200	7.57	126	9.54	3.4	1.13	16.6	1.79
285	184	631	4.41	529	928.4	399.4	2.22	1.53	164	8.43	117	12.3	3.11	1.05	14.5	1.92
300	298	612	6.97	563	946.4	383.4	2.29	1.63	138	8.91	110	14.7	2.87	0.99	12.7	2.07
315	458	593	10.5	598.4	964.4	366	2.37	1.74	117	9.41	103	17.3	2.169	0.95	10.9	2.24
330	676	572	15.5	635	981.7	346.7	2.47	1.87	99.5	9.94	95.6	19.9	2.57	0.93	9.12	2.5
350	1080	541	26.7	686.5	1003.8	317.3	2.63	2.07	84.3	10.7	86.6	23.7	2.56	0.93	6.86	2.97
370	1630	507	38.7	741.5	1023.2	281.7	2.81	2.35	71.3	11.6	78	27.5	2.57	1.02	4.73	3.81
390	2370	464	53.5	800.1	1038.3	238.2	3.03	2.92	61.7	12.6	69.8	31.6	2.68	1.16	2.75	5.45
410	3350	405	101	867.5	1041.4	173.9	3.28	4.54	53.4	15	62	37.8	2.83	1.3	1	12.46
425.15	4330	245	245								53.7	53.7				
Uncertainty	h[1]	h[1]	h[1]	h[1]	h[1]	h[1]	h[1,2]	h[3,4]	h[1,5]	h[6,7]	h[8]	h[9,10]	h[13]	h[13]	h[11]	h[12]

[1]Ref. [125]; [2]Ref. [67]; [3]Ref. [6]; [4]Ref. [18]; [5]Ref. [71]; [6]Ref. [70]; [7]Ref. [42]; [8]Ref. [68]; [9]Ref. [69]; [10]Ref. [108]; [11]Ref. [73]; [12]Estimated values; [13]Calc. from other properties.

n-Butanol $C_4H_{10}O$, $C_2H_5CH_2CH_2OH$ (T_c = 561.15 K, p_c = 4.960 MPa, ρ_c = 270.5 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
390.65	101.3	712	2.3	0	591.3	591.3	3.2	1.87	422.9	9.29	122.9	21.7	11.01	0.81	17.1	1.69
410.2	182	688	4.1	64.8	629.8	565	3.54	1.95	317.3	10.3	117.9	24.2	9.53	0.83	15.6	1.86
429.2	327	664	7.9	135	672.3	537.3	3.95	2.03	245	10.7	113.1	26.7	8.58	0.81	13.9	2.04
446.5	482	640	12.5	206.8	716.5	509.7	4.42	2.14	196.4	11.4	108.7	28.2	7.97	0.86	12.3	2.11
469.5	759	606	23.8	315.3	784.1	468.8	5.15	2.24	149	12.1	102.9	31.3	7.46	0.87	10.2	2.54
485.2	1190	581	27.8	399.6	836.8	437.2	5.74	2.37	124	12.7	99	33.1	7.22	0.91	7.5	2.84
508.3	1830	538	48.2	541.9	924.4	382.5	6.76	2.69	96.8	13.9	93.2	36.9	7.02	1.01	6.44	3.7
530.2	2530	487	74	700.2	1015.3	315.1	7.9	3.05	76.9	15.4	87.7	40.2	6.93	1.17	4.23	5.78
545.5	3210	440	102.3			248.4	3.97	65.8	17.1	74	43.6		1.56	2.11	9.08	
558.9	4030	364	240.2			143			57.6	28.3	62.8	51.5			0.96	
Uncertainty	h[1]	h[2]	h[1]	h[10]	h[10]	h[3]	h[2]	h[4,5]	h[6]	h[6,7]	h[2]	h[6,8]	h[10]	h[10]	h[2]	h[9]

[1]Ref. [73]; [2]Ref. [116]; [3]Ref. [132]; [4]Ref. [67]; [5]Ref. [18]; [6]Ref. [68]; [7]Ref. [107]; [8]Ref. [108]; [9]Estimated values; [10]Calc. from other properties.

Tert.-butanol $C_4H_{10}O$, $(CH_3)_3COH$ (T_c = 506.2 K, p_c = 3.970 MPa, ρ_c = 270 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	h', 10^{-6} kg/(m s)	h'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
355.6	101.3	710	2.64	−182.0	324.6	506.6	2.9	1.81	531	9.4	109	17.9	14.1	0.95	14.5	1.84
375	207	688	5.12	−130.7	355	485.7	3.06	1.92	312	10	104	19.8	9.18	0.97	13	2.03
390	322	670	8.11	−78.4	378	456.4	3.19	2.02	235	10.4	100	21.4	7.5	0.98	11.5	2.19
405	483	647	12.4	−35.2	400.2	435.4	3.34	2.13	180	11	96	23.1	6.26	1.01	10	2.98
420	779	621	18.5	15	421.1	406.1	3.47	2.26	142	11.5	92	24.9	5.36	1.04	8.6	3.04
435	1010	596	27.1	63.3	440.1	376.8	3.62	2.42	118	12.1	88	26.9	4.85	1.09	7.1	3.23
450	1516	567	39.1	117.4	456.5	339.1	3.79	2.64	98	12.8	83	29.1	4.47	1.16	5.5	3.65
465	1896	533	56.4	171.2	468.5	297.3	4.01	3	84	13.6	77	31.6	4.37	1.29	3.8	4.49
480	2619	487	82.3	238.1	472.6	234.5	4.38	3.73	66	14.8	70	34.5	4.13	1.59	2.2	6.26
506.2	3970	270	270	351.6	351.6				65	65	53	53				
Uncertainty	h[1]	h[1]	h[2]	h[12]	h[2,3]	h[1]	h[4]	h[1,2]	h[5,6]	h[1,7]	h[1,8]	h[1,9]	h[12]	h[12]	h[1,10]	h[11]

[1]Ref. [22]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [63]; [5]Ref. [126]; [6]Ref. [59]; [7]Ref. [107]; [8]Ref. [93]; [9]Ref. [108]; [10]Ref. [89]; [11]Estimated values; [12]Calc. from other properties.

Ethyl ether $C_4H_{10}O$, $(CH_3CH_2)_2O$ (T_c = 467 K, p_c = 3.610 MPa, ρ_c = 265 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	h', 10^{-6} kg/(m s)	h'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
307.75	101.3	696.2	3.16	0	349.9	349.9	2.37	1.4	210	7.86	126	15.8	3.95	0.7	15.25	1.93
323	170	676.4	5.08	36.6	373.6	337	2.43	1.96	177	8.28	120	17.4	3.58	0.93	13.5	1.75
343	307	653.2	8.92	85.9	404.1	318.2	2.51	2.05	148	8.86	112	19.5	3.32	0.93	11.3	1.88
363	511	625	14.77	137	434.3	297.3	2.61	2.14	127	9.45	104	22.4	3.19	0.9	9.1	2.23
383	811	594.2	23.49	190.3	464.5	274.2	2.72	2.26	109	10.1	95.6	24.2	3.1	0.94	7	2.79
403	1220	558	36.38	248.6	497.7	249.1	2.86	2.43	95	10.9	87.5	27	3.11	0.98	4.9	3.51
423	1770	517.9	55.51	305	520.6	215.6	3.01	2.75	84	11.7	79.9	30.2	3.16	1.07	3.1	4.54
443	2490	465.8	87.31	367.1	532.5	165.4	3.2	3.44	77	13.1	71.4	34.2	3.45	1.32	1.5	5.9
458	3150	401.8	132	416.1	523.9	107.8	3.75	4.15	70	15	65.3	38.6	4.02	1.61	0.5	14.89
463	3490	366.3	162	433	524.6	81.6	4.07	4.5	67	16.4	63.3	41.5	4.31	1.78	0.2	24.04
Uncertainty	h[1]	h[1]	h[1]	h[9]	h[9]	h[1]	h[1]	h[2,3]	h[1,8]	h[4,5]	h[6]	h[6,7]	h[9]	h[9]	h[1]	h[8]

[1]Ref. [125]; [2]Ref. [6]; [3]Ref. [18]; [4]Refs. [122]; [5]Ref. [107]; [6]Ref. [118]; [7]Ref. [108]; [8]Estimated values; [9]Calc. from other properties.

Ethylacetate $C_4H_8O_2$, $CH_3CO_2C_2H_5$ (T_c = 523.25 K, p_c = 3.832 MPa, ρ_c = 307.7 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	$c_{p'}$, kJ/(kg K)	$c_{p''}$, kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
350.25	101.3	830	3.2	−89.7	274.6	364.3	2.1	1.46	255	8.9	125	15.8	4.28	0.82	17.4	1.65
370	193	800	5.63	−47.3	300.2	347.5	2.17	1.54	221	9.5	118	17.4	4.08	0.84	15	1.79
390	310	770	9.45	− 6.7	326.2	332.9	2.28	1.63	193	10.1	111	19.3	3.96	0.85	12.6	1.99
410	510	740	15.1	35.7	351.8	316.1	2.36	1.73	158	10.7	104	21.5	3.59	0.86	10	2.23
430	792	705	23.4	81.3	376.5	295.2	2.5	1.85	134	11.4	98	23.5	3.42	0.9	7.8	2.57
450	1172	670	35.5	131.7	399.6	267.9	2.64	2	111	12.2	92	25.8	3.19	0.95	5.8	3.06
470	1655	625	54.2	182	420.6	238.6	2.82	2.25	90	13	85	28.5	2.99	1.03	3.9	3.89
490	2275	570	81.3	241.7	434.3	192.6	3.09	2.68	72	14.3	77	32	2.89	1.2	2.3	5.36
510	3172	475	134.5	315.8	433	117.2	3.76	4.52	56	16.4	66	36.5	3.19	2.03	0.74	9.46
523.2	3832	307.7	307.7	362.8	362.8				57	57	48.2	48.2				
Uncertainty	h[1]	h[1]	h[2]	h[11]	h[3,2]	h[1]	h[1,4]	h[3,2]	h[5,6]	h[1,7]	h[8,9]	h[1,9]	h[11]	h[11]	h[11]	h[10]

[1]Ref. [22]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [63]; [5]Ref. [126]; [6]Ref. [59]; [7]Ref. [42]; [8]Ref. [93]; [9]Ref. [108]; [10]Estimated values; [11]Calc. from other properties.

n-Pentane C_5H_{12} (T_c = 469.70 K, p_c = 3.370 MPa, ρ_c = 232.0 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
300	73.17	619	2.194	−21.63	343.22	364.86	2.324	1.714	218.6	6.7	106.6	14.9	4.77	0.77	15.26	1.609
309.21	101.33	609.7	2.975	0	357.58	357.58	2.368	1.764	201.3	7	102.7	15.7	4.64	0.78	14.26	1.672
320	144.35	598.6	4.15	25.86	374.55	348.69	2.422	1.826	183.2	7.2	98.9	16.7	4.49	0.79	13.11	1.758
340	260.16	577	7.261	75.45	406.37	330.92	2.532	1.951	154.5	7.8	92.4	18.7	4.23	0.81	11	1.957
360	436.1	553.9	11.98	127.38	438.38	311.01	2.656	2.092	130.7	8.4	86.8	21	4	0.83	8.96	2.234
380	689.2	528.4	18.93	181.94	470.15	288.21	2.801	2.258	110.7	9	81.5	23.6	3.8	0.86	6.99	2.641
400	1038.4	499.7	29.12	239.57	500.99	261.41	2.981	2.471	93.7	9.7	76.6	26.4	3.65	0.91	5.12	3.29
420	1505	466	44.32	300.97	529.66	228.69	3.233	2.789	78.9	10.7	71.6	29.8	3.56	1	3.37	4.46
440	2114.7	423.5	68.6	367.61	553.52	185.91	3.689	3.441	66.1	12.3	66.5	34.9	3.67	1.22	1.77	7.23
469.7	3370	232	232	520.48	520.48				54.9	14.2	61.5	45.8			0.44	
Uncertainty	a[1]	a[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[1]	f[5]	f[2]	f[3]	f[3]	h[6]	h[6]	e[4]	d[1]

[1]Ref. [102]; [2]Ref. [25]; [3]Ref. [11]; [4]Ref. [100]; [5]Ref. [50]; [6]Calc. from other properties.

Cyclopentane C_5H_{10} (T_c = 511.8 K, p_c = 4.508 MPa, ρ_c = 272 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
322.4	101.3	706	10.8	−288.7	104.9	393.6	1.92	1.34	320	7.9	125	16.3	4.92	0.65	18.6	1.49
350	239	680	20	−217.3	138.6	355.9	2.05	1.47	255	8.9	117	18.5	4.47	0.71	15.1	1.69
370	406	656	36.3	−179.4	163.9	343.3	2.12	1.61	200	9.7	111	20.8	3.82	0.75	13	1.85
390	642	635	52.1	−155.3	189.6	334.9	2.22	1.79	160	10.5	105	23.2	3.38	0.81	11.1	2.07
410	948	607	69.2	−92.8	215.4	318.2	2.37	1.93	128	11.2	98	25.7	3.1	0.84	8.7	2.35
430	1309	577	97.5	−44.2	240.5	284.7	2.53	2.11	109	11.9	91	28.4	3.03	0.88	6.6	2.75
450	1861	547	117	−3.8	264.1	267.9	2.73	2.4	92	12.8	85	31.3	2.95	0.98	4.7	3.38
470	2742	505	141	62.2	284.1	221.9	3.04	2.81	76	13.9	79	34.8	2.92	1.12	2.9	4.45
490	3562	455	176	127.4	294.9	167.5	3.78	3.91	58	15.9	68	39	3.22	1.59	1.3	7.12
511.8	4508	272	272	227.1	227.1				43	43	51.1	51.1				
Uncertainty	h[1]	h[1]	h[11]	h[11]	h[2,3]	h[1]	h[1,4]	h[1,3]	h[1,5]	h[1,6]	h[7]	h[1,8]	h[11]	h[11]	h[1,9]	h[10]

[1]Ref. [22]; [2]Ref. [115]; [3]Ref. [52]; [4]Ref. [126]; [5]Ref. [59]; [6]Ref. [42]; [7]Ref. [68]; [8]Ref. [108]; [9]Ref. [89]; [10]Estimated values; [11]Calc. from other properties.

Isopentane, 2-Methyl Butane C_5H_{12}, $(CH_3)_2C(CH_3)_2$ (T_c = 460.4 K, p_c = 3.380 MPa, ρ_c = 236 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
301	101.3	613	3.07	290.8	632.7	341.9	2.29	1.72	201	7.4	103	14.7	4.47	0.87	14	1.73
325	217	586	6.3	348.9	669.9	321	2.43	1.86	163	8	95	17.4	4.17	0.86	11.5	1.94
340	328	569	9.41	383.8	693.1	309.3	2.53	1.96	146	8.5	91	19.3	4.06	0.86	9.9	2.11
355	476	552	13.5	423.3	716.4	293.1	2.62	2.08	126	9	87	21.5	3.79	0.87	8.4	2.32
370	667	532	18.9	465.2	739.7	274.5	2.71	2.2	111	9.5	84	23.4	3.58	0.89	7	2.59
385	915	511	26.2	504.7	765.3	260.6	2.8	2.34	97	9.9	80	25	3.4	0.93	5.6	2.95
400	1222	488	36	546.6	783.9	237.3	2.91	2.54	84	10.5	75	27.6	3.22	0.97	4.3	3.47
415	1603	461	49.3	588.5	807.1	218.6	3.05	2.81	71	11.2	70	29.4	3.05	1.07	3	4.26
430	2070	428	68.3	639.7	825.7	186	3.24	3.28	60	12.2	63	33.4	2.99	1.2	1.9	5.66
460.4	3380	236	236	790.8	790.8						48.3	48.3				
Uncertainty	h[1]	h[1]	h[1]	h[2]	h[2]	h[2]	h[11,3]	h[1,4]	h[5,6]	h[2,7]	h[8,9]	h[2,10,9]	h[12]	h[12]	h[3]	h[11]

[1]Ref. [125]; [2]Ref. [110]; [3]Ref. [89]; [4]Ref. [52]; [5]Ref. [126]; [6]Ref. [59]; [7]Ref. [42]; [8]Ref. [93]; [9]Ref. [108]; [10]Ref. [22]; [11]Estimated values; [12]Calc. from other properties.

Neopentane, 2,2-Dimethylpropane C_5H_{12}, $C(CH_3)_4$ (T_c = 433.78 K, p_c = 3.196 MPa, ρ_c = 238 kg/m^3)

T_s, K	P_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
282.65	101.3	603	3.28	−111	204	315	2.14	1.65	280	6.89	90	13.2	6.66	0.86	12.9	1.8
305	215	575	6.38	−50	237	297	2.27	1.8	211	7.44	84	15	5.7	0.89	10.6	2.01
320	362	558	9.91	−25	260	284	2.37	1.91	169	7.88	80	16.3	5.01	0.92	9.11	2.2
335	482	543	14.5	13	282	269	2.48	2.03	140	8.27	76	18	4.57	0.03	7.67	2.44
350	676	519	20.7	51	305	254	2.63	2.16	112	8.73	72	19.8	4.09	0.95	6.27	2.75
365	945	497	29	91	327	236	2.77	2.32	94	9.25	67	21.6	3.89	0.99	4.93	3.16
380	1280	472	40.2	128	347	219	2.96	2.53	82	9.87	63	24.2	3.85	1.03	3.65	3.76
395	1700	443	55.8	175	366	191	3.2	2.85	69	10.3	58	26.6	3.81	1.1	2.45	4.75
410	2200	407	79.1	221	379	158	3.59	3.51	61	11.8	54	30.8	4.06	1.34	1.34	6.74
433.78	3196	238	238	329	329				36	36	42	42				
Uncertainty	h[1]	h[1]	h[1,2]	h[13]	h[3,2]	h[1]	h[4]	h[3,2]	h[5,6]	h[7,1,8]	h[9,1,10]	h[1,10]	h[13]	h[13]	h[11]	h[12]

[1]Ref. [30]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [63]; [5]Ref. [126]; [6]Ref. [59]; [7]Ref. [60]; [8]Ref. [42]; [9]Ref. [93]; [10]Ref. [108]; [11]Ref. [7]; [12]Estimated values; [13]Calc. from other properties.

Methyl-tert-butylether $C_5H_{12}O$, $CH_3OC_4H_9$ (T_c = 503.4 K, p_c = 3.411 MPa, ρ_c = 275 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
331.2	101.3	706	3.4	−22.2	292.2	314.4	2.3	1.78	231	8.5	108	15.4	4.9	0.98	14.7	1.56
340	133	697	4.39	−1.7	306.6	308.3	2.35	1.83	214	8.76	106	16.2	4.76	0.99	13.8	1.62
360	234	673	7.51	46.5	339.8	293.3	2.46	1.95	184	9.38	100	18.2	4.53	1.01	11.7	1.76
380	386	649	12.2	96.6	373.7	277.1	2.57	2.08	151	10	94	20.3	4.12	1.02	9.8	1.96
400	602	623	18.9	143.7	407.8	259.1	2.69	2.23	129	10.7	89	22.5	3.92	1.06	7.9	2.17
420	897	591	28.5	203.1	441.8	238.7	2.83	2.39	109	11.5	83	24.9	3.73	1.1	6.1	2.55
440	1290	556	42.3	259.8	474.9	215.1	3.01	2.61	91	12.3	78	27.6	3.52	1.16	4.3	3.22
460	1800	517	62.7	319.2	505.4	186.3	3.27	2.95	74	13.3	71	30.7	3.36	1.28	2.7	4.12
480	2440	467	96.2	382	529.3	147.3	3.83	3.76	59	14.9	62	34.4	3.53	1.63	1.3	6.68
503.4	3411	275	275	488.1	488.1				44	44	47	47				
Uncertainty	h[1]	h[2]	h[3]	h[16]	h[3,4]	h[5,6]	h[7]	h[3,4]	h[8,9]	h[10,11]	h[12]	h[13,14]	h[16]	h[16]	h[13]	h[15]

[1]Ref. [26]; [2]Ref. [33]; [3]Ref. [52]; [4]Ref. [92]; [5]Ref. [13]; [6]Ref. [132]; [7]Ref. [5]; [8]Ref. [126]; [9]Ref. [62]; [10]Ref. [106]; [11]Ref. [107]; [12]Ref. [93]; [13]Ref. [89]; [14]Ref. [108]; [15]Estimated values; [16]Calc. from other properties.

n-Hexane C_6H_{14} (T_c = 507.82 K, p_c = 3.034 MPa, ρ_c = 233.2 kg/m^3)

T_s, K	P_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
300	21.87	653	0.768	−98.60	265.66	364.26	2.26	1.682	294.8	6.4	117.8	12.8	5.66	0.84	17.73	1.413
325	57.77	629.5	1.906	−40.70	306.52	347.22	2.371	1.809	235.2	6.9	109	15.1	5.12	0.83	15.05	1.53
341.86	101.33	613	3.231	0	334.93	334.93	2.452	1.901	203.7	7.3	103.5	16.8	4.83	0.82	13.3	1.631
350	129.92	604.8	4.086	20.14	348.84	328.71	2.493	1.948	190.4	7.5	101	17.7	4.7	0.82	12.48	1.689
375	258.2	578.6	7.87	84.18	392.27	308.09	2.626	2.101	155.6	8.1	93.6	20.4	4.37	0.83	10.01	1.911
400	466.1	550.1	14.05	151.72	436.28	284.56	2.774	2.275	127.8	8.8	87	23.2	4.08	0.87	7.68	2.238
425	780.3	518.2	23.81	223.16	480.06	256.9	2.948	2.485	105	9.8	81.1	26.3	3.82	0.93	5.49	2.76
450	1231.3	481.1	39.36	299.18	522.12	222.94	3.18	2.785	86	11.2	76	29.5	3.6	1.06	3.48	3.75
475	1856.7	433.6	66.1	381.51	559.07	177.57	3.606	3.4	69.9	13.2	71.5	32.9	3.52	1.37	1.7	6.34
507.82	3034	233.2	233.2	543.34	543.34				56.1	17.5	68	36			0.27	
Uncertainty	a[1]	a[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[1]	f[3]	e[4]	e[5]	e[6]	h[7]	h[7]	d[2]	d[1]

[1]Ref. [102]; [2]Ref. [101]; [3]Ref. [50]; [4]Ref. [25]; [5]Ref. [20]; [6]Ref. [15]; [7]Calc. from other properties.

Cyclohexane C_6H_{12} (T_c = 553.64 K, p_c = 4.075 MPa, ρ_c = 273.0 kg/m³)

T_s, K	p_s, kPa	ρ', kg/m³	ρ'', kg/m³	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
353.89	101.33	719.5	3.013	0	355.99	355.99	2.149	1.586	400	8.6	102	16.5	8.43	0.83	18	1.409
360	121.31	713.3	3.567	13.25	364.83	351.58	2.18	1.623	370	8.7	100	17.4	8.07	0.81	17.2	1.437
385	236.5	687.2	6.7	69.43	401.95	332.52	2.308	1.787	280	9.4	92.6	20.1	6.98	0.84	13	1.577
410	420.5	659.5	11.66	128.84	440.26	311.42	2.439	1.972	230	10.2	86.5	22.9	6.49	0.88	11	1.773
435	695.1	629.5	19.23	191.64	479.15	287.51	2.581	2.189	190	10.7	77.9	26	6.3	0.9	8.1	2.062
460	1084.5	596.1	30.6	258.14	517.81	259.67	2.745	2.465	160	11.6	69.2	30.4	6.35	0.94	5.2	2.52
485	1614.7	557.5	47.84	328.91	555.1	226.19	2.954	2.856	135	12.3	60.6	36.1	6.58	0.98	2	3.32
510	2315	510.5	75.19	404.95	589.18	184.23	3.267	3.509	115	13.6	56.5	39.4	6.65	1.21	1.5	4.96
535	3223.2	444.4	126	489.85	615.4	125.54	4.287	5.038	95	17.7	48.3	46	8.43	1.94	0.5	12.06
553.64	4075	273	273	596.89	596.89				54	54	57.9	57.9				
Uncertainty	a[1]	a[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[2,3]	h[4]	h[5,6]	h[7]	h[9]	h[9]	h[8]	d[1]

[1]Ref. [83]; [2]Ref. [17]; [3]Ref. [23]; [4]Ref. [105]; [5]Ref. [93]; [6]Ref. [71]; [7]Ref. [127]; [8]Ref. [12]; [9]Calc. from other properties.

Benzene C_6H_6 (T_c = 562.05 K, p_c = 4.895 MPa, ρ_c = 305.0 kg/m³)

T_s, K	p_s, kPa	ρ', kg/m³	ρ'', kg/m³	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
278.7	4.79	896.5	0.16	0	447.3	447.3	1.69		815						30.8	
300	13.81	872.2	0.44	36.7	469.9	433.2	1.75		587	7.83	140.5		7.3		28	1.17
325	38.81	844.3	1.14	81.3	495.5	414.2	1.82		428	8.49	132.3		5.9		24.7	1.26
353.3	101.5	812.9	2.79	134.3	528.2	393.9	1.92	1.29	321	9.26	122.9	14.8	5.02	0.81	21.1	1.36
400	352.3	759.2	9.02	228.5	585.4	356.9	2.1	1.53	205	10.7	119	19.8	3.62	0.83	15.5	1.66
450	971.6	694.3	24.4	339.3	648.2	308.9	2.3	1.81	138	12.5	106	26.7	2.99	0.85	9.88	2.37
475	1481.9	656	37.9	398.9	678.6	279.7	2.46	2.01	116	13.7	100	31	2.85	0.89	7.25	3.03
500	2166.4	610.9	57.9	461.9	706.7	244.8	2.66	2.32	97.6	15	93.5	35.7	2.78	0.97	4.79	4.19
525	3060.9	553.8	89.4	530	729.9	199.8	3.05	2.73	80.7	16.8	87.1	41.1	2.83	1.12	2.54	6.68
550	4215.5	465.5	151.1	609.6	738.7	129.1	4.26		59.6	19.1	77.4	50.2	3.28		0.63	16.48
Uncertainty	b[1]	b[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[2,3]	c[4,5]	d[5,6]	e[7,8]	e[8,9]	h[13]	h[13]	d[10, 11]	h[12]

[1]Ref. [28]; [2]Ref. [122]; [3]Ref. [18]; [4]Ref. [46]; [5]Ref. [125]; [6]Ref. [24]; [7]Ref. [3]; [8]Ref. [121]; [9]Ref. [108]; [10]Ref. [40]; [11]Refs. [100]; [12]Estimated values; [13]Calc. from other properties.

Phenol C_6H_6O (T_c = 693.2 K, p_c = 6.130 MPa, ρ_c = 435.7 kg/m³)

T_s, K	p_s, kPa	ρ', kg/m³	ρ'', kg/m³	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
455	101.3	955	2.6	−153	336	351	12.8	175	28.9	489	2.55	1.63	5.11	0.72	24.5	0.91
480	216	932	5.36	−93	374	256	13.5	170	31.6	467	2.61	1.74	3.93	0.74	20.9	1.02
505	404	905	9.88	−41	411	219	14.3	166	34.8	452	2.66	1.85	3.51	0.76	18.2	1.2
530	693	877	16.9	20	447	166	15.2	162	38.4	427	2.76	1.95	2.83	0.77	14.6	1.23
555	1100	851	27.2	80	482	137	16.2	157	42.4	402	2.85	2.06	2.59	0.79	12.4	1.63
580	1650	809	41.9	147	515	113	17.3	154	46.8	368	3.01	2.22	2.21	0.82	10.02	2.04
605	2360	772	62.9	206	545	90.1	18.6	149	51.4	339	3.1	2.44	1.87	0.88	7.6	2.63
635	3410	713	101	290	575	75.2	20.2	141	56.2	285	3.43	2.94	1.57	1.07	5.3	3.52
665	4720	636	170	399	587	65.3	23.4	130	64.3	188	3.77	5.1	1.89	1.86	2.7	10.39
693.15	6129	436	436	514	514				45.3	45.3	92	92				
Uncertainty	h[1]	h[2]	h[3]	h[16]	h[3,4]	h[5]	h[6]	h[3,7]	h[8]	h[9,10]	h[11]	h[12,13]	h[16]	h[16]	h[14]	h[15]

[1]Ref. [26]; [2]Ref. [127]; [3]Ref. [52]; [4]Ref. [48]; [5]Ref. [29]; [6]Ref. [67]; [7]Ref. [6]; [8]Ref. [71]; [9]Ref. [70]; [10]Ref. [107]; [11]Ref. [68]; [12]Ref. [69]; [13]Ref. [108]; [14]Ref. [73]; [15]Estimated values; [16]Calc. from other properties.

Aniline $C_6H_5NH_2$ (T_c = 699 K, p_c = 5.301 MPa, ρ_c = 340 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
457.5	101.3	875	2.56	−114	357	471	2.37	1.74	303	11.8	154	23.5	4.66	0.87	25.2	1.17
500	276	828	6.62	−10	427	437	2.52	1.89	213	13.1	146	28.1	3.68	0.88	19.9	1.34
525	456	800	10.7	53	468	415	2.61	1.99	178	13.9	141	30.9	3.29	0.89	16.9	1.48
550	716	769	16.7	137	509	372	2.71	2.09	152	14.7	136	33.8	3.03	0.91	14	1.65
575	1080	736	25.3	184	549	365	2.84	2.2	132	15.6	131	36.8	2.86	0.93	11.2	1.88
600	1560	699	37.5	154	589	335	2.97	2.35	117	16.5	126	40.1	2.76	0.97	8.5	2.21
625	2200	658	55.1	323	623	300	3.13	2.55	104	17.6	121	43.6	2.69	1.03	5.9	2.72
650	3010	608	81.7	396	653	257	3.36	2.9	94	19	116	47.8	2.72	1.5	3.6	3.65
675	4050	541	128	473	669	196	3.84	3.95	86	21.1	111	53.1	2.98	1.57	1.5	6.07
699	5300	340	340	584	584				71	71	70	70				
Uncertainty	h[1]	h[2]	h[3]	h[14]	h[3,4]	h[2]	h[5]	h[3,4]	h[6]	h[7,8]	h[9]	h[10,11]	h[14]	h[14]	h[12]	h[13]

[1]Ref. [125]; [2]Ref. [22]; [3]Ref. [52]; [4]Ref. [115]; [5]Ref. [63]; [6]Ref. [71]; [7]Ref. [70]; [8]Ref. [107]; [9]Ref. [68]; [10]Ref. [69]; [11]Ref. [108]; [12]Ref. [89]; [13]Estimated values; [14]Calc. from other properties.

n-Heptane C_7H_{16} (T_c = 540.13 K, p_c = 2.736 MPa, ρ_c = 232.0 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
371.53	101.33	614.2	3.471	0	316.89	316.89	2.558	2.028	201	7.3	98	18	5.25	0.82	12.5	1.559
380	129.1	606.1	4.369	21.85	332.52	310.67	2.599	2.076	186	7.7	95.5	18.4	5.06	0.87	11.8	1.617
400	218.25	586	7.228	74.89	369.98	295.09	2.701	2.193	159	8.3	88.8	20.1	4.84	0.91	10	1.785
420	348.5	564.6	11.424	130.03	407.99	277.96	2.81	2.32	135	9	82.9	22.6	4.58	0.92	8.3	2.013
440	530.7	541.3	17.46	187.43	446.19	258.76	2.93	2.462	115	9.7	76.1	24.9	4.43	0.96	6.6	2.34
460	777	515.3	26.08	247.33	484.07	236.74	3.072	2.632	97	10.7	69.9	27.7	4.26	1.02	5.1	2.841
480	1101.1	485.3	38.6	310.15	520.77	210.62	3.255	2.863	82	12.1	61.1	29.9	4.37	1.16	3.6	3.71
500	1519.1	448.2	57.74	376.79	554.66	177.87	3.549	3.257	67	14	52	33	4.57	1.38	2.2	5.56
520	2052.4	395.8	91.1	449.77	581.67	131.9	4.312	4.338	54	17.6	41.8	36	5.57	2.12	0.8	11.91
540.13	2736	232	232	562.23	562.23				41	41						
Uncertainty	a[1]	a[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[1]	h[1]	h[2,3]	h[2]	h[4]	h[4]	h[1]	d[1]

[1]Ref. [102]; [2]Ref. [22]; [3]Ref. [89]; [4]Calc. from other properties.

n-Octane C_8H_{18} (T_c = 569.32 K, p_c = 2.497 MPa, ρ_c = 234.9 kg/m^3)

T_s, K	P_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	H'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr$'$	Pr$''$	σ, 10^{-3} N/m	β, 10^{-3}/K
398.77	101.33	612.2	3.696	0	302.19	302.19	2.649	2.143	203	7.4	98	18.4	5.49	0.86	11.9	1.535
415	155.82	596.7	5.576	43.63	334.31	290.67	2.726	2.232	174	7.9	93	20.3	5.1	0.87	10.5	1.652
435	251.55	576.6	8.869	99.18	374.56	275.38	2.826	2.347	149	8.5	88	22.5	4.78	0.89	8.9	1.84
455	386.97	554.8	13.596	156.77	415.29	258.52	2.933	2.471	126	9.2	83	24.3	4.45	0.94	7.3	2.098
475	571.7	531	20.29	216.57	456.14	239.57	3.052	2.612	107	10	78	26.7	4.19	0.98	5.8	2.475
495	816.3	504	29.79	278.83	496.55	217.72	3.195	2.785	91	11.1	73	29.1	3.98	1.06	4.4	3.073
515	1133	472.3	43.61	344.02	535.57	191.55	3.39	3.031	75	12.5	68	31.6	3.74	1.2	2.9	4.16
535	1536.6	432	65.14	413.22	571.24	158.01	3.732	3.5	61	14.7	62	34.4	3.67	1.5	1.8	6.69
555	2047.6	370.7	105.7	489.95	597.73	107.78	4.905	5.241	48	19.4	56	38.6	4.2	2.63	0.6	18.07
569.32	2497	234.9	234.9	575.52	575.52						47.7	47.7				
Uncertainty	a[1]	a[1]	c[1]	c[1]	c[1]	c[1]	d[1]	d[1]	h[1]	h[1,4]	h[2,3]	h[2,3,5]	h[6]	h[6]	h[1]	d[1]

[1]Ref. [102]; [2]Ref. [110]; [3]Ref. [22]; [4]Ref. [42]; [5]Ref. [108]; [6]Calc. from other properties.

n-Nonane C_9H_{20} (T_c = 594.63 K, p_c = 2.289 MPa, ρ_c = 234 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
423.97	101.3	614	3.94	195	490	295	2.72	2.24	213	7.4	95	20.8	6.1	0.8	11.3	1.6
435	134	602	5.18	226	513	287	2.77	2.3	177	7.6	92	22	5.33	0.79	10.4	1.68
455	214	581	8.22	282	555	273	2.87	2.4	153	7.9	87	24.1	5.04	0.79	8.86	1.84
475	338	560	12.6	340	598	258	2.97	2.51	132	8.3	82	26.4	4.78	0.79	7.33	2.07
495	496	535	18.7	402	640	238	3.1	2.63	112	8.7	77	28.7	4.51	0.8	5.86	2.35
515	717	510	27.3	464	683	219	3.23	2.77	94	9.1	72	31.2	4.22	0.81	4.46	2.77
535	965	479	39.6	529	724	195	3.38	2.95	78	9.7	66	33.8	3.99	0.85	3.13	3.9
555	1320	444	58	594	762	168	3.59	3.25	63	10.6	60	36.6	3.77	0.94	1.9	4.56
575	1750	394	89.8	664	792	128	4	4.05	50	12.2	55	40	3.64	1.24	1.81	7.51
594.63	2289	234	234	754	754						49	49				
Uncertainty	h[1,2]	h[2]	h[3]	h[15]	h[3,4]	h[2]	h[5]	h[3,4]	h[6,7]	h[8,9]	h[10,11,12]	h[11,12]	h[15]	h[15]	h[13]	h[14]

[1]Ref. [27]; [2]Ref. [110]; [3]Ref. [52]; [4]Ref. [115]; [5]Ref. [63]; [6]Ref. [125]; [7]Ref. [126]; [8]Ref. [42]; [9]Ref. [93]; [10]Ref. [74]; [11]Ref. [108]; [12]Ref. [7]; [13]Estimated values; [14]Calc. from other properties.

n-Decane $C_{10}H_{22}$ (T_c = 617.6 K, p_c = 2.096 MPa, ρ_c = 235.9 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
447.31	101.3	621	4.13	265	542	277	2.79	2.33	205	8.1	91	21.8	6.29	0.87	10.64	1.61
460	141	608	5.6	299	569	270	2.85	2.39	180	8.3	88	23.1	5.83	0.86	9.68	1.66
480	227	588	8.73	357	613	256	2.94	2.49	149	8.7	83	25.3	5.28	0.86	8.2	1.88
500	329	564	13.2	416	658	242	3.06	2.59	127	9.1	78	27.5	4.98	0.86	6.77	2.09
520	479	538	19.4	476	702	226	3.16	2.71	108	9.6	73	29.8	4.68	0.87	5.39	2.35
540	675	513	28.1	538	746	208	3.29	2.85	91	10.1	68	32.1	4.4	0.9	4.07	2.81
560	927	479	40.7	603	789	186	3.44	3.03	75	10.7	63	34.7	4.1	0.93	2.83	3.53
580	1250	445	59.6	673	829	156	3.65	3.33	61	11.6	58	37.5	3.84	1.03	1.68	4.73
600	1650	392	93.1	743	859	116	4.06	4.2	48	13.3	54	40.9	3.61	1.37	0.67	8.08
617.6	2096	235.9	235.9	824	824						49	49				
Uncertainty	h[1,2]	h[2]	h[3]	h[15]	h[3,4]	h[2]	h[5]	h[3,4]	h[6,7]	h[8,9]	h[10,11,12]	h[11,12]	h[15]	h[15]	h[13]	h[14]

[1]Ref. [27]; [2]Ref. [110]; [3]Ref. [52]; [4]Ref. [115]; [5]Ref. [63]; [6]Ref. [126]; [7]Ref. [59]; [8]Ref. [135]; [9]Ref. [42]; [10]Ref. [93]; [11]Ref. [74]; [12]Ref. [108]; [12]Ref. [7]; [13]Estimated values; [14]Calc. from other properties.

Ethylbenzene C_8H_{10}, C_6H_5–CH_2CH_3 (T_c = 617.1 K, p_c = 3.610 MPa, ρ_c = 284 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
409.3	101.3	751	3.26	−42.8	298.8	341.6	1.98	1.67	230	9	99	16.9	4.6	0.87	16.6	1.35
433	189	727	5.76	9	335.6	326.6	2.04	1.77	197	9.6	95	19.4	4.31	0.88	14.5	1.47
453	297	705	8.88	53.3	367.3	314	2.11	1.86	176	10.3	90	21.5	4.13	0.89	12.5	1.6
473	447	682	13.2	101.6	399.3	297.7	2.19	1.95	158	11	85	23.6	4.07	0.91	10.5	1.75
493	645	657	29	159.3	431.4	272.1	2.28	2.05	142	11.7	80	25.9	4.05	0.93	8.8	1.95
513	903	630	26.9	207.9	463.3	255.4	2.38	2.16	129	12.4	75	28.2	4.09	0.95	7.1	2.21
553	1640	568	52.1	306.7	524.4	217.7	2.63	2.48	108	13.7	65	33.2	4.37	1.02	3.9	3.13
573	2150	529	72.9	368.2	550.8	192.6	2.85	2.78	99	14.8	60	36.1	4.7	1.14	2.5	4.09
593	2770	478	106	427.8	570.2	142.4	3.22	3.52	91	16.6	55	39.5	5.32	1.48	1.2	6.29
613	3450	388	189	481.6	557	75.4	4.2	17.5	84	22.6	50	45.8	7.02	8.64	0.23	
Uncertainty	h[1]	h[1]	h[2]	h[14]	h[3,2]	h[4]	h[5]	h[3,2]	h[6]	h[7,8]	h[9]	h[10,11]	h[14]	h[14]	h[12]	h[13]

[1]Ref. [110]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [29]; [5]Ref. [67]; [6]Ref. [71]; [7]Ref. [70]; [8]Ref. [42]; [9]Ref. [68]; [10]Ref. [74]; [11]Ref. [108]; [12]Ref. [73]; [13]Estimated values; [14]Calc. from other properties.

Toluene C_7H_8, $C_6H_5CH_3$ (T_c = 591.75 K, p_c = 4.126 MPa, ρ_c = 292.0 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
320	10.73	841.66	0.374	−120.29	279.68	399.96	1.773	1.221	434.4	7.6	123	7.1	6.26	1.31	25.44	1.124
350	34.82	812.87	1.124	−65.51	316.49	382	1.878	1.348	327.4	8.3	115	8.9	5.35	1.26	22.06	1.202
383.75	101.33	779.14	3.05	0	360.7	360.7	2.003	1.496	247.7	9.1	106.8	11.1	4.65	1.23	18.38	1.323
410	202.14	751.46	5.847	53.98	396.7	342.72	2.105	1.616	203.2	9.7	101.1	13	4.23	1.2	15.6	1.455
440	396.98	717.63	11.17	119.04	438.98	319.94	2.228	1.762	164.3	10.4	95	15.2	3.85	1.2	12.54	1.666
470	709.05	680.44	19.83	187.96	481.72	293.75	2.365	1.926	134.2	11.5	89.4	17.4	3.55	1.27	9.6	1.99
500	1176.62	638.14	33.64	261.19	523.74	262.55	2.529	2.132	110.5	11.7	84.3	19.8	3.31	1.26	6.83	2.54
530	1844.36	587.26	56.18	339.64	562.96	223.32	2.762	2.453	91.5	12.4	79.5	22.3	3.18	1.37	4.24	3.65
560	2769.1	519.05	96.97	425.67	594.41	168.74	3.259	3.269	76.1	13.1	75.1	25.4	3.3	1.68	1.93	6.99
591.75	4126.3	291.99	291.99	565.77	565.77				63.5	13.8	71	34.1			0.11	
Uncertainty	a[1]	a[1]	b[1]	c[1]	c[1]	c[1]	d[1]	d[1]	e[2]	f[3]	e[4]	h[5,6]	h[8]	h[8]	d[7]	d[1]

[1]Ref. [58]; [2]Ref. [103]; [3]Ref. [15]; [4]Ref. [64]; [5]Ref. [135]; [6]Ref. [108]; [7]Ref. [134]; [8]Calc. from other properties.

m-Xylol C_8H_{10}, $C_6H_4(CH_3)_2$ (T_c = 617 K, p_c = 3.543 MPa, ρ_c = 283 kg/m^3)

T_s, K	P_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	H', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
412	101.3	752	3.22	−34.6	310.8	345.4	2.13	1.66	232	9.1	92	16.9	5.38	0.89	16.7	1.38
430	162	731	4.98	−1.2	337.9	339.1	2.19	1.73	207	9.5	88	19.4	5.18	0.85	14.8	1.46
455	281	700	8.69	50.2	376.8	326.6	2.29	1.84	182	10	82	22.1	5.08	0.83	12.5	1.61
480	472	673	14.3	114.7	416.1	301.4	2.4	1.95	158	10.7	77	24.6	4.92	0.85	10.2	1.83
505	741	642	22.6	172.6	455.2	282.6	2.54	2.08	135	11.4	72	27.2	4.76	0.87	8	2.11
530	1121	604	34.6	233.9	493.5	259.6	2.69	2.24	112	12.2	67	29.9	4.54	0.91	5.9	2.52
555	1601	570	52.6	299.2	529.5	230.3	2.87	2.47	90	13.2	62	33.1	4.17	0.99	3.9	3.25
580	2264	505	81.3	371.4	559.8	188.4	3.16	2.91	71	14.6	57	37.1	3.94	1.15	2.1	4.59
605	3052	396	140	460.6	571.1	100.5	3.86	5.27	55	18.3	52	42.2	4.08	2.29	0.5	9.48
617	3543	283	283	516.7	516.7				54	54	50	50				
Uncertainty	h[1,2]	h[3]	h[4]	h[14]	h[4,5]	h[3]	h[6]	h[4,5]	h[3,7]	h[3,8]	h[3,9]	h[3,10]	h[13]	h[13]	h[3,11]	h[12]

[1]Ref. [125]; [2]Ref. [110]; [3]Ref. [22]; [4]Ref. [52]; [5]Ref. [115]; [6]Ref. [63]; [7]Ref. [59]; [8]Ref. [42]; [9]Ref. [93]; [10]Ref. [108]; [11]Ref. [89]; [12]Estimated values; [13]Calc. from other properties.

o-Xylol C_8H_{10}, $C_6H_4(CH_3)_2$ (T_c = 630.4 K, p_c = 3.729 MPa, ρ_c = 288 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
417.56	101.3	764	3.17	6.5	349.9	343.4	2.16	1.71	253	9.2	99	18.4	5.51	0.86	17.9	1.31
430	142	751	4.31	30.4	369.5	339.1	2.2	1.76	231	9.5	96	19.3	5.28	0.87	16.4	1.37
455	249	725	7.54	83.2	409.8	326.6	2.3	1.86	197	10.2	91	21.9	5	0.87	14.1	1.51
480	422	696	12.5	145	450.5	305.5	2.4	1.97	171	10.8	85	24.4	4.83	0.88	11.4	1.69
505	655	666	19.6	201.7	491.4	289.7	2.52	2.08	147	11.5	80	27	4.65	0.89	9.2	1.92
530	995	632	30	263.7	531.7	268	2.65	2.22	124	12.2	74	29.9	4.43	0.91	7	2.24
555	1420	594	45.1	331	570.5	239.5	2.81	2.4	102	13.1	69	33	4.14	0.95	4.9	2.75
580	2040	549	67.8	400.6	605.8	205.2	3.02	2.7	82	14.3	63	36.5	3.92	1.06	3	3.67
605	2750	489	107	476.9	631.8	154.9	3.44	3.49	65	16.3	58	40.6	3.87	1.4	1.3	5.99
630.4	3729	288	288	581.2	581.2				55	55	52	52				
Uncertainty	h[1,2]	h[3]	h[4]	h[14]	h[4,5]	h[3]	h[6]	h[4,7]	h[3,8]	h[3,9]	h[3,10]	h[3,11]	h[14]	h[14]	h[3,12]	h[13]

[1]Ref. [125]; [2]Ref. [110]; [3]Ref. [22]; [4]Ref. [52]; [5]Ref. [29]; [6]Ref. [63]; [7]Ref. [115]; [8]Ref. [59]; [9]Ref. [42]; [10]Ref. [93]; [11]Ref. [108]; [12]Ref. [89]; [13]Estimated values; [14]Calc. from other properties.

p-Xylol C_8H_{10}, $CH_4(CH_3)_2$ (T_c = 616.3 K, p_c = 3.510 MPa, ρ_c = 280 kg/m^3)

T_s, K	p_s, kPa	ρ', kg/m^3	ρ'', kg/m^3	h', kJ/kg	h'', kJ/kg	Δh_v, kJ/kg	c_p', kJ/(kg K)	c_p'', kJ/(kg K)	η', 10^{-6} kg/(m s)	η'', 10^{-6} kg/(m s)	λ', 10^{-3} W/(m K)	λ'', 10^{-3} W/(m K)	Pr′	Pr″	σ, 10^{-3} N/m	β, 10^{-3}/K
412	101.3	753	3.23	−35.7	309.7	354.4	2.11	1.64	232	8.8	98	17.1	5	0.84	16	1.57
430	161	734	5.08	−2.4	337.7	339.1	2.18	1.72	205	9.5	93	19.7	4.81	1.83	14.2	1.69
455	287	706	8.83	49.7	376.3	326.6	2.27	1.83	176	1.01	87	22.1	4.59	0.84	11.8	1.72
480	476	676	14.5	113.8	415.2	301.4	2.39	1.94	155	10.7	81	24.6	4.57	0.84	10	1.77
505	752	643	22.8	171.4	454	282.6	2.52	2.07	132	11.4	75	27.2	4.44	0.87	7.8	2.24
530	1120	607	34.9	232.3	491.9	259.6	2.67	2.23	109	12.2	69	30	4.22	0.91	5.7	2.44
555	1590	565	52.9	297.2	527.5	230.3	2.86	2.46	89	13.1	63	33	4.04	0.98	3.8	3.65
580	2270	513	81.8	368.9	557.3	188.4	3.15	2.92	70	14.6	57	37.1	3.87	1.15	2	8.38
605	3100	432	142	466.7	567.2	100.5	3.88	5.51	54	18	52	42.3	4.03	2.34	0.5	24.5
616.3	3510	280	280	514	514				53	53	49	49				
Uncertainty	h[1]	h[2]	h[3]	h[13]	h[3,4]	h[2]	h[2,5]	h[3,4]	h[2,6]	h[2,7]	h[2,8]	h[2,9]	h[12]	h[12]	h[2,10]	h[11]

[1]Refs. [22, 125]; [2]Ref. [52]; [3]Ref. [115]; [4]Ref. [63]; [5]Ref. [59]; [6]Ref. [42]; [7]Ref. [93]; [8]Ref. [108]; [9]Ref. [89]; [10]Estimated values; [11]Calc. from other properties.

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