Types of Enthalpy Change

heat of reaction(ΔH_{rxn}): enthalpy change for a chemical reaction

$2Al(s) + Fe_2O_3(s) \rightarrow Al_2O_3(s) + 2Fe(s)$ $\Delta H = \Delta H_{rxn} = -851$ kJ

heat of combustion (ΔH_{comb}): enthalpy change for the chemical reaction when 1 mol of a substance reacts with O_2 (combustion)

$C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$ $\Delta H = \Delta H_{comb} = -108$ kJ

heat of formation (ΔH_f): enthalpy change for the chemical reaction when 1 mol of a compound is produced from its component elements

$Na(s) + \frac{1}{2}Cl_2(g) \rightarrow NaCl(s)$ $\Delta H = \Delta H_f = -411.1$ kJ

heat of fusion (ΔH_{fus}): enthalpy change for the melting (or freezing) of 1 mol of a substance

$C_2H_6O(s) \rightarrow C_2H_6O(l)$ $\Delta H = \Delta H_{fus} = +5.0$ kJ

[ΔH_{fus}(melting) = +5.0 kJ ; ΔH_{fus}(freezing) = -5.0 kJ]

heat of vaporization (ΔH_{vap}): enthalpy change for the vaporization (or condensation) of 1 mol of a substance

$H_2O(l) \rightarrow H_2O(g)$ $\Delta H = \Delta H_{vap} = +40.7$ kJ

[ΔH_{vap}(vaporization) = +40.7 kJ ; ΔH_{vap}(condensation) = -40.7 kJ]

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exothermic: heat released in process (heat is a "product"; ΔH negative)
endothermic: heat absorbed in process (heat is a "reactant"; ΔH positive)