TABLE 2-30 Densities of Inorganic and Organic Liquids

Cmpd. no.	Name	Formula	CAS no.	Mol. wt.	C1	C2	C3	C4	T_{min}, K	Density at T_{min}	T_{max}, K	Density at T_{max}
1	Methane	CH_4	74828	16.043	2.9214	0.28976	190.56	0.28881	90.69	28.18	190.56	10.082
2	Ethane	C_2H_6	74840	30.070	1.9122	0.27937	305.32	0.29187	90.35	21.64	305.32	6.845
3	Propane	C_3H_8	74986	44.097	1.3757	0.27453	369.83	0.29359	85.47	16.583	369.83	5.011
4	*n*-Butane	C_4H_{10}	106978	58.123	1.0677	0.27188	425.12	0.28688	134.86	12.62	425.12	3.927
5	*n*-Pentane	C_5H_{12}	109660	72.150	0.84947	0.26726	469.7	0.27789	143.42	10.474	469.7	3.178
6	*n*-Hexane	C_6H_{14}	110543	86.177	0.70824	0.26411	507.6	0.27537	177.83	8.747	507.6	2.682
7	*n*-Heptane	C_7H_{16}	142825	100.204	0.61259	0.26211	540.2	0.28141	182.57	7.6998	540.2	2.337
8	*n*-Octane	C_8H_{18}	111659	114.231	0.53731	0.26115	568.7	0.28034	216.38	6.6558	568.7	2.058
9	*n*-Nonane	C_9H_{20}	111842	128.258	0.48387	0.26147	594.6	0.28281	219.66	6.007	594.6	1.851
10	*n*-Decane	$C_{10}H_{22}$	124185	142.285	0.42831	0.25745	617.7	0.28912	243.51	5.3811	617.7	1.664
11	*n*-Undecane	$C_{11}H_{24}$	1120214	156.312	0.39	0.25678	639	0.2913	247.57	4.9362	639	1.519
12	*n*-Dodecane	$C_{12}H_{26}$	112403	170.338	0.35541	0.25511	658	0.29368	263.57	4.5132	658	1.393
13	*n*-Tridecane	$C_{13}H_{28}$	629505	184.365	0.3216	0.2504	675	0.3071	267.76	4.2035	675	1.284
14	*n*-Tetradecane	$C_{14}H_{30}$	629594	198.392	0.30545	0.2535	693	0.30538	279.01	3.8924	693	1.205
15	*n*-Pentadecane	$C_{15}H_{32}$	629629	212.419	0.28445	0.25269	708	0.30786	283.07	3.6471	708	1.126
16	*n*-Hexadecane	$C_{16}H_{34}$	544763	226.446	0.26807	0.25287	723	0.31143	291.31	3.4187	723	1.060
17	*n*-Heptadecane	$C_{17}H_{36}$	629787	240.473	0.2545	0.254	736	0.31072	295.13	3.2241	736	1.002
18	*n*-Octadecane	$C_{18}H_{38}$	593453	254.500	0.23864	0.25272	747	0.31104	301.31	3.0466	747	0.944
19	*n*-Nonadecane	$C_{19}H_{40}$	629925	268.527	0.22451	0.25133	758	0.3133	305.04	2.8933	758	0.893
20	*n*-Eicosane	$C_{20}H_{42}$	112958	282.553	0.21624	0.25287	768	0.31613	309.58	2.7496	768	0.855
21	2-Methylpropane	C_4H_{10}	75285	58.123	1.0463	0.27294	408.14	0.27301	113.54	12.575	408.14	3.833
22	2-Methylbutane	C_5H_{12}	78784	72.150	0.9079	0.2761	460.43	0.28673	113.25	10.776	460.43	3.288
23	2,3-Dimethylbutane	C_6H_{14}	79298	86.177	0.76929	0.27524	499.98	0.27691	145.19	9.0343	499.98	2.795
24	2-Methylpentane	C_6H_{14}	107835	86.177	0.73335	0.2687	497.5	0.28361	119.55	9.2041	497.5	2.729
25	2,3-Dimethylpentane	C_7H_{16}	565593	100.204	0.7229	0.28614	537.35	0.2713	160.00	7.8746	537.35	2.526
26	2,3,3-Trimethylpentane	C_8H_{18}	560214	114.231	0.6028	0.27446	573.5	0.2741	172.22	7.0934	573.5	2.196
27	2,2,4-Trimethylpentane	C_8H_{18}	540841	114.231	0.5886	0.27373	543.96	0.2846	165.78	6.9163	543.96	2.150
28	Ethylene	C_2H_4	74851	28.054	2.0961	0.27657	282.34	0.29147	104.00	23.326	282.34	7.579
29	Propylene	C_3H_6	115071	42.081	1.4094	0.26465	365.57	0.295	87.89	18.143	365.57	5.326
30	1-Butene	C_4H_8	106989	56.108	1.0972	0.2649	419.95	0.29043	87.80	14.326	419.95	4.142
31	*cis*-2-Butene	C_4H_8	590181	56.108	1.1609	0.27104	435.58	0.2816	134.26	13.895	435.58	4.283
32	*trans*-2-Butene	C_4H_8	624646	56.108	1.1426	0.27095	428.63	0.2854	167.62	13.1	428.63	4.217
33	1-Pentene	C_5H_{10}	109671	70.134	0.9038	0.26648	464.78	0.2905	107.93	11.543	464.78	3.392
34	1-Hexene	C_6H_{12}	592416	84.161	0.7389	0.26147	504.03	0.2902	133.39	9.6388	504.03	2.826
35	1-Heptene	C_7H_{14}	592767	98.188	0.63734	0.26319	537.29	0.27375	154.27	8.1759	537.29	2.422
36	1-Octene	C_8H_{16}	111660	112.215	0.5871	0.27005	566.65	0.27187	171.45	7.1247	566.65	2.174
37	1-Nonene	C_9H_{18}	124118	126.242	0.4945	0.26108	593.25	0.27319	191.78	6.333	593.25	1.894
38	1-Decene	$C_{10}H_{20}$	872059	140.269	0.44244	0.25838	616.4	0.28411	206.89	5.7131	616.4	1.712
39	2-Methylpropene	C_4H_8	115117	56.108	1.1454	0.2725	417.9	0.28186	132.81	13.506	417.9	4.203
40	2-Methyl-1-butene	C_5H_{10}	563462	70.134	0.91619	0.26752	465	0.28164	135.58	11.332	465	3.425
41	2-Methyl-2-butene	C_5H_{10}	513359	70.134	0.93322	0.27251	471	0.26031	139.39	11.218	471	3.425
42	1,2-Butadiene	C_4H_6	590192	54.092	1.187	0.26114	452	0.3065	136.95	15.123	452	4.546
43	1,3-Butadiene	C_4H_6	106990	54.092	1.2384	0.2725	425.17	0.28813	164.25	14.061	425.17	4.545
44	2-Methyl-1,3-butadiene[1]	C_5H_8	78795	68.119	0.95673	0.26488	484	0.28571	127.27	12.205	484	3.612
45	Acetylene	C_2H_2	74862	26.038	2.4091	0.27223	308.32	0.28477	192.40	23.692	308.32	8.850
46	Methylacetylene	C_3H_4	74997	40.065	1.6086	0.26448	402.39	0.279	170.45	19.027	402.39	6.082
47	Dimethylacetylene	C_4H_6	503173	54.092	1.1717	0.25895	473.2	0.27289	240.91	13.767	473.2	4.525
48	3-Methyl-1-butyne	C_5H_8	598232	68.119	0.94575	0.26008	463.2	0.30807	183.45	11.519	463.2	3.636
49	1-Pentyne	C_5H_8	627190	68.119	0.8491	0.2352	481.2	0.353	167.45	12.532	481.2	3.610
50	2-Pentyne	C_5H_8	627214	68.119	0.92099	0.25419	519	0.31077	163.83	12.24	519	3.623
51	1-Hexyne	C_6H_{10}	693027	82.145	0.84427	0.27185	516.2	0.2771	141.25	10.23	516.2	3.106
52	2-Hexyne	C_6H_{10}	764352	82.145	0.76277	0.25248	549	0.31611	183.65	10.133	549	3.021
53	3-Hexyne[1]	C_6H_{10}	928494	82.145	0.78045	0.26065	544	0.28571	170.05	10.021	544	2.994

54	1-Heptyne	C_7H_{12}	628717	96.172	0.67366	0.26003	559	0.29804	192.22	8.4987	559	2.591
55	1-Octyne	C_8H_{14}	629050	110.199	0.59229	0.26118	585	0.29357	193.55	7.478	585	2.268
56	Vinylacetylene[2]	C_4H_4	689974	52.076	1.2703	0.26041	454	0.297	173.15	15.664	454	4.878
57	Cyclopentane	C_5H_{10}	287923	70.134	1.124	0.28859	511.76	0.2506	179.28	11.883	511.76	3.895
58	Methylcyclopentane	C_6H_{12}	96377	84.161	0.84798	0.27042	532.79	0.28276	130.73	10.492	532.79	3.136
59	Ethylcyclopentane	C_7H_{14}	1640897	98.188	0.7193	0.26936	569.52	0.2777	134.71	9.018	569.52	2.670
60	Cyclohexane	C_6H_{12}	110827	84.161	0.8908	0.27396	553.58	0.2851	279.69	9.3797	553.58	3.252
61	Methylcyclohexane	C_7H_{14}	108872	98.188	0.735	0.27041	572.19	0.2927	146.58	9.018	572.19	2.718
62	1,1-Dimethyl-cyclohexane	C_8H_{16}	590669	112.215	0.55873	0.25143	591.15	0.27758	239.66	7.3417	591.15	2.222
63	Ethylcyclohexane	C_8H_{16}	1678917	112.215	0.61587	0.26477	609.15	0.28054	161.84	7.8679	609.15	2.326
64	Cyclopentene	C_5H_8	142290	68.119	1.1035	0.27035	507	0.28699	138.13	13.47	507	4.082
65	1-Methylcyclopentene	C_6H_{10}	693890	82.145	0.88824	0.26914	542	0.27874	146.62	10.98	542	3.300
66	Cyclohexene	C_6H_{10}	110838	82.145	0.92997	0.27056	560.4	0.28943	169.67	11.16	560.4	3.437
67	Benzene	C_6H_6	71432	78.114	1.0162	0.2655	562.16	0.28212	278.68	11.421	562.16	3.828
68	Toluene	C_7H_8	108883	92.141	0.8488	0.26655	591.8	0.2878	178.18	10.495	591.8	3.184
69	*o*-Xylene	C_8H_{10}	95476	106.167	0.69883	0.26113	630.33	0.27429	247.98	8.6285	630.33	2.676
70	*m*-Xylene	C_8H_{10}	108383	106.167	0.69555	0.26204	617.05	0.27602	225.30	8.6505	617.05	2.654
71	*p*-Xylene	C_8H_{10}	106423	106.167	0.6816	0.25963	616.23	0.2768	286.41	8.1616	616.23	2.625
72	Ethylbenzene	C_8H_{10}	100414	106.167	0.6952	0.26037	617.2	0.2844	178.15	9.0568	617.2	2.670
73	Propylbenzene	C_9H_{12}	103651	120.194	0.57695	0.25395	638.32	0.283	183.15	7.8942	638.32	2.272
74	1,2,4-Trimethylbenzene	C_9H_{12}	95636	120.194	0.60394	0.25955	649.13	0.27716	229.33	7.6895	649.13	2.327
75	Isopropylbenzene	C_9H_{12}	98828	120.194	0.604	0.25912	631.1	0.2914	177.14	7.9496	631.1	2.331
76	1,3,5-Trimethylbenzene	C_9H_{12}	108678	120.194	0.59879	0.25916	637.36	0.27968	228.42	7.6154	637.36	2.311
77	*p*-Isopropyltoluene	$C_{10}H_{14}$	99876	134.221	0.51036	0.25383	653.15	0.28816	205.25	6.8779	653.15	2.011
78	Naphthalene[6]	$C_{10}H_8$	91203	128.174	0.61674	0.25473	748.35	0.27355	333.15	7.7543	748.35	2.421
79	Biphenyl	$C_{12}H_{10}$	92524	154.211	0.5039	0.25273	789.26	0.281	342.20	6.4395	789.26	1.994
80	Styrene	C_8H_8	100425	104.152	0.7397	0.2603	636	0.3009	242.54	9.1088	636	2.842
81	*m*-Terphenyl	$C_{18}H_{14}$	92068	230.309	0.30826	0.23669	924.85	0.29678	360.00	4.5223	924.85	1.302
82	Methanol	CH_4O	67561	32.042	2.288	0.2685	512.64	0.2453	175.47	27.912	512.64	8.521
83	Ethanol	C_2H_6O	64175	46.069	1.648	0.27627	513.92	0.2331	159.05	19.413	513.92	5.965
84	1-Propanol	C_3H_8O	71238	60.096	1.235	0.27136	536.78	0.24	146.95	15.231	536.78	4.551
85	1-Butanol	$C_4H_{10}O$	71363	74.123	0.965	0.2666	563.05	0.24419	184.51	12.016	563.05	3.620
86	2-Butanol	$C_4H_{10}O$	78922	74.123	0.966	0.26064	536.05	0.2746	158.45	12.57	536.05	3.706
87	2-Propanol	C_3H_8O	67630	60.096	1.24	0.27342	508.3	0.2353	185.28	14.547	508.3	4.535
88	2-Methyl-2-propanol	$C_4H_{10}O$	75650	74.123	0.9212	0.2544	506.21	0.276	298.97	10.555	506.21	3.621
89	1-Pentanol	$C_5H_{12}O$	71410	88.150	0.8164	0.2673	586.15	0.2506	195.56	10.057	586.15	3.054
90	2-Methyl-1-butanol	$C_5H_{12}O$	137326	88.150	0.82046	0.26829	565	0.2322	203.00	10.017	565	3.058
91	3-Methyl-1-butanol	$C_5H_{12}O$	123513	88.150	0.837	0.27375	577.2	0.22951	155.95	10.204	577.2	3.058
92	1-Hexanol	$C_6H_{14}O$	111273	102.177	0.70617	0.26901	611.35	0.2479	228.55	8.4506	611.35	2.625
93	1-Heptanol	$C_7H_{16}O$	111706	116.203	0.60481	0.2632	631.9	0.273	239.15	7.421	631.9	2.298
94	Cyclohexanol	$C_6H_{12}O$	108930	100.161	0.8243	0.26546	650	0.2848	296.60	9.4693	650	3.105
95	Ethylene glycol	$C_2H_6O_2$	107211	62.068	1.3151	0.25125	719.7	0.2187	260.15	18.31	719.7	5.234
96	1,2-Propylene glycol	$C_3H_8O_2$	57556	76.095	1.0923	0.26106	626	0.20459	213.15	14.363	626	4.184
97	Phenol	C_6H_6O	108952	94.113	1.3798	0.31598	694.25	0.32768	314.06	11.244	694.25	4.367
98	*o*-Cresol	C_7H_8O	95487	108.140	1.0861	0.30624	697.55	0.30587	304.19	9.5751	697.55	3.547
99	*m*-Cresol	C_7H_8O	108394	108.140	0.9061	0.28268	705.85	0.2707	285.39	9.6115	705.85	3.205
100	*p*-Cresol	C_7H_8O	106445	108.140	1.1503	0.31861	704.65	0.30104	307.93	9.4494	704.65	3.610
101	Dimethyl ether	C_2H_6O	115106	46.069	1.5693	0.2679	400.1	0.2882	131.65	18.95	400.1	5.858
102	Methyl ethyl ether	C_3H_8O	540670	60.096	1.2635	0.27878	437.8	0.2744	160.00	13.995	437.8	4.532
103	Methyl-*n*-propyl ether	$C_4H_{10}O$	557175	74.123	1.0124	0.27942	476.3	0.2555	133.97	11.696	476.3	3.623
104	Methyl isopropyl ether	$C_4H_{10}O$	598538	74.123	1.0318	0.28478	464.5	0.2444	127.93	11.568	464.5	3.623
105	Methyl-*n*-butyl ether	$C_5H_{12}O$	628284	88.150	0.8281	0.27245	510	0.2827	157.48	9.8068	510	3.040
106	Methyl isobutyl ether[1]	$C_5H_{12}O$	625445	88.150	0.8252	0.27282	497	0.2857	150.00	9.7673	497	3.025
107	Methyl tert-butyl ether	$C_5H_{12}O$	1634044	88.150	0.82157	0.27032	497.1	0.2829	164.55	9.7682	497.1	3.039
108	Diethyl ether	$C_4H_{10}O$	60297	74.123	0.9554	0.26847	466.7	0.2814	156.85	11.487	466.7	3.559

TABLE 2-30 Densities of Inorganic and Organic Liquids (*Continued*)

Cmpd. no.	Name	Formula	CAS no.	Mol. wt.	C1	C2	C3	C4	T_{min}, K	Density at T_{min}	T_{max}, K	Density at T_{max}
109	Ethyl propyl ether	$C_5H_{12}O$	628320	88.150	0.7908	0.266	500.23	0.292	145.65	9.8474	500.23	2.973
110	Ethyl isopropyl ether	$C_5H_{12}O$	625547	88.150	0.82049	0.26994	489	0.30381	140.00	9.9117	489	3.040
111	Methyl phenyl ether	C_7H_8O	100663	108.140	0.77488	0.26114	645.6	0.28234	235.65	9.6675	645.6	2.967
112	Diphenyl ether	$C_{12}H_{10}O$	101848	170.211	0.52133	0.26218	766.8	0.31033	300.03	6.2648	766.8	1.988
113	Formaldehyde[3]	CH_2O	50000	30.026	1.9415	0.22309	408	0.28571	181.15	30.945	408	8.703
114	Acetaldehyde	C_2H_4O	75070	44.053	1.6994	0.26167	466	0.2913	150.15	21.499	466	6.494
115	1-Propanal	C_3H_6O	123386	58.080	1.296	0.26439	504.4	0.29471	170.00	15.929	504.4	4.902
116	1-Butanal	C_4H_8O	123728	72.107	1.0361	0.26731	537.2	0.28397	176.75	12.589	537.2	3.876
117	1-Pentanal	$C_5H_{10}O$	110623	86.134	0.83871	0.26252	566.1	0.29444	182.00	10.534	566.1	3.195
118	1-Hexanal	$C_6H_{12}O$	66251	100.161	0.71899	0.26531	591	0.27628	217.15	8.7243	591	2.710
119	1-Heptanal	$C_7H_{14}O$	111717	114.188	0.62649	0.26376	617	0.29221	229.80	7.6002	617	2.375
120	1-Octanal	$C_8H_{16}O$	124130	128.214	0.56833	0.26939	638.1	0.26975	246.00	6.6637	638.1	2.110
121	1-Nonanal	$C_9H_{18}O$	124196	142.241	0.49587	0.26135	658	0.30736	255.15	6.0165	658	1.897
122	1-Decanal	$C_{10}H_{20}O$	112312	156.268	0.46802	0.27146	674.2	0.26869	267.15	5.3834	674.2	1.724
123	Acetone	C_3H_6O	67641	58.080	1.2332	0.25886	508.2	0.2913	178.45	15.683	508.2	4.764
124	Methyl ethyl ketone	C_4H_8O	78933	72.107	0.93767	0.25035	535.5	0.29964	186.48	12.663	535.5	3.745
125	2-Pentanone	$C_5H_{10}O$	107879	86.134	0.90411	0.27207	561.08	0.30669	196.29	10.398	561.08	3.323
126	Methyl isopropyl ketone[1]	$C_5H_{10}O$	563804	86.134	0.8374	0.26204	553	0.2857	181.15	10.565	553	3.196
127	2-Hexanone	$C_6H_{12}O$	591786	100.161	0.70659	0.26073	587.05	0.2963	217.35	8.7505	587.05	2.710
128	Methyl isobutyl ketone	$C_6H_{12}O$	108101	100.161	0.71791	0.26491	571.4	0.28544	189.15	8.8579	571.4	2.710
129	3-Methyl-2-pentanone[1]	$C_6H_{12}O$	565617	100.161	0.6969	0.2587	573	0.2857	167.15	9.1722	573	2.694
130	3-Pentanone	$C_5H_{10}O$	96220	86.134	0.71811	0.24129	560.95	0.27996	234.18	10.102	560.95	2.976
131	Ethyl isopropyl ketone	$C_6H_{12}O$	565695	100.161	0.66469	0.24527	567	0.34305	200.00	9.0933	567	2.710
132	Diisopropyl ketone	$C_7H_{14}O$	565800	114.188	0.56213	0.23385	576	0.2618	204.81	8.7779	576	2.404
133	Cyclohexanone	$C_6H_{10}O$	108941	98.145	0.8663	0.26941	653	0.2977	242.00	10.081	653	3.216
134	Methyl phenyl ketone	C_8H_8O	98862	120.151	0.64417	0.24863	709.5	0.28661	292.81	8.5581	709.5	2.591
135	Formic acid	CH_2O_2	64186	46.026	1.938	0.24225	588	0.24435	281.45	26.806	588	8.000
136	Acetic acid	$C_2H_4O_2$	64197	60.053	1.4486	0.25892	591.95	0.2529	289.81	17.492	591.95	5.595
137	Propionic acid	$C_3H_6O_2$	79094	74.079	1.1041	0.25659	600.81	0.26874	252.45	13.933	600.81	4.303
138	*n*-Butyric acid	$C_4H_8O_2$	107926	88.106	0.89213	0.25938	615.7	0.24909	267.95	11.087	615.7	3.440
139	Isobutyric acid	$C_4H_8O_2$	79312	88.106	0.88575	0.25736	605	0.26265	227.15	11.42	605	3.442
140	Benzoic acid[1]	$C_7H_6O_2$	65850	122.123	0.71587	0.24812	751	0.2857	395.45	8.8935	751	2.885
141	Acetic anhydride	$C_4H_6O_3$	108247	102.090	0.86852	0.25187	606	0.31172	200.15	11.643	606	3.448
142	Methyl formate	$C_2H_4O_2$	107313	60.053	1.525	0.2634	487.2	0.2806	174.15	18.811	487.2	5.790
143	Methyl acetate	$C_3H_6O_2$	79209	74.079	1.13	0.2593	506.55	0.2764	175.15	14.475	506.55	4.358
144	Methyl propionate	$C_4H_8O_2$	554121	88.106	0.9147	0.2594	530.6	0.2774	185.65	11.678	530.6	3.526
145	Methyl *n*-butyrate	$C_5H_{10}O_2$	623427	102.133	0.76983	0.26173	554.5	0.26879	187.35	9.7638	554.5	2.941
146	Ethyl formate	$C_3H_6O_2$	109944	74.079	1.1343	0.26168	508.4	0.2791	193.55	14.006	508.4	4.335
147	Ethyl acetate	$C_4H_8O_2$	141786	88.106	0.8996	0.25856	523.3	0.278	189.60	11.478	523.3	3.479
148	Ethyl propionate	$C_5H_{10}O_2$	105373	102.133	0.7405	0.25563	546	0.2795	199.25	9.6317	546	2.897
149	Ethyl *n*-butyrate	$C_6H_{12}O_2$	105544	116.160	0.63566	0.25613	571	0.27829	175.15	8.4912	571	2.482
150	*n*-Propyl formate	$C_4H_8O_2$	110747	88.106	0.915	0.26134	538	0.28	180.25	11.59	538	3.501
151	*n*-Propyl acetate	$C_5H_{10}O_2$	109604	102.133	0.73041	0.25456	549.73	0.27666	178.15	9.7941	549.73	2.869
152	*n*-Butyl acetate	$C_6H_{12}O_2$	123864	116.160	0.669	0.26028	579.15	0.309	199.65	8.3747	579.15	2.570
153	Methyl benzoate	$C_8H_8O_2$	93583	136.150	0.53944	0.23519	693	0.2676	260.75	8.2133	693	2.294
154	Ethyl benzoate	$C_9H_{10}O_2$	93890	150.177	0.4883	0.23878	698	0.28487	238.45	7.2924	698	2.045
155	Vinyl acetate	$C_4H_6O_2$	108054	86.090	0.9591	0.2593	519.13	0.27448	180.35	12.287	519.13	3.699
156	Methylamine	CH_5N	74895	31.057	1.39	0.21405	430.05	0.2275	179.69	25.378	430.05	6.494
157	Dimethylamine	C_2H_7N	124403	45.084	1.5436	0.27784	437.2	0.2572	180.96	16.964	437.2	5.556
158	Trimethylamine	C_3H_9N	75503	59.111	1.0116	0.25683	433.25	0.2696	156.08	13.144	433.25	3.939
159	Ethylamine	C_2H_7N	75047	45.084	1.1477	0.23182	456.15	0.26053	192.15	17.588	456.15	4.951
160	Diethylamine	$C_4H_{11}N$	109897	73.138	0.85379	0.25675	496.6	0.27027	223.35	10.575	496.6	3.325

161	Triethylamine	$C_6H_{15}N$	121448	101.192	0.7035	0.27386	535.15	0.2872	158.45	8.2843	535.15	2.569
162	*n*-Propylamine	C_3H_9N	107108	59.111	0.9195	0.23878	496.95	0.2461	188.36	13.764	496.95	3.851
163	di-*n*-Propylamine	$C_6H_{15}N$	142847	101.192	0.659	0.26428	550	0.2766	210.15	7.9929	550	2.494
164	Isopropylamine	C_3H_9N	75310	59.111	1.2801	0.2828	471.85	0.2972	177.95	13.561	471.85	4.527
165	Diisopropylamine	$C_6H_{15}N$	108189	101.192	0.6181	0.25786	523.1	0.271	176.85	8.0541	523.1	2.397
166	Aniline	C_6H_7N	62533	93.128	1.0405	0.2807	699	0.29236	267.13	11.176	699	3.707
167	*N*-Methylaniline	C_7H_9N	100618	107.155	0.6527	0.24324	701.55	0.25374	216.15	9.7244	701.55	2.683
168	*N,N*-Dimethylaniline	$C_8H_{11}N$	121697	121.182	0.4923	0.22868	687.15	0.2335	275.60	7.9705	687.15	2.153
169	Ethylene oxide	C_2H_4O	75218	44.053	1.836	0.26024	469.15	0.2696	160.65	23.477	469.15	7.055
170	Furan	C_4H_4O	110009	68.075	1.1339	0.24741	490.15	0.2612	187.55	15.702	490.15	4.583
171	Thiophene	C_4H_4S	110021	84.142	1.2875	0.28195	579.35	0.3077	234.94	13.431	579.35	4.566
172	Pyridine	C_5H_5N	110861	79.101	0.9815	0.24957	619.95	0.29295	231.51	13.193	619.95	3.933
173	Formamide[5]	CH_3NO	75127	45.041	1.2486	0.20352	771	0.25178	275.60	25.488	771	6.135
174	*N,N*-Dimethyl-formamide	C_3H_7NO	68122	73.095	0.89615	0.23478	649.6	0.28091	212.72	13.954	649.6	3.817
175	Acetamide	C_2H_5NO	60355	59.068	1.016	0.21845	761	0.26116	353.33	16.936	761	4.651
176	*N*-Methylacetamide	C_3H_7NO	79163	73.095	0.88268	0.23568	718	0.27379	301.15	13.012	718	3.745
177	Acetonitrile	C_2H_3N	75058	41.053	1.3064	0.22597	545.5	0.28678	229.32	20.628	545.5	5.781
178	Propionitrile	C_3H_5N	107120	55.079	1.0224	0.23452	564.4	0.2804	180.26	16.027	564.4	4.360
179	*n*-Butyronitrile	C_4H_7N	109740	69.106	0.87533	0.24331	582.25	0.28586	161.25	13.047	582.25	3.598
180	Benzonitrile	C_7H_5N	100470	103.123	0.73136	0.24793	699.35	0.2841	260.40	10.009	699.35	2.950
181	Methyl mercaptan	CH_4S	74931	48.109	1.9323	0.28018	469.95	0.28523	150.18	21.564	469.95	6.897
182	Ethyl mercaptan	C_2H_6S	75081	62.136	1.3047	0.2694	499.15	0.27866	125.26	16.242	499.15	4.843
183	*n*-Propyl mercaptan	C_3H_8S	107039	76.163	1.0714	0.27214	536.6	0.29481	159.95	12.716	536.6	3.937
184	*n*-Butyl mercaptan	$C_4H_{10}S$	109795	90.189	0.89458	0.27463	570.1	0.28512	157.46	10.585	570.1	3.257
185	Isobutyl mercaptan	$C_4H_{10}S$	513440	90.189	0.88801	0.27262	559	0.29522	128.31	10.851	559	3.257
186	*sec*-Butyl mercaptan	$C_4H_{10}S$	513531	90.189	0.89137	0.27365	554	0.2953	133.02	10.761	554	3.257
187	Dimethyl sulfide	C_2H_6S	75183	62.136	1.4029	0.27991	503.04	0.2741	174.88	15.556	503.04	5.012
188	Methyl ethyl sulfide	C_3H_8S	624895	76.163	1.067	0.27101	533	0.29363	167.23	12.672	533	3.937
189	Diethyl sulfide	$C_4H_{10}S$	352932	90.189	0.82413	0.26333	557.15	0.27445	169.20	10.476	557.15	3.130
190	Fluoromethane	CH_3F	593533	34.033	2.1854	0.24725	317.42	0.27558	131.35	29.526	317.42	8.839
191	Chloromethane	CH_3Cl	74873	50.488	1.817	0.25877	416.25	0.2833	175.43	22.347	416.25	7.022
192	Trichloromethane	$CHCl_3$	67663	119.377	1.0841	0.2581	536.4	0.2741	209.63	13.702	536.4	4.200
193	Tetrachloromethane	CCl_4	56235	153.822	0.99835	0.274	556.35	0.287	250.33	10.843	556.35	3.644
194	Bromomethane	CH_3Br	74839	94.939	1.6762	0.26141	467	0.28402	179.47	20.64	467	6.412
195	Fluoroethane	C_2H_5F	353366	48.060	1.6525	0.27099	375.31	0.2442	129.95	19.785	375.31	6.098
196	Chloroethane	C_2H_5Cl	75003	64.514	2.176	0.3377	460.35	0.3361	134.80	16.934	460.35	6.444
197	Bromoethane	C_2H_5Br	74964	108.966	1.1908	0.25595	503.8	0.29152	154.55	15.833	503.8	4.653
198	1-Chloropropane	C_3H_7Cl	540545	78.541	1.087	0.26832	503.15	0.28055	150.35	13.328	503.15	4.051
199	2-Chloropropane	C_3H_7Cl	75296	78.541	1.1202	0.27669	489	0.27646	155.97	12.855	489	4.049
200	1,1-Dichloropropane[1]	$C_3H_6Cl_2$	78999	112.986	0.91064	0.26561	560	0.28571	200.00	11.03	560	3.429
201	1,2-Dichloropropane	$C_3H_6Cl_2$	78875	112.986	0.89833	0.26142	572	0.2868	172.71	11.526	572	3.436
202	Vinyl chloride	C_2H_3Cl	75014	62.499	1.5115	0.2707	432	0.2716	119.36	18.481	432	5.584
203	Fluorobenzene	C_6H_5F	462066	96.104	1.0146	0.27277	560.09	0.28291	230.94	11.374	560.09	3.720
204	Chlorobenzene	C_6H_5Cl	108907	112.558	0.8711	0.26805	632.35	0.2799	227.95	10.385	632.35	3.250
205	Bromobenzene	C_6H_5Br	108861	157.010	0.8226	0.26632	670.15	0.2821	242.43	9.9087	670.15	3.089
206	Air		132259100	28.951	2.8963	0.26733	132.45	0.27341	59.15	33.279	132.45	10.834
207	Hydrogen	H_2	1333740	2.016	5.414	0.34893	33.19	0.2706	13.95	38.487	33.19	15.516
208	Helium-4[4]	He	7440597	4.003	7.2475	0.41865	5.2	0.24096	2.20	37.115	5.2	17.312
209	Neon	Ne	7440019	20.180	7.3718	0.3067	44.4	0.2786	24.56	61.796	44.4	24.036
210	Argon	Ar	7440371	39.948	3.8469	0.2881	150.86	0.29783	83.78	35.491	150.86	13.353
211	Fluorine	F_2	7782414	37.997	4.2895	0.28587	144.12	0.28776	53.48	44.888	144.12	15.005
212	Chlorine	Cl_2	7782505	70.905	2.23	0.27645	417.15	0.2926	172.12	24.242	417.15	8.067
213	Bromine	Br_2	7726956	159.808	2.1872	0.29527	584.15	0.3295	265.85	20.109	584.15	7.408
214	Oxygen	O_2	7782447	31.999	3.9143	0.28772	154.58	0.2924	54.35	40.77	154.58	13.605
215	Nitrogen	N_2	7727379	28.014	3.2091	0.2861	126.2	0.2966	63.15	31.063	126.2	11.217
216	Ammonia	NH_3	7664417	17.031	3.5383	0.25443	405.65	0.2888	195.41	43.141	405.65	13.907
217	Hydrazine	N_2H_4	302012	32.045	1.0516	0.16613	653.15	0.1898	274.69	31.934	653.15	6.330

TABLE 2-30 Densities of Inorganic and Organic Liquids (*Concluded*)

Cmpd. no.	Name	Formula	CAS no.	Mol. wt.	C1	C2	C3	C4	T_{min}, K	Density at T_{min}	T_{max}, K	Density at T_{max}
218	Nitrous oxide	N_2O	10024972	44.013	2.781	0.27244	309.57	0.2882	182.30	27.928	309.57	10.208
219	Nitric oxide	NO	10102439	30.006	5.246	0.3044	180.15	0.242	109.50	44.487	180.15	17.234
220	Cyanogen	C_2N_2	460195	52.036	1.0761	0.20984	400.15	0.20635	245.25	18.513	400.15	5.128
221	Carbon monoxide	CO	630080	28.010	2.897	0.27532	132.92	0.2813	68.15	30.18	132.92	10.522
222	Carbon dioxide	CO_2	124389	44.010	2.768	0.26212	304.21	0.2908	216.58	26.828	304.21	10.560
223	Carbon disulfide	CS_2	75150	76.143	1.7968	0.28749	552	0.3226	161.11	19.064	552	6.250
224	Hydrogen fluoride	HF	7664393	20.006	2.5635	0.1766	461.15	0.3733	189.79	60.203	461.15	14.516
225	Hydrogen chloride	HCl	7647010	36.461	3.342	0.2729	324.65	0.3217	158.97	34.854	324.65	12.246
226	Hydrogen bromide[1]	HBr	10035106	80.912	2.832	0.2832	363.15	0.28571	185.15	27.985	363.15	10.000
227	Hydrogen cyanide	HCN	74908	27.026	1.3413	0.18589	456.65	0.28206	259.83	27.202	456.65	7.216
228	Hydrogen sulfide	H_2S	7783064	34.082	2.7672	0.27369	373.53	0.29015	187.68	29.13	373.53	10.111
229	Sulfur dioxide	SO_2	7446095	64.065	2.106	0.25842	430.75	0.2895	197.67	25.298	430.75	8.150
230	Sulfur trioxide	SO_3	7446119	80.064	1.4969	0.19013	490.85	0.4359	289.95	24.241	490.85	7.873
231	Water[7]	H_2O	7732185	18.015	5.459	0.30542	647.13	0.081	273.16	55.583	333.15	54.703

All substances are listed in alphabetical order in Table 2-6*a*. Compiled from Daubert, T. E., R. P. Danner, H. M. Sibul, and C. C. Stebbins, DIPPR Data Compilation of Pure Compound Properties, Project 801 Sponsor Release, July, 1993, Design Institute for Physical Property Data, AIChE, New York, NY; and from Thermodynamics Research Center, "Selected Values of Properties of Hydrocarbons and Related Compounds," Thermodynamics Research Center Hydrocarbon Project, Texas A&M University, College Station, Texas (extant 1994).

Temperatures are in kelvins. Liquid densities are in kmol/m^3. Density formulas: kmol/m^3 × (mol. wt./1E+03) = g/cm^3; kmol/m^3 × (mol. wt./1.601846E+01) = lb/ft^3.

The liquid density equation is $C1/C2^{[1+(1-T/C_3)^{C_4}]}$ unless otherwise noted.

[1] The modified Rackett equation, density = $(P_c/RT_c)/ZRA^{1+[1-(T/T_c)]2/7}$, was used. See Spencer, C. F., and R. P. Danner, "Improved Equation for Prediction of Saturated Liquid Density," *J. Chem. Eng. Data* **17,** 236 (1972).

[2] Decomposes violently on heating. Forms explosive peroxides with air or oxygen. Polymerizes under pressure and heat.

[3] For the hypothetical pure liquid.

[4] Exhibits superfluid properties below 2.2 K.

[5] Coefficients are hypothetical above the decomposition temperature.

[6] Lower limit is for the undercooled liquid.

[7] For the temperature range 333.15 to 403.15 K, use the coefficients: C_1 = 4.9669E+00, C_2 = 2.7788E−01, C_3 = 6.4713E+02, C_4 = 1.8740E−01. For the temperature range 403.15 to 647.13 K, use C_1 = 4.3910E+00, C_2 = 2.4870E−01, C_3 = 6.4713E+02, C_4 = 2.5340E−01.