

TABLE 14.3 Standard enthalpies of formation, ΔH_f° , for various substances at 25°C

Substance	Formula	$\Delta H_f^\circ/\text{kJ}\cdot\text{mol}^{-1}$	Substance	Formula	$\Delta H_f^\circ/\text{kJ}\cdot\text{mol}^{-1}$
aluminum oxide	$\text{Al}_2\text{O}_3(s)$	-1675.7	hydrogen fluoride	$\text{HF}(g)$	-273.3
ammonia	$\text{NH}_3(g)$	-45.9	hydrogen iodide	$\text{HI}(g)$	+26.5
benzene	$\text{C}_6\text{H}_6(l)$	+49.1	hydrogen peroxide	$\text{H}_2\text{O}_2(l)$	-187.8
benzoic acid	$\text{C}_6\text{H}_5\text{COOH}(s)$	-385.2	iodine vapor	$\text{I}_2(g)$	+62.4
bromine vapor	$\text{Br}_2(g)$	+30.9	magnesium carbonate	$\text{MgCO}_3(s)$	-1095.8
butane	$\text{C}_4\text{H}_{10}(g)$	-125.7	magnesium oxide	$\text{MgO}(s)$	-601.6
calcium carbonate	$\text{CaCO}_3(s)$	-1207.6	magnesium sulfide	$\text{MgS}(s)$	-346.0
carbon (diamond)	$\text{C}(s)$	+1.897	methane	$\text{CH}_4(g)$	-74.6
carbon (graphite)	$\text{C}(s)$	0	methanol (methyl alcohol)	$\text{CH}_3\text{OH}(l)$ $\text{CH}_3\text{OH}(g)$	-239.2 -201.0
carbon (buckminster fullerene)	$\text{C}_{60}(s)$	+2327.0	methyl chloride	$\text{CH}_3\text{Cl}(g)$	-81.9
carbon dioxide	$\text{CO}_2(g)$	-393.5	nitrogen dioxide	$\text{NO}_2(g)$	+33.2
carbon monoxide	$\text{CO}(g)$	-110.5	nitrogen oxide	$\text{NO}(g)$	+91.3
carbon tetrachloride	$\text{CCl}_4(l)$ $\text{CCl}_4(g)$	-128.2 -95.7	dinitrogen tetroxide	$\text{N}_2\text{O}_4(g)$ $\text{N}_2\text{O}_4(l)$	+11.1 -19.5
chromium(III) oxide	$\text{Cr}_2\text{O}_3(s)$	-1139.7	octane	$\text{C}_8\text{H}_{18}(l)$	-250.1
cyclohexane	$\text{C}_6\text{H}_{12}(l)$	-156.4	pentane	$\text{C}_5\text{H}_{12}(l)$	-173.5
ethane	$\text{C}_2\text{H}_6(g)$	-84.0	propane	$\text{C}_3\text{H}_8(g)$	-103.8
ethanol (ethyl alcohol)	$\text{CH}_3\text{CH}_2\text{OH}(l)$	-277.6	sodium carbonate	$\text{Na}_2\text{CO}_3(s)$	-1130.7
ethene (ethylene)	$\text{C}_2\text{H}_4(g)$	+52.4	sodium oxide	$\text{Na}_2\text{O}(s)$	-414.2
ethyne (acetylene)	$\text{C}_2\text{H}_2(g)$	+227.4	sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}(s)$	-2226.1
freon-12 (dichloro difluoromethane)	$\text{CF}_2\text{Cl}_2(g)$	-477.4	sulfur dioxide	$\text{SO}_2(g)$	-296.8
glucose	$\text{C}_6\text{H}_{12}\text{O}_6(s)$	-1273.3	sulfur trioxide	$\text{SO}_3(g)$	-395.7
hexane	$\text{C}_6\text{H}_{14}(l)$	-198.7	tin(IV) oxide	$\text{SnO}_2(s)$	-577.6
hydrazine	$\text{N}_2\text{H}_4(l)$ $\text{N}_2\text{H}_4(g)$	+50.6 +95.4	water	$\text{H}_2\text{O}(l)$ $\text{H}_2\text{O}(g)$	-285.8 -241.8
hydrogen bromide	$\text{HBr}(g)$	-36.3			
hydrogen chloride	$\text{HCl}(g)$	-92.3			

Data from *CRC Handbook of Chemistry and Physics*, 86th Ed., Ed. David R. Lide, CRC Press, 2005–2006. (More thermodynamic data are given in Appendix D.)