

Module 8: Thermochemistry
Topic 1 Content: Standard Enthalpy of Formation for Various Compounds Table

Standard Enthalpy of Formation for Various Compounds							
Compound	ΔH°_f (kJ/mol)	Compound	ΔH°_f (kJ/mol)	Compound	ΔH°_f (kJ/mol)	Compound	ΔH°_f (kJ/mol)
Ag ₂ O(s)	-30.6	C ₂ H ₅ OH(l)	-277.6	HCl(g)	-92.3	NH ₄ Cl(s)	-315.4
Ag ₂ S(s)	-31.8	C ₂ H ₆ (g)	-84.7	HF(g)	-268.6	NH ₄ NO ₃ (s)	-365.1
AgBr(s)	-99.5	C ₃ H ₈ (g)	-103.8	HgO(s)	-90.7	NiO(s)	-244.3
AgCl(s)	-127.0	n-C ₄ H ₁₀ (g)	-124.7	HgS(s)	-58.2	NO(g)	+90.4
AgI(s)	-62.4	n-C ₅ H ₁₂ (l)	-173.1	HI(g)	+25.9	NO ₂ (g)	+33.9
Al ₂ O ₃ (s)	-1669.8	CO(g)	-110.5	HNO ₃ (l)	-173.2	Pb ₃ O ₄ (s)	-734.7
BaCl ₂ (s)	-860.1	CO ₂ (g)	-393.5	KBr(s)	-392.2	PbBr ₂ (s)	-277.0
BaCO ₃ (s)	-1218.8	CoO(s)	-239.3	KCl(s)	-435.9	PbCl ₂ (s)	-359.2
BaO(s)	-558.1	Cr ₂ O ₃ (s)	-1128.4	KClO ₃ (s)	-391.4	PbO(s)	-217.9
BaSO ₄ (s)	-1465.2	Cu ₂ O(s)	-166.7	KF(s)	-562.6	PbO ₂ (s)	-276.6
Ca(OH) ₂ (s)	-986.6	CuO(s)	-155.2	Mg(OH) ₂ (s)	-924.7	PCl ₃ (g)	-306.4
CaCl ₂ (s)	-795.0	CuS(s)	-48.5	MgCl ₂ (s)	-641.8	PCl ₅ (g)	-398.9
CaCO ₃ (s)	-1207.0	CuSO ₄ (s)	-769.9	MgCO ₃ (s)	-1113	SiO ₂ (s)	-859.4
CaO(s)	-635.5	Fe ₂ O ₃ (s)	-822.2	MgO(s)	-601.8	SnCl ₂ (s)	-349.8
CaSO ₄ (s)	-1432.7	Fe ₃ O ₄ (s)	-1120.9	MgSO ₄ (s)	-1278.2	SnCl ₄ (l)	-545.2
CCl ₄ (l)	-139.5	H ₂ O(g)	-241.8	MnO(s)	-384.9	SnO(s)	-286.2
CH ₃ OH(l)	-238.6	H ₂ O(l)	-285.8	MnO ₂ (s)	-519.7	SnO ₂ (s)	-580.7
CH ₄ (g)	-74.8	H ₂ O ₂ (l)	-187.6	NaCl(s)	-411.0	SO ₂ (g)	-296.1
CHCl ₃ (l)	-131.8	H ₂ S(g)	-20.1	NaF(s)	-569.0	SO ₃ (g)	-395.2

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$\text{C}_2\text{H}_2(\text{g})$	+226.7	$\text{H}_2\text{SO}_4(\text{l})$	-811.3	$\text{NaOH}(\text{s})$	-426.7	$\text{ZnO}(\text{s})$	-348.0
$\text{C}_2\text{H}_4(\text{g})$	+52.3	$\text{HBr}(\text{g})$	-36.2	$\text{NH}_3(\text{g})$	-46.2	$\text{ZnS}(\text{s})$	-202.9

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Standard Enthalpy of Formation for Atomic and Molecular Ions							
Cations		Cations		Anions		Anions	
	ΔH°_f (kJ/mol)		ΔH°_f (kJ/mol)		ΔH°_f (kJ/mol)		ΔH°_f (kJ/mol)
Ag ⁺ (aq)	+105.9	K ⁺ (aq)	-251.2	Br ⁻ (aq)	-120.9	H ₂ PO ₄ ⁻ (aq)	-1302.5
Al ³⁺ (aq)	-524.7	Li ⁺ (aq)	-278.5	Cl ⁻ (aq)	-167.4	HPO ₄ ²⁻ (aq)	-1298.7
Ba ²⁺ (aq)	-538.4	Mg ²⁺ (aq)	-462.0	ClO ₃ ⁻ (aq)	-98.3	I ⁻ (aq)	-55.9
Ca ²⁺ (aq)	-543.0	Mn ²⁺ (aq)	-218.8	ClO ₄ ⁻ (aq)	-131.4	MnO ₄ ⁻ (aq)	-518.4
Cd ²⁺ (aq)	-72.4	Na ⁺ (aq)	-239.7	CO ₃ ²⁻ (aq)	-676.3	NO ₃ ⁻ (aq)	-206.6
Cu ²⁺ (aq)	+64.4	NH ₄ ⁺ (aq)	-132.8	CrO ₄ ²⁻ (aq)	-863.2	OH ⁻ (aq)	-229.9
Fe ²⁺ (aq)	-87.9	Ni ²⁺ (aq)	-64.0	F ⁻ (aq)	-329.1	PO ₄ ³⁻ (aq)	-1284.1
Fe ³⁺ (aq)	-47.7	Pb ²⁺ (aq)	+1.6	HCO ₃ ⁻ (aq)	-691.1	S ²⁻ (aq)	+41.8
H ⁺ (aq)	0.0	Sn ²⁺ (aq)	-10.0			SO ₄ ²⁻ (aq)	-907.5
		Zn ²⁺ (aq)	-152.4				

* All standard enthalpy values are at 25°C, 1 molar concentration, and 1 atmosphere of pressure.