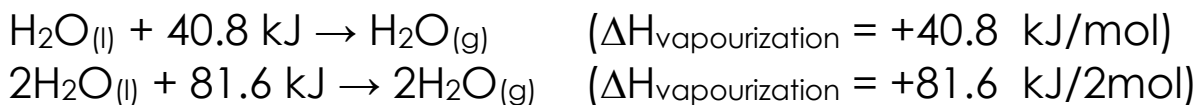


5.2 Molar Enthalpies

Homework Practice 1,2,3,4,5,7,9
Questions 1,2,3,4,5

- Molar enthalpy (ΔH_x): the enthalpy change associated with a physical, chemical, or nuclear change involving one mole of a substance.
- E.g. $1\text{H}_{2(g)} + \frac{1}{2}\text{O}_{2(g)} \rightarrow 1\text{H}_2\text{O}_{(g)} + 241.8 \text{ kJ}$
 - 1 mole of H_2 will consume $\frac{1}{2}$ mole of O_2 and will produce 1 mole water vapour and 241.8 kJ of energy will be liberated (exothermic)
 - $\Delta H_{\text{combustion}} = -241.8 \text{ kJ/mol}$
- Exothermic: ΔH is negative (thermal energy leaving the system)
- Endothermic: ΔH is positive (thermal energy entering the system)
- Calculating enthalpy for a change of state:



- Use the formula: $\Delta H = n\Delta H_x$ (x = types of changes p306)

enthalpy change = moles x molar enthalpy of the change

- Enthalpy change expressed in KJ
- See sample question on p.307

Calorimetry of Physical Change

- Usually done in an isolated system (no movement of matter or energy in or out of the system)
- Assumptions:
 - No heat is transferred between the calorimeter and the outside environment.
 - Any heat absorbed or released by the calorimeter material, such as the container, is negligible. Assuming that the material is an insulator, otherwise they must be taken into account.
 - A dilute aqueous solution is assumed to have a density and specific heat capacity equal to that of pure water (1.00 g/mL and 4.18 J/g · °C or 4.18 kJ/kg · °C)
- See sample problem on p.309

Calorimetry of Chemical Change

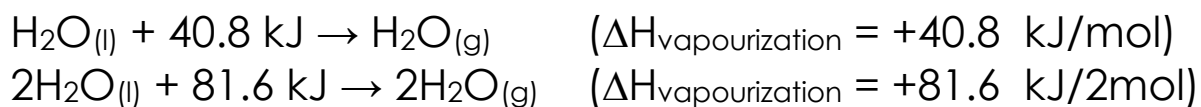
- Usually done with dilute aqueous solutions and calculations are similar to the change of state calculations.
- There are many different ways that chemists describe situations
 - Ex. Molar enthalpy = heat of = enthalpy of
- Convert gram values into moles [m/M or c x v]

Formula: $nH_x = mc\Delta T$

nH_x is referring to the chemical in question

$mc\Delta T$ is referring to the water or total solution

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