TABLE 2-106 Critical Constants and Acentric Factors of Inorganic and Organic Compounds

Cmpd. no.	Name	Formula	CAS	Mol. wt.	T_C, K	P_C, MPa	V_C, m^3/kmol	Z_C	Acentric factor
1	Acetaldehyde	C_2H_4O	75-07-0	44.05256	466	5.57	0.154	0.221	0.262493
2	Acetamide	C_2H_5NO	60-35-5	59.0672	761	6.6	0.215	0.224	0.421044
3	Acetic acid	$C_2H_4O_2$	64-19-7	60.052	591.95	5.786	0.177	0.208	0.466521
4	Acetic anhydride	$C_4H_6O_3$	108-24-7	102.08864	606	4	0.304	0.241	0.455328
5	Acetone	C_3H_6O	67-64-1	58.07914	508.2	4.701	0.209	0.233	0.306527
6	Acetonitrile	C_2H_3N	75-05-8	41.0519	545.5	4.85	0.193	0.206	0.341926
7	Acetylene	C_2H_2	74-86-2	26.03728	308.3	6.138	0.112	0.268	0.191185
8	Acrolein	C_3H_4O	107-02-8	56.06326	506	5	0.197	0.234	0.319832
9	Acrylic acid	$C_3H_4O_2$	79-10-7	72.06266	615	5.66	0.208	0.23	0.538324
10	Acrylonitrile	C_3H_3N	107-13-1	53.0626	540	4.66	0.216	0.224	0.310664
11	Air	Mixture	132259-10-0	28.96	132.45	3.774	0.09147	0.313	0
12	Ammonia	H_3N	7664-41-7	17.03052	405.65	11.28	0.07247	0.242	0.252608
13	Anisole	C_7H_8O	100-66-3	108.13782	645.6	4.25	0.337	0.267	0.350169
14	Argon	Ar	7440-37-1	39.948	150.86	4.898	0.07459	0.291	0
15	Benzamide	C_7H_7NO	55-21-0	121.13658	824	5.05	0.346	0.255	0.5585
16	Benzene	C_6H_6	71-43-2	78.11184	562.05	4.895	0.256	0.268	0.2103
17	Benzenethiol	C_6H_6S	108-98-5	110.17684	689	4.74	0.315	0.261	0.262789
18	Benzoic acid	$C_7H_6O_2$	65-85-0	122.12134	751	4.47	0.344	0.246	0.602794
19	Benzonitrile	C_7H_5N	100-47-0	103.1213	702.3	4.215	0.3132	0.226	0.343214
20	Benzophenone	$C_{13}H_{10}O$	119-61-9	182.2179	830	3.352	0.5677	0.276	0.501941
21	Benzyl alcohol	C_7H_8O	100-51-6	108.13782	720.15	4.374	0.382	0.279	0.363116
22	Benzyl ethyl ether	$C_9H_{12}O$	539-30-0	136.19098	662	3.11	0.442	0.25	0.433236
23	Benzyl mercaptan	C_7H_8S	100-53-8	124.20342	718	4.06	0.367	0.25	0.312604
24	Biphenyl	$C_{12}H_{10}$	92-52-4	154.2078	773	3.38	0.497	0.261	0.402873
25	Bromine	Br_2	7726-95-6	159.808	584.15	10.3	0.135	0.286	0.128997
26	Bromobenzene	C_6H_5Br	108-86-1	157.0079	670.15	4.5191	0.324	0.263	0.250575
27	Bromoethane	C_2H_5Br	74-96-4	108.965	503.8	5.565	0.204	0.271	0.205275
28	Bromomethane	CH_3Br	74-83-9	94.93852	464	6.929	0.152	0.273	0.153426
29	1,2-Butadiene	C_4H_6	590-19-2	54.09044	452	4.36	0.22	0.255	0.165877
30	1,3-Butadiene	C_4H_6	106-99-0	54.09044	425	4.32	0.221	0.27	0.195032
31	Butane	C_4H_{10}	106-97-8	58.1222	425.12	3.796	0.255	0.274	0.200164
32	1,2-Butanediol	$C_4H_{10}O_2$	584-03-2	90.121	680	5.21	0.303	0.279	0.630463
33	1,3-Butanediol	$C_4H_{10}O_2$	107-88-0	90.121	676	4.02	0.305	0.218	0.704256
34	1-Butanol	$C_4H_{10}O$	71-36-3	74.1216	563.1	4.414	0.273	0.258	0.58828
35	2-Butanol	$C_4H_{10}O$	78-92-2	74.1216	535.9	4.1885	0.27	0.254	0.580832
36	1-Butene	C_4H_8	106-98-9	56.10632	419.5	4.02	0.241	0.278	0.184495
37	*cis*-2-Butene	C_4H_8	590-18-1	56.10632	435.5	4.21	0.234	0.272	0.201877
38	*trans*-2-Butene	C_4H_8	624-64-6	56.10632	428.6	4.1	0.238	0.274	0.217592
39	Butyl acetate	$C_6H_{12}O_2$	123-86-4	116.15828	575.4	3.09	0.389	0.251	0.439393
40	Butylbenzene	$C_{10}H_{14}$	104-51-8	134.21816	660.5	2.89	0.497	0.262	0.394149
41	Butyl mercaptan	$C_4H_{10}S$	109-79-5	90.1872	570.1	3.97	0.307	0.257	0.271361
42	sec-Butyl mercaptan	$C_4H_{10}S$	513-53-1	90.1872	554	4.06	0.307	0.271	0.25059
43	1-Butyne	C_4H_6	107-00-6	54.09044	440	4.6	0.208	0.262	0.246976
44	Butyraldehyde	C_4H_8O	123-72-8	72.10572	537.2	4.41	0.258	0.255	0.282553
45	Butyric acid	$C_4H_8O_2$	107-92-6	88.1051	615.7	4.06	0.293	0.232	0.675003
46	Butyronitrile	C_4H_7N	109-74-0	69.1051	585.4	3.88	0.291	0.232	0.3601
47	Carbon dioxide	CO_2	124-38-9	44.0095	304.21	7.383	0.094	0.274	0.223621
48	Carbon disulfide	CS_2	75-15-0	76.1407	552	7.9	0.16	0.275	0.110697
49	Carbon monoxide	CO	630-08-0	28.0101	132.92	3.499	0.0944	0.299	0.0481621
50	Carbon tetrachloride	CCl_4	56-23-5	153.8227	556.35	4.56	0.276	0.272	0.192552
51	Carbon tetrafluoride	CF_4	75-73-0	88.0043	227.51	3.745	0.143	0.283	0.178981
52	Chlorine	Cl_2	7782-50-5	70.906	417.15	7.71	0.124	0.276	0.0688183

(*Continued*)

TABLE 2-106 Critical Constants and Acentric Factors of Inorganic and Organic Compounds (*Continued*)

Cmpd. no.	Name	Formula	CAS	Mol. wt.	T_C, K	P_C, MPa	V_C, m^3/kmol	Z_C	Acentric factor
53	Chlorobenzene	C_6H_5Cl	108-90-7	112.5569	632.35	4.5191	0.308	0.265	0.249857
54	Chloroethane	C_2H_5Cl	75-00-3	64.5141	460.35	5.27	0.192	0.264	0.188591
55	Chloroform	$CHCl_3$	67-66-3	119.37764	536.4	5.472	0.239	0.293	0.221902
56	Chloromethane	CH_3Cl	74-87-3	50.4875	416.25	6.68	0.141	0.272	0.151
57	1-Chloropropane	C_3H_7Cl	540-54-5	78.54068	503.15	4.425	0.243	0.257	0.215047
58	2-Chloropropane	C_3H_7Cl	75-29-6	78.54068	489	4.54	0.247	0.276	0.198553
59	*m*-Cresol	C_7H_8O	108-39-4	108.13782	705.85	4.56	0.312	0.242	0.448034
60	*o*-Cresol	C_7H_8O	95-48-7	108.13782	697.55	5.01	0.282	0.244	0.43385
61	*p*-Cresol	C_7H_8O	106-44-5	108.13782	704.65	5.15	0.277	0.244	0.50721
62	Cumene	C_9H_{12}	98-82-8	120.19158	631	3.209	0.434	0.265	0.327406
63	Cyanogen	C_2N_2	460-19-5	52.0348	400.15	5.924	0.151	0.269	0.275605
64	Cyclobutane	C_4H_8	287-23-0	56.10632	459.93	4.98	0.21	0.273	0.18474
65	Cyclohexane	C_6H_{12}	110-82-7	84.15948	553.8	4.08	0.308	0.273	0.208054
66	Cyclohexanol	$C_6H_{12}O$	108-93-0	100.15888	650.1	4.26	0.322	0.254	0.369047
67	Cyclohexanone	$C_6H_{10}O$	108-94-1	98.143	653	4	0.311	0.229	0.299006
68	Cyclohexene	C_6H_{10}	110-83-8	82.1436	560.4	4.35	0.291	0.272	0.212302
69	Cyclopentane	C_5H_{10}	287-92-3	70.1329	511.7	4.51	0.26	0.276	0.194874
70	Cyclopentene	C_5H_8	142-29-0	68.11702	507	4.8	0.245	0.279	0.19611
71	Cyclopropane	C_3H_6	75-19-4	42.07974	398	5.54	0.162	0.271	0.127829
72	Cyclohexyl mercaptan	$C_6H_{12}S$	1569-69-3	116.22448	664	3.97	0.355	0.255	0.264134
73	Decanal	$C_{10}H_{20}O$	112-31-2	156.2652	674	2.6	0.575	0.267	0.520066
74	Decane	$C_{10}H_{22}$	124-18-5	142.28168	617.7	2.11	0.617	0.254	0.492328
75	Decanoic acid	$C_{10}H_{20}O_2$	334-48-5	172.265	722.1	2.28	0.639	0.243	0.813724
76	1-Decanol	$C_{10}H_{22}O$	112-30-1	158.28108	688	2.308	0.645	0.26	0.606986
77	1-Decene	$C_{10}H_{20}$	872-05-9	140.2658	616.6	2.223	0.584	0.253	0.480456
78	Decyl mercaptan	$C_{10}H_{22}S$	143-10-2	174.34668	696	2.13	0.624	0.23	0.587421
79	1-Decyne	$C_{10}H_{18}$	764-93-2	138.24992	619.85	2.37	0.552	0.254	0.51783
80	Deuterium	D_2	7782-39-0	4.0316	38.35	1.6617	0.060263	0.314	−0.14486
81	1,1-Dibromoethane	$C_2H_4Br_2$	557-91-5	187.86116	628	6.03	0.276	0.319	0.125025
82	1,2-Dibromoethane	$C_2H_4Br_2$	106-93-4	187.86116	650.15	5.4769	0.2616	0.265	0.206724
83	Dibromomethane	CH_2Br_2	74-95-3	173.83458	611	7.17	0.223	0.315	0.20945
84	Dibutyl ether	$C_8H_{18}O$	142-96-1	130.22792	584.1	2.46	0.487	0.247	0.447646
85	*m*-Dichlorobenzene	$C_6H_4Cl_2$	541-73-1	147.00196	683.95	4.07	0.351	0.251	0.27898
86	*o*-Dichlorobenzene	$C_6H_4Cl_2$	95-50-1	147.00196	705	4.07	0.351	0.244	0.219189
87	*p*-Dichlorobenzene	$C_6H_4Cl_2$	106-46-7	147.00196	684.75	4.07	0.351	0.251	0.284638
88	1,1-Dichloroethane	$C_2H_4Cl_2$	75-34-3	98.95916	523	5.07	0.24	0.28	0.233943
89	1,2-Dichloroethane	$C_2H_4Cl_2$	107-06-2	98.95916	561.6	5.37	0.22	0.253	0.286595
90	Dichloromethane	CH_2Cl_2	75-09-2	84.93258	510	6.08	0.185	0.265	0.198622
91	1,1-Dichloropropane	$C_3H_6Cl_2$	78-99-9	112.98574	560	4.24	0.291	0.265	0.252928
92	1,2-Dichloropropane	$C_3H_6Cl_2$	78-87-5	112.98574	572	4.24	0.291	0.259	0.256391
93	Diethanol amine	$C_4H_{11}NO_2$	111-42-2	105.13564	736.6	4.27	0.349	0.243	0.952882
94	Diethyl amine	$C_4H_{11}N$	109-89-7	73.13684	496.6	3.71	0.301	0.27	0.303856
95	Diethyl ether	$C_4H_{10}O$	60-29-7	74.1216	466.7	3.64	0.28	0.263	0.281065
96	Diethyl sulfide	$C_4H_{10}S$	352-93-2	90.1872	557.15	3.96	0.318	0.272	0.29002
97	1,1-Difluoroethane	$C_2H_4F_2$	75-37-6	66.04997	386.44	4.5198	0.179	0.252	0.275052
98	1,2-Difluoroethane	$C_2H_4F_2$	624-72-6	66.04997	445	4.34	0.195	0.229	0.222428
99	Difluoromethane	CH_2F_2	75-10-5	52.02339	351.255	5.784	0.123	0.244	0.277138
100	Di–isopropyl amine	$C_6H_{15}N$	108-18-9	101.19	523.1	3.2	0.418	0.308	0.388315
101	Di–isopropyl ether	$C_6H_{14}O$	108-20-3	102.17476	500.05	2.88	0.386	0.267	0.338683
102	Di–isopropyl ketone	$C_7H_{14}O$	565-80-0	114.18546	576	3.02	0.416	0.262	0.404427
103	1,1-Dimethoxyethane	$C_4H_{10}O_2$	534-15-6	90.121	507.8	3.773	0.297	0.265	0.32768
104	1,2-Dimethoxypropane	$C_5H_{12}O_2$	7778-85-0	104.14758	543	3.446	0.35	0.267	0.352222
105	Dimethyl acetylene	C_4H_6	503-17-3	54.09044	473.2	4.87	0.221	0.274	0.238542

106	Dimethyl amine	C_2H_7N	124-40-3	45.08368	437.2	5.34	0.18	0.264	0.299885
107	2,3-Dimethylbutane	C_6H_{14}	79-29-8	86.17536	500	3.15	0.361	0.274	0.249251
108	1,1-Dimethylcyclohexane	C_8H_{16}	590-66-9	112.21264	591.15	2.93843	0.45	0.269	0.232569
109	*cis*-1,2-Dimethylcyclohexane	C_8H_{16}	2207-01-4	112.21264	606.15	2.93843	0.46	0.268	0.232443
110	*trans*-1,2-Dimethylcyclohexane	C_8H_{16}	6876-23-9	112.21264	596.15	2.93843	0.46	0.273	0.237864
111	Dimethyl disulfide	$C_2H_6S_2$	624-92-0	94.19904	615	5.36	0.252	0.264	0.205916
112	Dimethyl ether	C_2H_6O	115-10-6	46.06844	400.1	5.37	0.17	0.2744	0.200221
113	*N,N*-Dimethyl formamide	C_3H_7NO	68-12-2	73.09378	649.6	4.42	0.26199	0.214	0.31771
114	2,3-Dimethylpentane	C_7H_{16}	565-59-3	100.20194	537.3	2.91	0.393	0.256	0.296407
115	Dimethyl phthalate	$C_{10}H_{10}O_4$	131-11-3	194.184	766	2.78	0.53	0.231	0.656848
116	Dimethylsilane	C_2H_8Si	1111-74-6	60.17042	402	3.56	0.258	0.275	0.129957
117	Dimethyl sulfide	C_2H_6S	75-18-3	62.134	503.04	5.53	0.201	0.266	0.194256
118	Dimethyl sulfoxide	C_2H_6OS	67-68-5	78.13344	729	5.65	0.227	0.212	0.280551
119	Dimethyl terephthalate	$C_{10}H_{10}O_4$	120-61-6	194.184	777.4	2.76	0.529	0.226	0.580691
120	1,4-Dioxane	$C_4H_8O_2$	123-91-1	88.10512	587	5.2081	0.238	0.254	0.279262
121	Diphenyl ether	$C_{12}H_{10}O$	101-84-8	170.2072	766.8	3.08	0.503	0.243	0.43889
122	Dipropyl amine	$C_6H_{15}N$	142-84-7	101.19	550	3.14	0.402	0.276	0.449684
123	Dodecane	$C_{12}H_{26}$	112-40-3	170.33484	658	1.82	0.755	0.251	0.576385
124	Eicosane	$C_{20}H_{42}$	112-95-8	282.54748	768	1.16	1.34	0.243	0.906878
125	Ethane	C_2H_6	74-84-0	30.069	305.32	4.872	0.1455	0.279	0.099493
126	Ethanol	C_2H_6O	64-17-5	46.06844	514	6.137	0.168	0.241	0.643558
127	Ethyl acetate	$C_4H_8O_2$	141-78-6	88.10512	523.3	3.88	0.286	0.255	0.366409
128	Ethyl amine	C_2H_7N	75-04-7	45.08368	456.15	5.62	0.207	0.307	0.284788
129	Ethylbenzene	C_8H_{10}	100-41-4	106.165	617.15	3.609	0.374	0.263	0.30347
130	Ethyl benzoate	$C_9H_{10}O_2$	93-89-0	150.1745	698	3.18	0.489	0.268	0.477055
131	2-Ethyl butanoic acid	$C_6H_{12}O_2$	88-09-5	116.15828	655	3.41	0.389	0.244	0.632579
132	Ethyl butyrate	$C_6H_{12}O_2$	105-54-4	116.15828	571	2.95	0.403	0.25	0.401075
133	Ethylcyclohexane	C_8H_{16}	1678-91-7	112.21264	609.15	3.04	0.43	0.258	0.245525
134	Ethylcyclopentane	C_7H_{14}	1640-89-7	98.18606	569.5	3.4	0.375	0.269	0.270095
135	Ethylene	C_2H_4	74-85-1	28.05316	282.34	5.041	0.131	0.281	0.0862484
136	Ethylenediamine	$C_2H_8N_2$	107-15-3	60.09832	593	6.29	0.264	0.337	0.472367
137	Ethylene glycol	$C_2H_6O_2$	107-21-1	62.06784	720	8.2	0.191	0.262	0.506776
138	Ethyleneimine	C_2H_5N	151-56-4	43.0678	537	6.85	0.173	0.265	0.200735
139	Ethylene oxide	C_2H_4O	75-21-8	44.05256	469.15	7.19	0.140296	0.25876	0.197447
140	Ethyl formate	$C_3H_6O_2$	109-94-4	74.07854	508.4	4.74	0.229	0.257	0.284736
141	2-Ethyl hexanoic acid	$C_8H_{16}O_2$	149-57-5	144.211	674.6	2.778	0.528	0.262	0.801289
142	Ethylhexyl ether	$C_8H_{18}O$	5756-43-4	130.22792	583	2.46	0.487	0.247	0.494378
143	Ethylisopropyl ether	$C_5H_{12}O$	625-54-7	88.14818	489	3.41	0.329	0.276	0.305629
144	Ethylisopropyl ketone	$C_6H_{12}O$	565-69-5	100.15888	567	3.32	0.369	0.26	0.389061
145	Ethyl mercaptan	C_2H_6S	75-08-1	62.13404	499.15	5.49	0.207	0.274	0.187751
146	Ethyl propionate	$C_5H_{10}O_2$	105-37-3	102.1317	546	3.362	0.345	0.256	0.394373
147	Ethylpropyl ether	$C_5H_{12}O$	628-32-0	88.14818	500.23	3.37007	0.339	0.275	0.347328
148	Ethyltrichlorosilane	$C_2H_5Cl_3Si$	115-21-9	163.506	559.95	3.33	0.403	0.288	0.269778
149	Fluorine	F_2	7782-41-4	37.9968064	144.12	5.1724	0.066547	0.287	0.0530336
150	Fluorobenzene	C_6H_5F	462-06-6	96.1023032	560.09	4.55051	0.269	0.263	0.247183
151	Fluoroethane	C_2H_5F	353-36-6	48.0595	375.31	5.028	0.159	0.256	0.217903
152	Fluoromethane	CH_3F	593-53-3	34.03292	317.42	5.87511	0.113	0.252	0.194721
153	Formaldehyde	CH_2O	50-00-0	30.02598	420	6.59	0.0851	0.161	0.167887
154	Formamide	CH_3NO	75-12-7	45.04062	771	7.8	0.163	0.198	0.412381
155	Formic acid	CH_2O_2	64-18-6	46.0257	588	5.81	0.125	0.149	0.312521
156	Furan	C_4H_4O	110-00-9	68.07396	490.15	5.5	0.218	0.294	0.201538
157	Helium-4	He	7440-59-7	4.0026	5.2	0.2275	0.0573	0.302	−0.390032
158	Heptadecane	$C_{17}H_{36}$	629-78-7	240.46774	736	1.34	1.11	0.244	0.769688
159	Heptanal	$C_7H_{14}O$	111-71-7	114.18546	620	3.16	0.434	0.266	0.405751
160	Heptane	C_7H_{16}	142-82-5	100.20194	540.2	2.74	0.428	0.261	0.349469

(*Continued*)

TABLE 2-106 Critical Constants and Acentric Factors of Inorganic and Organic Compounds (*Continued*)

Cmpd. no.	Name	Formula	CAS	Mol. wt.	T_C, K	P_C, MPa	V_C, m^3/kmol	Z_C	Acentric factor
161	Heptanoic acid	$C_7H_{14}O_2$	111-14-8	130.185	677.3	3.043	0.466	0.252	0.759934
162	1-Heptanol	$C_7H_{16}O$	111-70-6	116.20134	632.3	3.085	0.444	0.261	0.562105
163	2-Heptanol	$C_7H_{16}O$	543-49-7	116.20134	608.3	3	0.447	0.265	0.567733
164	3-Heptanone	$C_7H_{14}O$	106-35-4	114.18546	606.6	2.92	0.433	0.251	0.407565
165	2-Heptanone	$C_7H_{14}O$	110-43-0	114.18546	611.4	2.94	0.434	0.251	0.418982
166	1-Heptene	C_7H_{14}	592-76-7	98.18606	537.4	2.92	0.402	0.263	0.343194
167	Heptyl mercaptan	$C_7H_{16}S$	1639-09-4	132.26694	645	2.77	0.465	0.24	0.422568
168	1-Heptyne	C_7H_{12}	628-71-7	96.17018	547	3.21	0.387	0.273	0.377799
169	Hexadecane	$C_{16}H_{34}$	544-76-3	226.44116	723	1.4	1.04	0.243	0.717404
170	Hexanal	$C_6H_{12}O$	66-25-1	100.15888	594	3.46	0.378	0.266	0.361818
171	Hexane	C_6H_{14}	110-54-3	86.17536	507.6	3.025	0.371	0.266	0.301261
172	Hexanoic acid	$C_6H_{12}O_2$	142-62-1	116.158	660.2	3.308	0.408	0.246	0.733019
173	1-Hexanol	$C_6H_{14}O$	111-27-3	102.17476	611.3	3.446	0.382	0.259	0.558598
174	2-Hexanol	$C_6H_{14}O$	626-93-7	102.175	585.3	3.311	0.385	0.262	0.553
175	2-Hexanone	$C_6H_{12}O$	591-78-6	100.15888	587.61	3.287	0.378	0.254	0.384626
176	3-Hexanone	$C_6H_{12}O$	589-38-8	100.15888	582.82	3.32	0.378	0.259	0.380086
177	1-Hexene	C_6H_{12}	592-41-6	84.15948	504	3.21	0.348	0.267	0.285121
178	3-Hexyne	C_6H_{10}	928-49-4	82.1436	544	3.53	0.331	0.258	0.218301
179	Hexyl mercaptan	$C_6H_{14}S$	111-31-9	118.24036	623	3.08	0.412	0.245	0.368101
180	1-Hexyne	C_6H_{10}	693-02-7	82.1436	516.2	3.62	0.322	0.272	0.332699
181	2-Hexyne	C_6H_{10}	764-35-2	82.1436	549	3.53	0.331	0.256	0.221387
182	Hydrazine	H_4N_2	302-01-2	32.04516	653.15	14.7	0.158	0.428	0.314282
183	Hydrogen	H_2	1333-74-0	2.01588	33.19	1.313	0.064147	0.305	–0.215993
184	Hydrogen bromide	BrH	10035-10-6	80.91194	363.15	8.552	0.1	0.283	0.073409
185	Hydrogen chloride	ClH	7647-01-0	36.46094	324.65	8.31	0.081	0.249	0.131544
186	Hydrogen cyanide	CHN	74-90-8	27.02534	456.65	5.39	0.139	0.197	0.409913
187	Hydrogen fluoride	FH	7664-39-3	20.0063432	461.15	6.48	0.069	0.117	0.382283
188	Hydrogen sulfide	H_2S	7783-06-4	34.08088	373.53	8.96291	0.0985	0.284	0.0941677
189	Isobutyric acid	$C_4H_8O_2$	79-31-2	88.10512	605	3.7	0.292	0.215	0.61405
190	Isopropyl amine	C_3H_9N	75-31-0	59.11026	471.85	4.54	0.221	0.256	0.275913
191	Malonic acid	$C_3H_4O_4$	141-82-2	104.06146	834	6.1	0.279	0.245	0.738273
192	Methacrylic acid	$C_4H_6O_2$	79-41-4	86.08924	662	4.79	0.28	0.244	0.331817
193	Methane	CH_4	74-82-8	16.0425	190.564	4.599	0.0986	0.286	0.0115478
194	Methanol	CH_4O	67-56-1	32.04186	512.5	8.084	0.117	0.222	0.565831
195	*N*-Methyl acetamide	C_3H_7NO	79-16-3	73.09378	718	4.98	0.267	0.223	0.435111
196	Methyl acetate	$C_3H_6O_2$	79-20-9	74.07854	506.55	4.75	0.228	0.257	0.331255
197	Methyl acetylene	C_3H_4	74-99-7	40.06386	402.4	5.63	0.164	0.276	0.211537
198	Methyl acrylate	$C_4H_6O_2$	96-33-3	86.08924	536	4.25	0.27	0.258	0.342296
199	Methyl amine	CH_5N	74-89-5	31.0571	430.05	7.46	0.154	0.321	0.281417
200	Methyl benzoate	$C_8H_8O_2$	93-58-3	136.14792	693	3.59	0.436	0.272	0.420541
201	3-Methyl-1,2-butadiene	C_5H_8	598-25-4	68.11702	490	3.83	0.291	0.274	0.187439
202	2-Methylbutane	C_5H_{12}	78-78-4	72.14878	460.4	3.38	0.306	0.27	0.227875
203	2-Methylbutanoic acid	$C_5H_{10}O_2$	116-53-0	102.1317	643	3.89	0.347	0.252	0.589443
204	3-Methyl-1-butanol	$C_5H_{12}O$	123-51-3	88.1482	577.2	3.93	0.329	0.269	0.59002
205	2-Methyl-1-butene	C_5H_{10}	563-46-2	70.1329	465	3.447	0.292	0.26	0.234056
206	2-Methyl-2-butene	C_5H_{10}	513-35-9	70.1329	470	3.42	0.292	0.256	0.28703
207	2-Methyl -1-butene-3-yne	C_5H_6	78-80-8	66.10114	492	4.38	0.248	0.266	0.137046
208	Methylbutyl ether	$C_5H_{12}O$	628-28-4	88.14818	512.74	3.371	0.329	0.26	0.313008
209	Methylbutyl sulfide	$C_5H_{12}S$	628-29-5	104.214	593	3.47	0.36	0.253	0.3229
210	3-Methyl-1-butyne	C_5H_8	598-23-2	68.11702	463.2	4.2	0.275	0.3	0.308085
211	Methyl butyrate	$C_5H_{10}O_2$	623-42-7	102.1317	554.5	3.473	0.34	0.256	0.377519
212	Methylchlorosilane	CH_5ClSi	993-00-0	80.5889	442	4.17	0.246	0.279	0.225204
213	Methylcyclohexane	C_7H_{14}	108-87-2	98.18606	572.1	3.48	0.369	0.27	0.236055

214	1-Methylcyclohexanol	$C_7H_{14}O$	590-67-0	114.18546	686	4	0.374	0.262	0.221299
215	*cis*-2-Methylcyclohexanol	$C_7H_{14}O$	7443-70-1	114.18546	614	3.79	0.374	0.278	0.68049
216	*trans*-2-Methylcyclohexanol	$C_7H_{14}O$	7443-52-9	114.18546	617	3.79	0.374	0.276	0.67904
217	Methylcyclopentane	C_6H_{12}	96-37-7	84.15948	532.7	3.79	0.319	0.273	0.228759
218	1-Methylcyclopentene	C_6H_{10}	693-89-0	82.1436	542	4.13	0.303	0.278	0.23179
219	3-Methylcyclopentene	C_6H_{10}	1120-62-3	82.1436	526	4.13	0.303	0.286	0.229606
220	Methyldichlorosilane	CH_4Cl_2Si	75-54-7	115.03396	483	3.95	0.289	0.284	0.275755
221	Methylethyl ether	C_3H_8O	540-67-0	60.09502	437.8	4.4	0.221	0.267	0.231374
222	Methylethyl ketone	C_4H_8O	78-93-3	72.10572	535.5	4.15	0.267	0.249	0.323369
223	Methylethyl sulfide	C_3H_8S	624-89-5	76.1606	533	4.26	0.254	0.244	0.209108
224	Methyl formate	$C_2H_4O_2$	107-31-3	60.05196	487.2	6	0.172	0.255	0.255551
225	Methylisobutyl ether	$C_5H_{12}O$	625-44-5	88.14818	497	3.41	0.329	0.272	0.307786
226	Methylisobutyl ketone	$C_6H_{12}O$	108-10-1	100.15888	574.6	3.27	0.369	0.253	0.355671
227	Methyl Isocyanate	C_2H_3NO	624-83-9	57.05132	488	5.48	0.202	0.273	0.300694
228	Methylisopropyl ether	$C_4H_{10}O$	598-53-8	74.1216	464.48	3.762	0.276	0.269	0.26555
229	Methylisopropyl ketone	$C_5H_{10}O$	563-80-4	86.1323	553.4	3.8	0.31	0.256	0.320845
230	Methylisopropyl sulfide	$C_4H_{10}S$	1551-21-9	90.1872	553.1	4.021	0.328	0.28718	0.24611
231	Methyl mercaptan	CH_4S	74-93-1	48.10746	469.95	7.23	0.145	0.268	0.158174
232	Methyl methacrylate	$C_5H_8O_2$	80-62-6	100.11582	566	3.68	0.323	0.253	0.280233
233	2-Methyloctanoic acid	$C_9H_{18}O_2$	3004-93-1	158.23802	694	2.54	0.572	0.252	0.791271
234	2-Methylpentane	C_6H_{14}	107-83-5	86.17536	497.7	3.04	0.368	0.27	0.279149
235	Methyl pentyl ether	$C_6H_{14}O$	628-80-8	102.17476	546.49	3.042	0.38	0.254	0.344201
236	2-Methylpropane	C_4H_{10}	75-28-5	58.1222	407.8	3.64	0.259	0.278	0.183521
237	2-Methyl-2-propanol	$C_4H_{10}O$	75-65-0	74.1216	506.2	3.972	0.275	0.26	0.615203
238	2-Methyl propene	C_4H_8	115-11-7	56.10632	417.9	4	0.239	0.275	0.19484
239	Methyl propionate	$C_4H_8O_2$	554-12-1	88.10512	530.6	4.004	0.282	0.256	0.346586
240	Methylpropyl ether	$C_4H_{10}O$	557-17-5	74.1216	476.25	3.801	0.276	0.265	0.276999
241	Methylpropyl sulfide	$C_4H_{10}S$	3877-15-4	90.1872	565	3.97	0.307	0.259	0.273669
242	Methylsilane	CH_6Si	992-94-9	46.14384	352.5	4.7	0.205	0.329	0.131449
243	alpha-Methyl styrene	C_9H_{10}	98-83-9	118.1757	654	3.36	0.399	0.247	0.32297
244	Methyl tert-butyl ether	$C_5H_{12}O$	1634-04-4	88.1482	497.1	3.286	0.329	0.262	0.246542
245	Methyl vinyl ether	C_3H_6O	107-25-5	58.07914	437	4.67	0.21	0.27	0.241564
246	Naphthalene	$C_{10}H_8$	91-20-3	128.17052	748.4	4.05	0.407	0.265	0.302034
247	Neon	Ne	7440-01-9	20.1797	44.4	2.653	0.0417	0.3	−0.0395988
248	Nitroethane	$C_2H_5NO_2$	79-24-3	75.0666	593	5.16	0.236	0.247	0.380324
249	Nitrogen	N_2	7727-37-9	28.0134	126.2	3.4	0.08921	0.289	0.0377215
250	Nitrogen trifluoride	F_3N	7783-54-2	71.00191	234	4.4607	0.11875	0.272	0.119984
251	Nitromethane	CH_3NO_2	75-52-5	61.04002	588.15	6.31	0.173	0.223	0.348026
252	Nitrous oxide	N_2O	10024-97-2	44.0128	309.57	7.245	0.0974	0.274	0.140894
253	Nitric oxide	NO	10102-43-9	30.0061	180.15	6.48	0.058	0.251	0.582944
254	Nonadecane	$C_{19}H_{40}$	629-92-5	268.5209	758	1.21	1.26	0.242	0.852231
255	Nonanal	$C_9H_{18}O$	124-19-6	142.23862	658.5	2.68	0.543	0.266	0.473309
256	Nonane	C_9H_{20}	111-84-2	128.2551	594.6	2.29	0.551	0.255	0.44346
257	Nonanoic acid	$C_9H_{18}O_2$	112-05-0	158.238	710.7	2.514	0.584	0.248	0.778706
258	1-Nonanol	$C_9H_{20}O$	143-08-8	144.2545	670.9	2.527	0.576	0.261	0.584074
259	2-Nonanol	$C_9H_{20}O$	628-99-9	144.255	649.5	2.5408	0.577	0.271	0.6092
260	1-Nonene	C_9H_{18}	124-11-8	126.23922	593.1	2.428	0.524	0.258	0.436736
261	Nonyl mercaptan	$C_9H_{20}S$	1455-21-6	160.3201	681	2.31	0.571	0.233	0.52604
262	1-Nonyne	C_9H_{16}	3452-09-3	124.22334	598.05	2.61	0.497	0.261	0.470974
263	Octadecane	$C_{18}H_{38}$	593-45-3	254.49432	747	1.27	1.19	0.243	0.811359
264	Octanal	$C_8H_{16}O$	124-13-0	128.212	638.9	2.96	0.488	0.272	0.441993
265	Octane	C_8H_{18}	111-65-9	114.22852	568.7	2.49	0.486	0.256	0.399552
266	Octanoic acid	$C_8H_{16}O_2$	124-07-2	144.211	694.26	2.779	0.523	0.252	0.773427
267	1-Octanol	$C_8H_{18}O$	111-87-5	130.22792	652.3	2.783	0.509	0.261	0.569694
268	2-Octanol	$C_8H_{18}O$	123-96-6	130.228	629.8	2.749	0.512	0.269	0.58814

(*Continued*)

TABLE 2-106 Critical Constants and Acentric Factors of Inorganic and Organic Compounds (*Continued*)

Cmpd. no.	Name	Formula	CAS	Mol. wt.	T_C, K	P_C, MPa	V_C, m^3/kmol	Z_C	Acentric factor
269	2-Octanone	$C_8H_{16}O$	111-13-7	128.21204	632.7	2.64	0.497	0.249	0.454874
270	3-Octanone	$C_8H_{16}O$	106-68-3	128.21204	627.7	2.704	0.496953	0.257	0.440561
271	1-Octene	C_8H_{16}	111-66-0	112.21264	566.9	2.663	0.464	0.262	0.392149
272	Octyl mercaptan	$C_8H_{18}S$	111-88-6	146.29352	667.3	2.52	0.518	0.235	0.449744
273	1-Octyne	C_8H_{14}	629-05-0	110.19676	574	2.88	0.442	0.267	0.42329
274	Oxalic acid	$C_2H_2O_4$	144-62-7	90.03488	828	8.2	0.227	0.27	0.286278
275	Oxygen	O_2	7782-44-7	31.9988	154.58	5.043	0.0734	0.288	0.0221798
276	Ozone	O_3	10028-15-6	47.9982	261	5.57	0.089	0.228	0.211896
277	Pentadecane	$C_{15}H_{32}$	629-62-9	212.41458	708	1.48	0.969	0.244	0.68632
278	Pentanal	$C_5H_{10}O$	110-62-3	86.1323	566.1	3.845	0.313	0.256	0.313152
279	Pentane	C_5H_{12}	109-66-0	72.14878	469.7	3.37	0.313	0.27	0.251506
280	Pentanoic acid	$C_5H_{10}O_2$	109-52-4	102.132	639.16	3.63	0.35	0.239	0.706632
281	1-Pentanol	$C_5H_{12}O$	71-41-0	88.1482	588.1	3.897	0.326	0.258	0.57483
282	2-Pentanol	$C_5H_{12}O$	6032-29-7	88.1482	561	3.7	0.326	0.259	0.554979
283	2-Pentanone	$C_5H_{10}O$	107-87-9	86.1323	561.08	3.694	0.301	0.238	0.343288
284	3-Pentanone	$C_5H_{10}O$	96-22-0	86.1323	560.95	3.74	0.336	0.269	0.344846
285	1-Pentene	C_5H_{10}	109-67-1	70.1329	464.8	3.56	0.2934	0.27	0.237218
286	2-Pentyl mercaptan	$C_5H_{12}S$	2084-19-7	104.21378	584.3	3.536	0.385	0.28	0.26853
287	Pentyl mercaptan	$C_5H_{12}S$	110-66-7	104.21378	598	3.47	0.359	0.251	0.320705
288	1-Pentyne	C_5H_8	627-19-0	68.11702	481.2	4.17	0.277	0.289	0.289925
289	2-Pentyne	C_5H_8	627-21-4	68.11702	519	4.03	0.276	0.258	0.175199
290	Phenanthrene	$C_{14}H_{10}$	85-01-8	178.2292	869	2.9	0.554	0.222	0.470716
291	Phenol	C_6H_6O	108-95-2	94.11124	694.25	6.13	0.229	0.243	0.44346
292	Phenyl isocyanate	C_7H_5NO	103-71-9	119.1207	653	4.06	0.37	0.277	0.412323
293	Phthalic anhydride	$C_8H_4O_3$	85-44-9	148.11556	791	4.72	0.421	0.302	0.702495
294	Propadiene	C_3H_4	463-49-0	40.06386	394	5.25	0.165	0.264	0.104121
295	Propane	C_3H_8	74-98-6	44.09562	369.83	4.248	0.2	0.276	0.152291
296	1-Propanol	C_3H_8O	71-23-8	60.09502	536.8	5.169	0.219	0.254	0.6209
297	2-Propanol	C_3H_8O	67-63-0	60.095	508.3	4.765	0.222	0.25	0.663
298	Propenylcyclohexene	C_9H_{14}	13511-13-2	122.20746	636	3.12	0.437	0.258	0.341975
299	Propionaldehyde	C_3H_6O	123-38-6	58.07914	503.6	5.038	0.204	0.246	0.281254
300	Propionic acid	$C_3H_6O_2$	79-09-4	74.0785	600.81	4.668	0.235	0.22	0.579579
301	Propionitrile	C_3H_5N	107-12-0	55.0785	561.3	4.26	0.242	0.221	0.350057
302	Propyl acetate	$C_5H_{10}O_2$	109-60-4	102.1317	549.73	3.36	0.345	0.254	0.388902
303	Propyl amine	C_3H_9N	107-10-8	59.11026	496.95	4.74	0.26	0.298	0.279839
304	Propylbenzene	C_9H_{12}	103-65-1	120.19158	638.35	3.2	0.44	0.265	0.344391
305	Propylene	C_3H_6	115-07-1	42.07974	364.85	4.6	0.185	0.281	0.137588
306	Propyl formate	$C_4H_8O_2$	110-74-7	88.10512	538	4.02	0.285	0.256	0.308779
307	2-Propyl mercaptan	C_3H_8S	75-33-2	76.16062	517	4.75	0.254	0.281	0.21381
308	Propyl mercaptan	C_3H_8S	107-03-9	76.16062	536.6	4.63	0.254	0.264	0.231789

309	1,2-Propylene glycol	$C_3H_8O_2$	57-55-6	76.09442	626	6.1	0.239	0.28	1.10651
310	Quinone	$C_6H_4O_2$	106-51-4	108.09476	683	5.96	0.291	0.305	0.494515
311	Silicon tetrafluoride	F_4Si	7783-61-1	104.07911	259	3.72	0.202	0.349	0.38584
312	Styrene	C_8H_8	100-42-5	104.14912	636	3.84	0.352	0.256	0.297097
313	Succinic acid	$C_4H_6O_4$	110-15-6	118.08804	838	5	0.33	0.237	0.743044
314	Sulfur dioxide	O_2S	7446-09-5	64.0638	430.75	7.8841	0.122	0.269	0.245381
315	Sulfur hexafluoride	F_6S	2551-62-4	146.0554192	318.69	3.76	0.19852	0.282	0.215146
316	Sulfur trioxide	O_3S	7446-11-9	80.0632	490.85	8.21	0.127	0.255	0.42396
317	Terephthalic acid	$C_8H_6O_4$	100-21-0	166.13084	883.6	3.486	0.424	0.201	0.94695
318	*o*-Terphenyl	$C_{18}H_{14}$	84-15-1	230.30376	857	2.99	0.731	0.307	0.551265
319	Tetradecane	$C_{14}H_{30}$	629-59-4	198.388	693	1.57	0.897	0.244	0.643017
320	Tetrahydrofuran	C_4H_8O	109-99-9	72.10572	540.15	5.19	0.224	0.259	0.225354
321	1,2,3,4-Tetrahydronaphthalene	$C_{10}H_{12}$	119-64-2	132.20228	720	3.65	0.408	0.249	0.335255
322	Tetrahydrothiophene	C_4H_8S	110-01-0	88.17132	631.95	5.16	0.249	0.245	0.199551
323	2,2,3,3-Tetramethylbutane	C_8H_{18}	594-82-1	114.22852	568	2.87	0.461	0.28	0.244953
324	Thiophene	C_4H_4S	110-02-1	84.13956	579.35	5.69	0.219	0.259	0.196972
325	Toluene	C_7H_8	108-88-3	92.13842	591.75	4.108	0.316	0.264	0.264012
326	1,1,2-Trichloroethane	$C_2H_3Cl_3$	79-00-5	133.40422	602	4.48	0.281	0.252	0.259135
327	Tridecane	$C_{13}H_{28}$	629-50-5	184.36142	675	1.68	0.826	0.247	0.617397
328	Triethyl amine	$C_6H_{15}N$	121-44-8	101.19	535.15	3.04	0.39	0.266	0.316193
329	Trimethyl amine	C_3H_9N	75-50-3	59.11026	433.25	4.07	0.254	0.287	0.206243
330	1,2,3-Trimethylbenzene	C_9H_{12}	526-73-8	120.19158	664.5	3.454	0.414	0.259	0.366553
331	1,2,4-Trimethylbenzene	C_9H_{12}	95-63-6	120.19158	649.1	3.232	0.43	0.258	0.37871
332	2,2,4-Trimethylpentane	C_8H_{18}	540-84-1	114.22852	543.8	2.57	0.468	0.266	0.303455
333	2,3,3-Trimethylpentane	C_8H_{18}	560-21-4	114.22852	573.5	2.82	0.455	0.269	0.2903
334	1,3,5-Trinitrobenzene	$C_6H_3N_3O_6$	99-35-4	213.10452	846	3.39	0.479	0.231	0.862257
335	2,4,6-Trinitrotoluene	$C_7H_5N_3O_6$	118-96-7	227.1311	828	3.04	0.572	0.253	0.897249
336	Undecane	$C_{11}H_{24}$	1120-21-4	156.30826	639	1.95	0.685	0.252	0.530316
337	1-Undecanol	$C_{11}H_{24}O$	112-42-5	172.30766	703.9	2.119	0.715	0.259	0.623622
338	Vinyl acetate	$C_4H_6O_2$	108-05-4	86.08924	519.13	3.958	0.27	0.248	0.351307
339	Vinyl acetylene	C_4H_4	689-97-4	52.07456	454	4.86	0.205	0.264	0.106852
340	Vinyl chloride	C_2H_3Cl	75-01-4	62.49822	432	5.67	0.179	0.283	0.100107
341	Vinyl trichlorosilane	$C_2H_3Cl_3Si$	75-94-5	161.48972	543.15	3.06	0.408	0.276	0.281543
342	Water	H_2O	7732-18-5	18.01528	647.096	22.064	0.0559472	0.229	0.344861
343	*m*-Xylene	C_8H_{10}	108-38-3	106.165	617	3.541	0.375	0.259	0.326485
344	*o*-Xylene	C_8H_{10}	95-47-6	106.165	630.3	3.732	0.37	0.264	0.31013
345	*p*-Xylene	C_8H_{10}	106-42-3	106.165	616.2	3.511	0.378	0.259	0.321839