Chap 17 - Thermochemistry

- endo, exothermic
- heat capacity $\Delta H = cm\Delta T$
- thermochemical Equations

$A + B + 62kJ \rightarrow C + D$

$A + B \rightarrow C + D \; ; \Delta H = 62\,kJ$

- Hess' Law of Heat of Formation

$$\Delta H_f^0 = \Delta H_f^0(\text{products}) - \Delta H_f^0(\text{reactants})$$

EXAMPLE 1

$2Al(s) + Fe_2O_3(s) \rightarrow 2Fe(s) + Al_2O_3$

$\Delta H = ?$

Given

$2Al(s) + \frac{3}{2}O_2(g) \rightarrow Al_2O_3(s) \; ; \Delta H = -1669.8\,kJ$

$2Fe(s) + \frac{3}{2}O_2(g) \rightarrow Fe_2O_3(s) \; ; \Delta H = -824.2\,kJ$

Example 2

What is standard heat of reaction for the decomposition of hydrogen peroxide

$2H_2O_2(l) \rightarrow 2H_2O(l) + O_2(g)$ $\quad \Delta H_f^0$

$\Delta H_f^0 = \Delta H_f^0(\text{products}) - \Delta H_f^0(\text{reactants})$

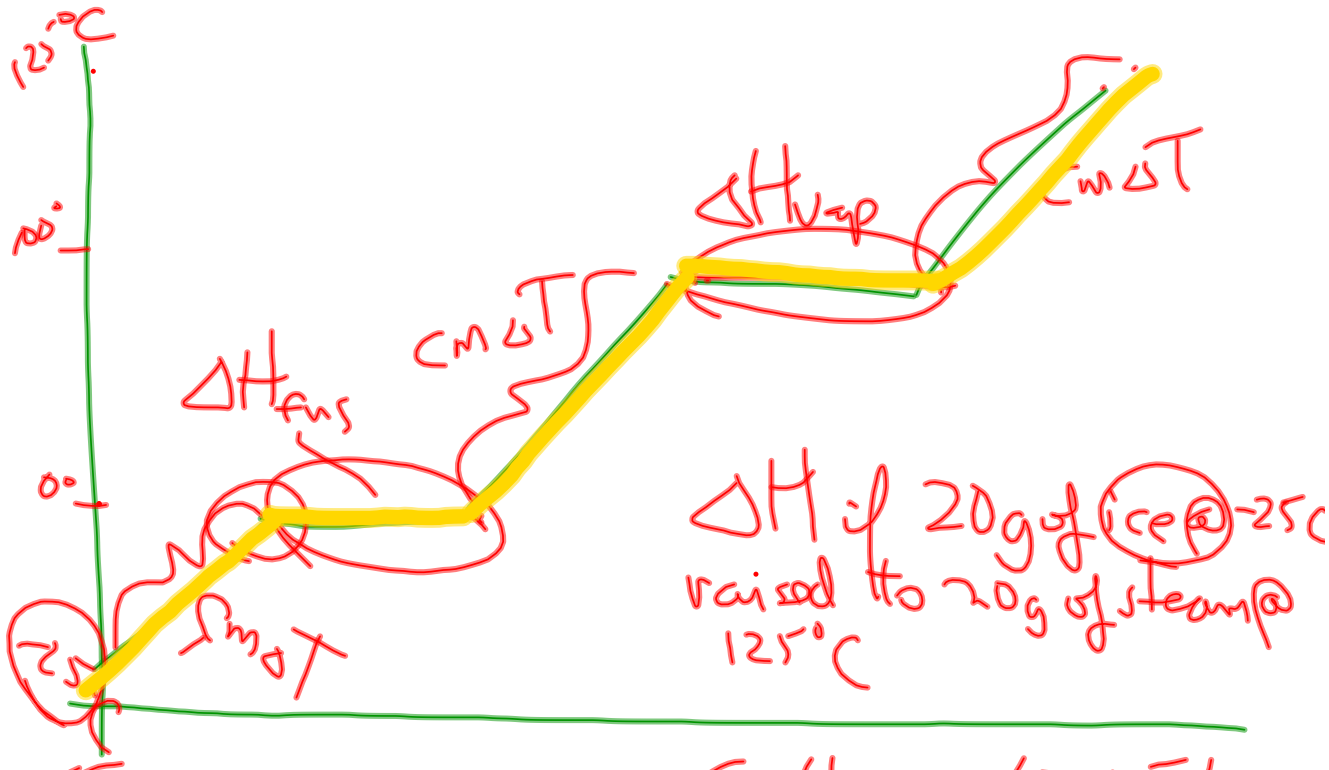
$2\left(-285.8\,kJ/mol\right) - \left(-187.8\,kJ/mol\right)$

Enthalpy & phase change

- ΔH_{vap}, ΔH_{fus}, ΔH_{solid}, ΔH_{cond}

  KJ/mole 27g → x moles

Chem 122-Chapter 17 Summary



$C_{ice} = 2.2\ J/g \cdot °C$

$C_{water} = 4.18\ J/g \cdot °C$

$C_{steam} = 1.99\ J/g \cdot °C$

$\Delta H_{fus} = 6.01\ kJ/mol$

$\Delta H_{vap} = 40.7\ kJ/mol$