TABLE 2-95 Enthalpies and Gibbs Energies of Formation, Entropies, and Net Enthalpies of Combustion of Inorganic and Organic Compounds at 298.15 K

Cmpd. no.	Name	Formula	CAS	Mol. wt.	Ideal gas enthalpy of formation, J/kmol × 1E-07	Ideal gas Gibbs energy of formation, J/kmol × 1E-07	Ideal gas entropy, J/(kmol·K) × 1E-05	Standard net enthalpy of combustion, J/kmol × 1E-09
1	Acetaldehyde	C_2H_4O	75-07-0	44.05256	−17.1	−13.78	2.6384	−1.1046
2	Acetamide	C_2H_5NO	60-35-5	59.0672	−23.83	−15.96	2.722	−1.0741
3	Acetic acid	$C_2H_4O_2$	64-19-7	60.052	−43.28	−37.45	2.825	−0.7866
4	Acetic anhydride	$C_4H_6O_3$	108-24-7	102.08864	−57.55	−47.6	3.899	−1.675
5	Acetone	C_3H_6O	67-64-1	58.07914	−21.57	−15.13	2.954	−1.659
6	Acetonitrile	C_2H_3N	75-05-8	41.0519	6.467	8.241	2.438	−1.18118
7	Acetylene	C_2H_2	74-86-2	26.03728	22.82	21.068	2.0081	−1.257
8	Acrolein	C_3H_4O	107-02-8	56.06326	−8.18	−5.68	2.97	−1.5468
9	Acrylic acid	$C_3H_4O_2$	79-10-7	72.06266	−35.591	−30.6	3.15	−1.32717
10	Acrylonitrile	C_3H_3N	107-13-1	53.0626	17.97	18.92	2.77267	−1.71238
11	Air	Mixture	132259-10-0	28.96	0	0	1.94452	0
12	Ammonia	H_3N	7664-41-7	17.03052	−4.5898	−1.64	1.9266	−0.31683
13	Anisole	C_7H_8O	100-66-3	108.13782	−6.79	2.27	3.61	−3.6072
14	Argon	Ar	7440-37-1	39.948	0	0	1.54845	0
15	Benzamide	C_7H_7NO	55-21-0	121.13658	−10.09	−0.211	3.641	−3.39877
16	Benzene	C_6H_6	71-43-2	78.11184	8.288	12.96	2.693	−3.136
17	Benzenethiol	C_6H_6S	108-98-5	110.17684	11.15	14.76	3.369	−3.4474
18	Benzoic acid	$C_7H_6O_2$	65-85-0	122.12134	−29.41	−21.42	3.69	−3.0951
19	Benzonitrile	C_7H_5N	100-47-0	103.1213	21.57	25.8	3.21	−3.524
20	Benzophenone	$C_{13}H_{10}O$	119-61-9	182.2179	5.68	17.3	4.4	−6.2876
21	Benzyl alcohol	C_7H_8O	100-51-6	108.13782	−9.025	−0.254	3.713	−3.56
22	Benzyl ethyl ether	$C_9H_{12}O$	539-30-0	136.19098	−11.5	3.37	4.39	−4.83
23	Benzyl mercaptan	C_7H_8S	100-53-8	124.20342	9.33	16.3	3.607	−4.06
24	Biphenyl	$C_{12}H_{10}$	92-52-4	154.2078	17.849	27.63	3.9367	−6.248
25	Bromine	Br_2	7726-95-6	159.808	3.091	0.314	2.4535	0
26	Bromobenzene	C_6H_5Br	108-86-1	157.0079	10.5018	13.8532	3.24386	−3.01917
27	Bromoethane	C_2H_5Br	74-96-4	108.965	−6.36	−2.574	2.873	−1.301
28	Bromomethane	CH_3Br	74-83-9	94.93852	−3.77	−2.7037	2.421	−0.7185
29	1,2-Butadiene	C_4H_6	590-19-2	54.09044	16.23	19.86	2.93	−2.4617
30	1,3-Butadiene	C_4H_6	106-99-0	54.09044	10.924	14.972	2.7889	−2.409
31	Butane	C_4H_{10}	106-97-8	58.1222	−12.579	−1.67	3.0991	−2.65732
32	1,2-Butanediol	$C_4H_{10}O_2$	584-03-2	90.121	−44.58	−30.44	4.065	−2.2678
33	1,3-Butanediol	$C_4H_{10}O_2$	107-88-0	90.121	−43.32	−29.18	4.065	−2.2824
34	1-Butanol	$C_4H_{10}O$	71-36-3	74.1216	−27.51	−15.07	3.618	−2.454
35	2-Butanol	$C_4H_{10}O$	78-92-2	74.1216	−29.29	−16.7	3.566	−2.446
36	1-Butene	C_4H_8	106-98-9	56.10632	−0.05	7.041	3.074	−2.5408
37	*cis*-2-Butene	C_4H_8	590-18-1	56.10632	−0.74	6.536	3.012	−2.5339
38	*trans*-2-Butene	C_4H_8	624-64-6	56.10632	−1.1	6.32	2.965	−2.53
39	Butyl acetate	$C_6H_{12}O_2$	123-86-4	116.15828	−48.56	−31.26	4.425	−3.28
40	Butylbenzene	$C_{10}H_{14}$	104-51-8	134.21816	−1.314	14.54	4.3949	−5.5644
41	Butyl mercaptan	$C_4H_{10}S$	109-79-5	90.1872	−8.78	1.139	3.752	−2.9554
42	*sec*-Butyl mercaptan	$C_4H_{10}S$	513-53-1	90.1872	−9.66	0.512	3.667	−2.949
43	1-Butyne	C_4H_6	107-00-6	54.09044	16.52	20.225	2.9039	−2.4647
44	Butyraldehyde	C_4H_8O	123-72-8	72.10572	−20.62	−11.48	3.418	−2.301
45	Butyric acid	$C_4H_8O_2$	107-92-6	88.1051	−47.58	−36	3.601	−2.008
46	Butyronitrile	C_4H_7N	109-74-0	69.1051	3.342	10.57	3.337	−2.4146
47	Carbon dioxide	CO_2	124-38-9	44.0095	−39.351	−39.437	2.13677	
48	Carbon disulfide	CS_2	75-15-0	76.1407	11.69	6.68	2.379	−1.0769
49	Carbon monoxide	CO	630-08-0	28.0101	−11.053	−13.715	1.97556	−0.283

(*Continued*)

99	Difluoromethane	CH_2F_2	75-10-5	52.02339	−45.23	−42.4747	2.4658	−0.183031
100	Diisopropyl amine	$C_6H_{15}N$	108-18-9	101.19	−14.38	6.42	4.12	−3.99
101	Diisopropyl ether	$C_6H_{14}O$	108-20-3	102.17476	−31.92	−12.48	3.989	−3.70261
102	Diisopropyl ketone	$C_7H_{14}O$	565-80-0	114.18546	−31.14	−12.37	4.27	−4.095
103	1,1-Dimethoxyethane	$C_4H_{10}O_2$	534-15-6	90.121	−38.97	−23.8	3.726	−2.394
104	1,2-Dimethoxypropane	$C_5H_{12}O_2$	7778-85-0	104.14758	−38.42	−20.11	4.038	−2.996
105	Dimethyl acetylene	C_4H_6	503-17-3	54.09044	14.57	18.49	2.833	−2.4189
106	Dimethyl amine	C_2H_7N	124-40-3	45.08368	−1.845	6.839	2.7296	−1.6146
107	2,3-Dimethylbutane	C_6H_{14}	79-29-8	86.17536	−17.68	−0.3125	3.6592	−3.84761
108	1,1-Dimethylcyclohexane	C_8H_{16}	590-66-9	112.21264	−18.1	3.52293	3.65012	−4.8639
109	*cis*-1,2-Dimethylcyclohexane	C_8H_{16}	2207-01-4	112.21264	−17.2172	4.12124	3.7451	−4.87084
110	*trans*-1,2-Dimethylcyclohexane	C_8H_{16}	6876-23-9	112.21264	−17.9996	3.44761	3.70912	−4.86436
111	Dimethyl disulfide	$C_2H_6S_2$	624-92-0	94.19904	−2.42	1.516	3.35291	−2.0441
112	Dimethyl ether	C_2H_6O	115-10-6	46.06844	−18.41	−11.28	2.667	−1.3284
113	*N,N*-Dimethyl formamide	C_3H_7NO	68-12-2	73.09378	−19.17	−8.84	3.26	−1.78871
114	2,3-Dimethylpentane	C_7H_{16}	565-59-3	100.20194	−19.41	0.5717	4.1455	−4.46075
115	Dimethyl phthalate	$C_{10}H_{10}O_4$	131-11-3	194.184	−60.5	−46.7749	6.6	−4.4662
116	Dimethylsilane	C_2H_8Si	1111-74-6	60.17042	−9.47	−1.925	2.9953	−2.569
117	Dimethyl sulfide	C_2H_6S	75-18-3	62.134	−3.724	0.7302	2.8585	−1.7443
118	Dimethyl sulfoxide	C_2H_6OS	67-68-5	78.13344	−15.046	−8.1441	3.0627	−1.6054
119	Dimethyl terephthalate	$C_{10}H_{10}O_4$	120-61-6	194.184	−62.742	−41.97	4.245	−4.41057
120	1,4-Dioxane	$C_4H_8O_2$	123-91-1	88.10512	−31.58	−18.16	3.0012	−2.1863
121	Diphenyl ether	$C_{12}H_{10}O$	101-84-8	170.2072	5.2	17.5	4.13	−5.8939
122	Dipropyl amine	$C_6H_{15}N$	142-84-7	101.19	−11.6	11.96	3.2	−4.0189
123	Dodecane	$C_{12}H_{26}$	112-40-3	170.33484	−29.072	4.981	6.2415	−7.51368
124	Eicosane	$C_{20}H_{42}$	112-95-8	282.54748	−45.646	11.57	9.3787	−12.3908
125	Ethane	C_2H_6	74-84-0	30.069	−8.382	−3.192	2.2912	−1.42864
126	Ethanol	C_2H_6O	64-17-5	46.06844	−23.495	−16.785	2.8064	−1.235
127	Ethyl acetate	$C_4H_8O_2$	141-78-6	88.10512	−44.45	−32.8	3.597	−2.061
128	Ethyl amine	C_2H_7N	75-04-7	45.08368	−4.715	3.616	2.848	−1.5874
129	Ethylbenzene	C_8H_{10}	100-41-4	106.165	2.992	13.073	3.6063	−4.3448
130	Ethyl benzoate	$C_9H_{10}O_2$	93-89-0	150.1745	−32.6	−19.05	4.55	−4.41
131	2-Ethyl butanoic acid	$C_6H_{12}O_2$	88-09-5	116.15828	−53.78	−35.9	4.23	−3.21203
132	Ethyl butyrate	$C_6H_{12}O_2$	105-54-4	116.15828	−48.55	−31.22	4.417	−3.284
133	Ethylcyclohexane	C_8H_{16}	1678-91-7	112.21264	−17.15	3.955	3.826	−4.87051
134	Ethylcyclopentane	C_7H_{14}	1640-89-7	98.18606	−12.69	4.48	3.783	−4.2839
135	Ethylene	C_2H_4	74-85-1	28.05316	5.251	6.844	2.192	−1.323
136	Ethylenediamine	$C_2H_8N_2$	107-15-3	60.09832	−1.73	10.3	3.21833	−1.691
137	Ethylene glycol	$C_2H_6O_2$	107-21-1	62.06784	−39.22	−30.18	3.04891	−1.0527
138	Ethyleneimine	C_2H_5N	151-56-4	43.0678	12.3428	17.7987	2.5062	−1.481
139	Ethylene oxide	C_2H_4O	75-21-8	44.05256	−5.263	−1.323	2.4299	−1.218
140	Ethyl formate	$C_3H_6O_2$	109-94-4	74.07854	−38.83	−30.31	3.282	−1.50696
141	2-Ethyl hexanoic acid	$C_8H_{16}O_2$	149-57-5	144.211	−55.95	−32.49	5.097	−4.448
142	Ethylhexyl ether	$C_8H_{18}O$	5756-43-4	130.22792	−33.37	−9.042	5.076	−4.943
143	Ethylisopropyl ether	$C_5H_{12}O$	625-54-7	88.14818	−28.58	−12.64	3.8	−3.103
144	Ethylisopropyl ketone	$C_6H_{12}O$	565-69-5	100.15888	−28.61	−13.3	4.069	−3.4863
145	Ethyl mercaptan	C_2H_6S	75-08-1	62.13404	−4.63	−0.4814	2.961	−1.7366
146	Ethyl propionate	$C_5H_{10}O_2$	105-37-3	102.1317	−46.36	−31.93	4.025	−2.674
147	Ethylpropyl ether	$C_5H_{12}O$	628-32-0	88.14818	−27.22	−11.52	3.881	−3.12
148	Ethyltrichlorosilane	$C_2H_5Cl_3Si$	115-21-9	163.506	−59.15	−50.66	4.07	−1.67471
149	Fluorine	F_2	7782-41-4	37.9968064	0	0	2.02789	
150	Fluorobenzene	C_6H_5F	462-06-6	96.1023032	−11.6566	−6.9036	3.02629	−2.81451

(*Continued*)

TABLE 2-95 Enthalpies and Gibbs Energies of Formation, Entropies, and Net Enthalpies of Combustion of Inorganic and Organic Compounds at 298.15 K (*Continued*)

Cmpd. no.	Name	Formula	CAS	Mol. wt.	Ideal gas enthalpy of formation, J/kmol × 1E-07	Ideal gas Gibbs energy of formation, J/kmol × 1E-07	Ideal gas entropy, J/(kmol·K) × 1E-05	Standard net enthalpy of combustion, J/kmol × 1E-09
151	Fluoroethane	C_2H_5F	353-36-6	48.0595	−26.44	−21.23	2.644	−1.127
152	Fluoromethane	CH_3F	593-53-3	34.03292	−23.43	−21.03	2.22734	−0.5219
153	Formaldehyde	CH_2O	50-00-0	30.02598	−10.86	−10.26	2.19	−0.5268
154	Formamide	CH_3NO	75-12-7	45.04062	−19.22	−14.71	2.4857	−0.5021
155	Formic acid	CH_2O_2	64-18-6	46.0257	−37.88	−35.11	2.487	−0.2115
156	Furan	C_4H_4O	110-00-9	68.07396	−3.48	0.08225	2.6714	−1.9959
157	Helium-4	He	7440-59-7	4.0026	0	0	1.26152	0
158	Heptadecane	$C_{17}H_{36}$	629-78-7	240.46774	−39.445	9.083	8.2023	−10.5618
159	Heptanal	$C_7H_{14}O$	111-71-7	114.18546	−26.48	−8.367	4.5	−4.136
160	Heptane	C_7H_{16}	142-82-5	100.20194	−18.765	0.8165	4.2798	−4.46473
161	Heptanoic acid	$C_7H_{14}O_2$	111-14-8	130.185	−53.62	−33.4	4.8	−3.839
162	1-Heptanol	$C_7H_{16}O$	111-70-6	116.20134	−33.68	−12.55	4.795	−4.285
163	2-Heptanol	$C_7H_{16}O$	543-49-7	116.20134	−35.3	−13.7	4.66	−4.27
164	3-Heptanone	$C_7H_{14}O$	106-35-4	114.18546	−30.1	−12.25	4.58	−4.098
165	2-Heptanone	$C_7H_{14}O$	110-43-0	114.18546	−30.0453	−11.96	4.486	−4.09952
166	1-Heptene	C_7H_{14}	592-76-7	98.18606	−6.289	9.482	4.252	−4.3499
167	Heptyl mercaptan	$C_7H_{16}S$	1639-09-4	132.26694	−14.95	3.622	4.939	−4.7865
168	1-Heptyne	C_7H_{12}	628-71-7	96.17018	10.3	22.7	4.085	−4.2717
169	Hexadecane	$C_{16}H_{34}$	544-76-3	226.44116	−37.417	8.216	7.8102	−9.95145
170	Hexanal	$C_6H_{12}O$	66-25-1	100.15888	−24.8	−9.92	4.22	−3.524
171	Hexane	C_6H_{14}	110-54-3	86.17536	−16.694	−0.006634	3.8874	−3.8551
172	Hexanoic acid	$C_6H_{12}O_2$	142-62-1	116.158	−51.19	−33.8	4.41	−3.23
173	1-Hexanol	$C_6H_{14}O$	111-27-3	102.17476	−31.62	−13.39	4.402	−3.675
174	2-Hexanol	$C_6H_{14}O$	626-93-7	102.175	−33.46	−15.06	4.349	−3.67
175	2-Hexanone	$C_6H_{12}O$	591-78-6	100.15888	−27.9826	−13.0081	4.17856	−3.49
176	3-Hexanone	$C_6H_{12}O$	589-38-8	100.15888	−27.76	−12.6	4.092	−3.492
177	1-Hexene	C_6H_{12}	592-41-6	84.15948	−4.167	8.7	3.863	−3.7397
178	3-Hexyne	C_6H_{10}	928-49-4	82.1436	10.6	19.9	3.76	−3.64
179	Hexyl mercaptan	$C_6H_{14}S$	111-31-9	118.24036	−12.92	2.759	4.546	−4.1762
180	1-Hexyne	C_6H_{10}	693-02-7	82.1436	12.37	21.85	3.694	−3.661
181	2-Hexyne	C_6H_{10}	764-35-2	82.1436	10.5	19.9	3.72	−3.64
182	Hydrazine	H_4N_2	302-01-2	32.04516	9.5353	15.917	2.3861	−0.5342
183	Hydrogen	H_2	1333-74-0	2.01588	0	0	1.30571	−0.24182
184	Hydrogen bromide	BrH	10035-10-6	80.91194	−3.629	−5.334	1.98591	−0.06904
185	Hydrogen chloride	ClH	7647-01-0	36.46094	−9.231	−9.53	1.86786	−0.0286
186	Hydrogen cyanide	CHN	74-90-8	27.02534	13.5143	12.4725	2.01719	−0.62329
187	Hydrogen fluoride	FH	7664-39-3	20.0063432	−27.33	−27.54	1.7367	0.1524
188	Hydrogen sulfide	H_2S	7783-06-4	34.08088	−2.063	−3.344	2.056	−0.518
189	Isobutyric acid	$C_4H_8O_2$	79-31-2	88.10512	−48.41	−36.21	3.412	−2.0004
190	Isopropyl amine	C_3H_9N	75-31-0	59.11026	−8.38	3.192	3.124	−2.1566
191	Malonic acid	$C_3H_4O_4$	141-82-2	104.06146	−77.89	−69.29	4.003	−0.7732
192	Methacrylic acid	$C_4H_6O_2$	79-41-4	86.08924	−36.8	−28.8	3.5	−1.93
193	Methane	CH_4	74-82-8	16.0425	−7.452	−5.049	1.8627	−0.80262
194	Methanol	CH_4O	67-56-1	32.04186	−20.094	−16.232	2.3988	−0.6382
195	*N*-Methyl acetamide	C_3H_7NO	79-16-3	73.09378	−24	−13.5	3.2	−1.71
196	Methyl acetate	$C_3H_6O_2$	79-20-9	74.07854	−41.19	−32.42	3.198	−1.461
197	Methyl acetylene	C_3H_4	74-99-7	40.06386	18.49	19.384	2.4836	−1.8487
198	Methyl acrylate	$C_4H_6O_2$	96-33-3	86.08924	−33.3	−25.7	3.66	−1.9303
199	Methyl amine	CH_5N	74-89-5	31.0571	−2.297	3.207	2.433	−0.97508

200	Methyl benzoate	$C_8H_8O_2$	93-58-3	136.14792	−28.79	−18.1	4.14	−3.772
201	3-Methyl-1,2-butadiene	C_5H_8	598-25-4	68.11702	12.908	19.75	3.2151	−3.032
202	2-Methylbutane	C_5H_{12}	78-78-4	72.14878	−15.37	−1.405	3.4374	−3.23954
203	2-Methylbutanoic acid	$C_5H_{10}O_2$	116-53-0	102.1317	−49.8	−34.99	3.9	−2.622
204	3-Methyl-1-butanol	$C_5H_{12}O$	123-51-3	88.1482	−30.3	−14.54	3.869	−3.062
205	2-Methyl-1-butene	C_5H_{10}	563-46-2	70.1329	−3.53	6.668	3.395	−3.1159
206	2-Methyl-2-butene	C_5H_{10}	513-35-9	70.1329	−4.18	6.045	3.386	−3.1088
207	2-Methyl -1-butene-3-yne	C_5H_6	78-80-8	66.10114	26	30.25	2.78	−2.93
208	Methylbutyl ether	$C_5H_{12}O$	628-28-4	88.14818	−25.81	−10.17	3.901	−3.12818
209	Methylbutyl sulfide	$C_5H_{12}S$	628-29-5	104.214	−10.2	2.691	4.118	−3.5723
210	3-Methyl-1-butyne	C_5H_8	598-23-2	68.11702	13.8	20.72	3.189	−3.046
211	Methyl butyrate	$C_5H_{10}O_2$	623-42-7	102.1317	−45.07	−30.53	3.988	−2.686
212	Methylchlorosilane	CH_5ClSi	993-00-0	80.5889	−21.5	−16.61	2.98277	−1.693
213	Methylcyclohexane	C_7H_{14}	108-87-2	98.18606	−15.48	2.733	3.433	−4.25714
214	1-Methylcyclohexanol	$C_7H_{14}O$	590-67-0	114.18546	−33.2	−12.9	3.75	−4.058
215	*cis*-2-Methylcyclohexanol	$C_7H_{14}O$	7443-70-1	114.18546	−32.7	−12.68	3.853	−4.0574
216	*trans*-2-Methylcyclohexanol	$C_7H_{14}O$	7443-52-9	114.18546	−35.26	−15.24	3.853	−4.0318
217	Methylcyclopentane	C_6H_{12}	96-37-7	84.15948	−10.62	3.63	3.399	−3.6741
218	1-Methylcyclopentene	C_6H_{10}	693-89-0	82.1436	−0.38	10.38	3.264	−3.534
219	3-Methylcyclopentene	C_6H_{10}	1120-62-3	82.1436	0.74	11.38	3.305	−3.5464
220	Methyldichlorosilane	CH_4Cl_2Si	75-54-7	115.03396	−40.2	−34.83	3.287	−1.357
221	Methylethyl ether	C_3H_8O	540-67-0	60.09502	−21.64	−11.71	3.0881	−1.9314
222	Methylethyl ketone	C_4H_8O	78-93-3	72.10572	−23.9	−14.7	3.394	−2.268
223	Methylethyl sulfide	C_3H_8S	624-89-5	76.1606	−5.96	1.147	3.332	−2.354
224	Methyl formate	$C_2H_4O_2$	107-31-3	60.05196	−35.24	−29.5	2.852	−0.8924
225	Methylisobutyl ether	$C_5H_{12}O$	625-44-5	88.14818	−26.6	−10.7	3.81	−3.122
226	Methylisobutyl ketone	$C_6H_{12}O$	108-10-1	100.15888	−28.64	−13.51	4.129	−3.4762
227	Methyl Isocyanate	C_2H_3NO	624-83-9	57.05132	−6.24	0.0244	1.955	−1.06
228	Methylisopropyl ether	$C_4H_{10}O$	598-53-8	74.1216	−25.2	−12.18	3.416	−2.5311
229	Methylisopropyl ketone	$C_5H_{10}O$	563-80-4	86.1323	−26.26	−13.93	3.699	−2.877
230	Methylisopropyl sulfide	$C_4H_{10}S$	1551-21-9	90.1872	−8.96	1.4509	3.59	−2.957
231	Methyl mercaptan	CH_4S	74-93-1	48.10746	−2.29	−0.98	2.55	−1.1517
232	Methyl methacrylate	$C_5H_8O_2$	80-62-6	100.11582	−36	−25.4	4.01	−2.54
233	2-Methyloctanoic acid	$C_9H_{18}O_2$	3004-93-1	158.23802	−57.95	−31.8	5.533	−5.056
234	2-Methylpentane	C_6H_{14}	107-83-5	86.17536	−17.455	−0.5338	3.8089	−3.84915
235	Methyl pentyl ether	$C_6H_{14}O$	628-80-8	102.17476	−27.8	−9.321	4.32	−3.739
236	2-Methylpropane	C_4H_{10}	75-28-5	58.1222	−13.499	−2.144	2.955	−2.64812
237	2-Methyl-2-propanol	$C_4H_{10}O$	75-65-0	74.1216	−31.24	−17.76	3.263	−2.4239
238	2-Methyl propene	C_4H_8	115-11-7	56.10632	−1.71	5.808	2.9309	−2.5242
239	Methyl propionate	$C_4H_8O_2$	554-12-1	88.10512	−42.75	−31.1	3.596	−2.078
240	Methylpropyl ether	$C_4H_{10}O$	557-17-5	74.1216	−23.82	−11.1	3.52	−2.51739
241	Methylpropyl sulfide	$C_4H_{10}S$	3877-15-4	90.1872	−8.23	1.793	3.717	−2.962
242	Methylsilane	CH_6Si	992-94-9	46.14384	−2.91	1.853	2.565	−1.999
243	alpha-Methyl styrene	C_9H_{10}	98-83-9	118.1757	11.83	21.73	3.725	−4.8214
244	Methyl tert-butyl ether	$C_5H_{12}O$	1634-04-4	88.1482	−28.3	−11.7	3.58	−3.11
245	Methyl vinyl ether	C_3H_6O	107-25-5	58.07914	−10.8	−4.73	3.08	−1.77431
246	Naphthalene	$C_{10}H_8$	91-20-3	128.17052	15.058	22.408	3.3315	−4.9809
247	Neon	Ne	7440-01-9	20.1797	0	0	1.46327	0
248	Nitroethane	$C_2H_5NO_2$	79-24-3	75.0666	−10.21	−0.6125	3.168	−1.25
249	Nitrogen	N_2	7727-37-9	28.0134	0	0	1.91609	
250	Nitrogen trifluoride	F_3N	7783-54-2	71.0019096	−13.2089	−9.063	2.60773	

(*Continued*)

TABLE 2-95 Enthalpies and Gibbs Energies of Formation, Entropies, and Net Enthalpies of Combustion of Inorganic and Organic Compounds at 298.15 K (*Continued*)

Cmpd. no.	Name	Formula	CAS	Mol. wt.	Ideal gas enthalpy of formation, J/kmol × 1E-07	Ideal gas Gibbs energy of formation, J/kmol × 1E-07	Ideal gas entropy, J/(kmol·K) × 1E-05	Standard net enthalpy of combustion, J/kmol × 1E-09
251	Nitromethane	CH_3NO_2	75-52-5	61.04002	−7.47	−0.6934	2.751	−0.6432
252	Nitrous oxide	N_2O	10024-97-2	44.0128	8.205	10.416	2.1985	−0.0820482
253	Nitric oxide	NO	10102-43-9	30.0061	9.025	8.657	2.106	−0.0902489
254	Nonadecane	$C_{19}H_{40}$	629-92-5	268.5209	−43.579	10.74	8.9866	−11.7812
255	Nonanal	$C_9H_{18}O$	124-19-6	142.23862	−31.09	−7.136	5.266	−5.35
256	Nonane	C_9H_{20}	111-84-2	128.2551	−22.874	2.498	5.064	−5.68455
257	Nonanoic acid	$C_9H_{18}O_2$	112-05-0	158.238	−57.73	−31.7	5.59	−5.061
258	1-Nonanol	$C_9H_{20}O$	143-08-8	144.2545	−37.79	−10.86	5.579	−5.506
259	2-Nonanol	$C_9H_{20}O$	628-99-9	144.255	−39.71	−12.61	5.523	−5.506
260	1-Nonene	C_9H_{18}	124-11-8	126.23922	−10.35	11.23	5.041	−5.5716
261	Nonyl mercaptan	$C_9H_{20}S$	1455-21-6	160.3201	−19.08	5.28	5.724	−6.006
262	1-Nonyne	C_9H_{16}	3452-09-3	124.22334	6.17	24.34	4.8699	−5.493
263	Octadecane	$C_{18}H_{38}$	593-45-3	254.49432	−41.512	9.91	8.5945	−11.1715
264	Octanal	$C_8H_{16}O$	124-13-0	128.212	−29.02	−8	4.896	−4.74
265	Octane	C_8H_{18}	111-65-9	114.22852	−20.875	1.6	4.6723	−5.07415
266	Octanoic acid	$C_8H_{16}O_2$	124-07-2	144.211	−55.6	−32.5	5.2	−4.448
267	1-Octanol	$C_8H_{18}O$	111-87-5	130.22792	−35.73	−11.7	5.187	−4.895
268	2-Octanol	$C_8H_{18}O$	123-96-6	130.228	−37.62	−13.43	5.132	−4.894
269	2-Octanone	$C_8H_{16}O$	111-13-7	128.21204	−32.16	−11.38	4.962	−4.6984
270	3-Octanone	$C_8H_{16}O$	106-68-3	128.21204	−33.9	−12.81	4.879	−4.711
271	1-Octene	C_8H_{16}	111-66-0	112.21264	−8.194	10.57	4.637	−4.961
272	Octyl mercaptan	$C_8H_{18}S$	111-88-6	146.29352	−17.01	4.457	5.331	−5.3962
273	1-Octyne	C_8H_{14}	629-05-0	110.19676	8.23	23.5	4.478	−4.88145
274	Oxalic acid	$C_2H_2O_4$	144-62-7	90.03488	−71.95	−66.24	3.608	−0.1989
275	Oxygen	O_2	7782-44-7	31.9988	0	0	2.05147	0
276	Ozone	O_3	10028-15-6	47.9982	14.2671	16.3164	2.38823	−0.142671
277	Pentadecane	$C_{15}H_{32}$	629-62-9	212.41458	−35.311	7.426	7.4181	−9.34237
278	Pentanal	$C_5H_{10}O$	110-62-3	86.1323	−22.78	−10.67	3.777	−2.91
279	Pentane	C_5H_{12}	109-66-0	72.14878	−14.676	−0.8813	3.4945	−3.24494
280	Pentanoic acid	$C_5H_{10}O_2$	109-52-4	102.132	−49.13	−34.7	4.02	−2.617
281	1-Pentanol	$C_5H_{12}O$	71-41-0	88.1482	−29.57	−14.23	4.01	−3.064
282	2-Pentanol	$C_5H_{12}O$	6032-29-7	88.1482	−31.37	−15.88	3.958	−3.058
283	2-Pentanone	$C_5H_{10}O$	107-87-9	86.1323	−25.92	−13.83	3.786	−2.87956
284	3-Pentanone	$C_5H_{10}O$	96-22-0	86.1323	−25.79	−13.44	3.7	−2.8804
285	1-Pentene	C_5H_{10}	109-67-1	70.1329	−2.162	7.837	3.462	−3.13037
286	2-Pentyl mercaptan	$C_5H_{12}S$	2084-19-7	104.21378	−11.3	1.814	4.05	−3.564
287	Pentyl mercaptan	$C_5H_{12}S$	110-66-7	104.21378	−10.84	1.94408	4.154	−3.5641
288	1-Pentyne	C_5H_8	627-19-0	68.11702	14.44	21.03	3.298	−3.051
289	2-Pentyne	C_5H_8	627-21-4	68.11702	12.89	19.45	3.3084	−3.0291
290	Phenanthrene	$C_{14}H_{10}$	85-01-8	178.2292	20.12	30.219	3.945	−6.8282
291	Phenol	C_6H_6O	108-95-2	94.11124	−9.6399	−3.2637	3.1481	−2.921
292	Phenyl isocyanate	C_7H_5NO	103-71-9	119.1207	−1.454	4.87212	3.527	−3.298
293	Phthalic anhydride	$C_8H_4O_3$	85-44-9	148.11556	−37.14	−30.7001	3.995	−3.1715
294	Propadiene	C_3H_4	463-49-0	40.06386	19.05	20.08	2.439	−1.8563
295	Propane	C_3H_8	74-98-6	44.09562	−10.468	−2.439	2.702	−2.04311
296	1-Propanol	C_3H_8O	71-23-8	60.09502	−25.46	−15.99	3.226	−1.844
297	2-Propanol	C_3H_8O	67-63-0	60.095	−27.21	−17.52	3.175	−1.834
298	Propenylcyclohexene	C_9H_{14}	13511-13-2	122.20746	4.677	20.85	4.233	−5.232
299	Propionaldehyde	C_3H_6O	123-38-6	58.07914	−18.49	−12.37	3.065	−1.684

300	Propionic acid	$C_3H_6O_2$	79-09-4	74.0785	−45.35	−35.82	2.949	−1.395
301	Propionitrile	C_3H_5N	107-12-0	55.0785	5.155	9.688	2.877	−1.80056
302	Propyl acetate	$C_5H_{10}O_2$	109-60-4	102.1317	−46.48	−32.04	4.023	−2.672
303	Propyl amine	C_3H_9N	107-10-8	59.11026	−7.05	4.17	3.242	−2.165
304	Propylbenzene	C_9H_{12}	103-65-1	120.19158	0.79	13.76	4.0014	−4.95415
305	Propylene	C_3H_6	115-07-1	42.07974	2.023	6.264	2.67	−1.9262
306	Propyl formate	$C_4H_8O_2$	110-74-7	88.10512	−40.76	−29.36	3.678	−2.041
307	2-Propyl mercaptan	C_3H_8S	75-33-2	76.16062	−7.59	−0.218	3.243	−2.3398
308	Propyl mercaptan	C_3H_8S	107-03-9	76.16062	−6.75	0.2583	3.365	−2.3458
309	1,2-Propylene glycol	$C_3H_8O_2$	57-55-6	76.09442	−42.15	−30.4	3.52	−1.6476
310	Quinone	$C_6H_4O_2$	106-51-4	108.09476	−12.29	−6.92	3.205	−2.658
311	Silicon tetrafluoride	F_4Si	7783-61-1	104.0791128	−161.494	−157.27	2.82651	0.7055
312	Styrene	C_8H_8	100-42-5	104.14912	14.74	21.39	3.451	−4.219
313	Succinic acid	$C_4H_6O_4$	110-15-6	118.08804	−81.6	−70.11	4.398	−1.3591
314	Sulfur dioxide	O_2S	7446-09-5	64.0638	−29.684	−30.012	2.481	
315	Sulfur hexafluoride	F_6S	2551-62-4	146.0554192	−122.047	−111.653	2.91625	0.924
316	Sulfur trioxide	O_3S	7446-11-9	80.0632	−39.572	−37.095	2.5651	0.1422
317	Terephthalic acid	$C_8H_6O_4$	100-21-0	166.13084	−66.94	−55.01	4.48	−3.19
318	*o*-Terphenyl	$C_{18}H_{14}$	84-15-1	230.30376	27.66	42.3	5.263	−9.053
319	Tetradecane	$C_{14}H_{30}$	629-59-4	198.388	−33.244	6.599	7.0259	−8.73282
320	Tetrahydrofuran	C_4H_8O	109-99-9	72.10572	−18.418	−7.969	2.9729	−2.325
321	1,2,3,4-Tetrahydronaphthalene	$C_{10}H_{12}$	119-64-2	132.20228	2.661	16.71	3.6964	−5.3575
322	Tetrahydrothiophene	C_4H_8S	110-01-0	88.17132	−3.376	4.59	3.1	−2.76549
323	2,2,3,3-Tetramethylbutane	C_8H_{18}	594-82-1	114.22852	−22.56	2.239	3.893	−5.0639
324	Thiophene	C_4H_4S	110-02-1	84.13956	11.544	12.67	2.784	−2.4352
325	Toluene	C_7H_8	108-88-3	92.13842	5.017	12.22	3.2099	−3.734
326	1,1,2-Trichloroethane	$C_2H_3Cl_3$	79-00-5	133.40422	−14.2	−8.097	3.371	−0.9685
327	Tridecane	$C_{13}H_{28}$	629-50-5	184.36142	−31.177	5.771	6.6337	−8.1229
328	Triethyl amine	$C_6H_{15}N$	121-44-8	101.19	−9.58	11.41	4.054	−4.0405
329	Trimethyl amine	C_3H_9N	75-50-3	59.11026	−2.431	9.899	2.87	−2.2449
330	1,2,3-Trimethylbenzene	C_9H_{12}	526-73-8	120.19158	−0.95	12.61	3.805	−4.934
331	1,2,4-Trimethylbenzene	C_9H_{12}	95-63-6	120.19158	−1.38	11.71	3.961	−4.9307
332	2,2,4-Trimethylpentane	C_8H_{18}	540-84-1	114.22852	−22.401	1.394	4.2296	−5.06528
333	2,3,3-Trimethylpentane	C_8H_{18}	560-21-4	114.22852	−21.845	1.828	4.2702	−5.06876
334	1,3,5-Trinitrobenzene	$C_6H_3N_3O_6$	99-35-4	213.10452	6.24	26.79	4.435	−2.6867
335	2,4,6-Trinitrotoluene	$C_7H_5N_3O_6$	118-96-7	227.1311	4.34	28.44	4.607	−3.2959
336	Undecane	$C_{11}H_{24}$	1120-21-4	156.30826	−27.043	4.116	5.8493	−6.9036
337	1-Undecanol	$C_{11}H_{24}O$	112-42-5	172.30766	−41.9	−9.177	6.363	−6.726
338	Vinyl acetate	$C_4H_6O_2$	108-05-4	86.08924	−31.49	−22.79	3.28	−1.95
339	Vinyl acetylene	C_4H_4	689-97-4	52.07456	30.46	30.6	2.794	−2.362
340	Vinyl chloride	C_2H_3Cl	75-01-4	62.49822	2.845	4.195	2.7354	−1.178
341	Vinyl trichlorosilane	$C_2H_3Cl_3Si$	75-94-5	161.48972	−48.116	−42.5514	3.73966	−1.544
342	Water	H_2O	7732-18-5	18.01528	−24.1818	−22.8572	1.88825	
343	*m*-Xylene	C_8H_{10}	108-38-3	106.165	1.732	11.876	3.5854	−4.3318
344	*o*-Xylene	C_8H_{10}	95-47-6	106.165	1.908	12.2	3.5383	−4.333
345	*p*-Xylene	C_8H_{10}	106-42-3	106.165	1.803	12.14	3.52165	−4.333

The compounds are considered to be formed from the elements in their standard states at 298.15 K and 1 bar. These include C (graphite) and S (rhombic). Enthalpy of combustion is the net value for the compound in its standard state at 298.15 K and 1 bar. Products of combustion are taken to be CO_2 (gas), H_2O (gas), F_2(gas), Cl_2 (gas), Br_2 (gas), I_2 (gas), SO_2 (gas), N_2 (gas), P_4O_{10} (crystalline), SiO_2 (crystobalite), and Al_2O_3 (crystal, alpha).