STANDARD THERMOCHEMICAL FUNCTIONS

Enthalpy of formation h_f, Gibbs function of formation g_f, and absolute entropy s, at the standard state of T=298.15 K and p=100 kPa. In alphabetical order by the chemical formula.

Substance	Formula (state)	h_f kJ/mol	g_f kJ/mol	s J/(mol K)
Aluminium	Al(s)	0	0	28
Aluminium hydroxide	$Al(OH)_3$(s)	-1280	-1146	85
Aluminium oxide	Al_2O_3(s)	-1680	-1580	51
Carbon (graphite)	C(s)	0	0	5.74
Carbon (diamond)	C(s)	1.90	2.89	2.38
Methane	CH_4(g)	-74.85	-50.79	186.16
Methanol (ideal vapour state)	CH_4O(g)	-200.7	-162	239.7
Methanol	CH_4O(l)	-238.81	-166.29	126.8
Acetylene	C_2H_2(g)	226.73	209.17	200.8
Ethylene	C_2H_4(g)	52.28	68.12	219.8
Ethane	C_2H_6(g)	-84.68	-32.89	229.5
Ethanol (ideal vapour state)	C_2H_6O(g)	-238.4	-169	272
Ethanol	C_2H_6O(l)	-277.7	-174.9	160.7
DME (dimethyl ether)	C_2H_6O(g)	-184.10	-112.60	266.4
Propylene (propene)	C_3H_6(g)	20.41	62.72	267
n-Propane	C_3H_8(g)	-103.85	-25	270
n-Propane (ideal liquid state)*	C_3H_8(l)	-121.2	-18	194
n-Butane	C_4H_{10}(g)	-126.15	-17.9	310.0
n-Butane (ideal liquid state)*	C_4H_{10}(l)	-146	-18	240
Isobutane (2-methylpropane)	C_4H_{10}(g)	-134	-20	295
Isobutane (ideal liquid state)*	C_4H_{10}(l)	-154	-18.5	225
Ether (DEE ideal vapour state)	$C_4H_{10}0$(g)	-252.7	-137	342
Ether (DEE, diethyl ether)	$C_4H_{10}0$(l)	-271.2	-145	253
n-Pentane (ideal vapour state)	C_5H_{12}(g)	-146.44	-8	348.4
n-Pentane	C_5H_{12}(l)	-173	-9	263
Benzene (ideal vapour state)	C_6H_6(g)	82.6	130	269.3
Benzene	C_6H_6(l)	49.10	120	173.3
Glucose	$C_6H_{12}O_6$(s)	-1268	-910	212
n-Hexane (ideal vapour state)	C_6H_{14}(g)	-167	0.4	387
n-Hexane	C_6H_{14}(l)	-198.8	-4	296
n-Heptane (ideal vapour state)	C_7H_{16}(g)	-180	16	428
n-Heptane	C_7H_{16}(l)	-225	1	328
n-Octane (ideal vapour state)	C_8H_{18}(g)	-208	17	464
n-Octane	C_8H_{18}(l)	-250	6	361
iso-Octane (ideal vapour state)	C_8H_{18}(g)	-224	12.3	428
iso-Octane	C_8H_{18}(l)	-260	5.8	329
Naphthalene	$C_{10}H_8$(s)	76	199	167

n-Decane	$C_{10}H_{22}(l)$	-250	34.4	540
Sucrose	$C_{12}H_{22}O_{11}(s)$	-2222	-1545	360
n-Dodecene-1 (ideal vapour state)	$C_{12}H_{24}(g)$	-165	147	589
n-Dodecene-1	$C_{12}H_{24}(l)$	-226	117	485
n-Dodecane (ideal vapour state)	$C_{12}H_{26}(g)$	-291	50.2	623
n-Dodecane	$C_{12}H_{26}(l)$	-351	28	493
n-Hexadecane (cetane)	$C_{16}H_{34}(l)$	-456	58.5	586
Carbon monoxide	$CO(g)$	-110.53	-137.15	197.6
Carbon dioxide	$CO_2(g)$	-393.52	-394.38	213.67
Urea	$CO(NH_2)_2(s)$	-333.5	-197.3	104.6
Iron	$Fe(s)$	0	0	27
Iron (II) oxide	$FeO(s)$	-267	-257	59
Iron (III) oxide	$Fe_2O_3(s)$	-822	-791	90
Iron (II)-(III) oxide	$Fe_3O_4(s)$	-1120	-1015	146
Hydrogen atomic	$H(g)$	218.00	203.29	114.61
Hydrogen	$H_2(g)$	0	0	130.57
Nitric acid (ideal vapour state)	$HNO_3(g)$	-134	-74	267
Nitric acid	$HNO_3(l)$	-174	-81	156
Water (ideal vapour state)	$H_2O(g)$	-241.82	-228.59	188.72
Water	$H_2O(l)$	-285.83	-237.18	69.95
Hydrogen peroxide (ideal vapour state)	$H_2O_2(g)$	-136.31	-105.60	232.63
Hydrogen peroxide	$H_2O_2(l)$	-188	-120	110
Nitrogen atomic	$N(g)$	472.68	455.51	153.19
Nitrogen	$N_2(g)$	0	0	191.50
Nitrogen monoxide	$NO(g)$	90.25	86.57	210.65
Nitrogen dioxide	$NO_2(g)$	33.18	51.30	239.95
di-Nitrogen oxide	$N_2O(g)$	82.1	104.2	220
di-Nitrogen oxide (ideal liquid state)*	$N_2O(l)$	69.8	113	148.5
di-Nitrogen tetroxide	$N_2O_4(g)$	9.16	97.9	304.2
di-Nitrogen tetroxide (ideal liquid state)*	$N_2O_4(l)$	–19.6	97.4	209.2
Ammonia	$NH_3(g)$	-46.19	-16.59	192.33
Ammonia (ideal liquid state)*	$NH_3(l)$	-66.8	-11.2	104.8
Ammonium perchlorate (AP)	$NH_4ClO_4(s)$	-295	-89	184
Hydrazine (ideal vapour state)	$N_2H_4(g)$	95.4	159	238
Hydrazine	$N_2H_4(l)$	50.63	149.3	121.21
Monomethyl hydrazine (MMH)	$N_2H_3CH_3(l)$	54.14	180	166
Unsymmetrical dimethyl hydrazine (UDMH)	$N_2H_2(CH_3)_2(l)$	48.3	205	200
Oxygen atomic	$O(g)$	249.17	231.77	160.95
Oxygen	$O_2(g)$	0	0	205.04
Ozone	$O_3(g)$	142.4	162.9	238.80
Hydroxyl	$OH(g)$	39.46	34.28	183.75
Sulfur (rhombic)	$S(s)$	0	0	31.80
Sulfur dioxide	$SO_2(g)$	-296.83	-300.19	248.11
Sulfur trioxide	$SO_3(g)$	-395.8	-371.0	256.8

* Those substances are gases at 100 kPa and 25 ºC, but often used as compressed liquids.

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