Definitions and Concepts for Edexcel Chemistry A-level

Topic 8: Energetics 1

Enthalpy change: Heat energy change in a reaction at constant pressure ($kJmol^{-1}$).

Standard conditions: 100 kPa, 298 K, 1 $moldm^{-3}$ concentrations of ions.

Exothermic: Heat given off; −ve value of enthalpy change.

Endothermic: Heat absorbed; +ve value of enthalpy change.

Standard enthalpy change of reaction: Enthalpy change when reaction occurs in the molar quantities shown in the chemical equation under standard conditions.

Standard enthalpy change of formation: Enthalpy change when 1 mole of a compound is formed from its elements in their standard states under standard conditions.

Standard enthalpy of combustion: Enthalpy change when 1 mole of a substance is completely burned in oxygen under standard conditions.

Standard enthalpy of neutralisation: Enthalpy change when an acid and alkali react together under standard conditions to form 1 mole of water.

Equation for calorimetry calculations: heat change $\mathbf{Q = mC\Delta T}$, where m = mass, C = specific heat capacity, ΔT = change in temperature.

Specific heat capacity: The amount of energy needed to raise a temperature of 1 g of a substance by 1 degree.

Hess's law: The total enthalpy change is independent of the reaction pathway taken.

Bond Enthalpy: Amount of energy required to break 1 mole of the stated bond in the gas phase.

In terms of bond enthalpies:

Enthalpy Change of reaction = Sum of bond enthalpies of reactants – Sum of bond enthalpies of products.

Mean bond enthalpy: average amount of energy needed to break a specific type of bond, measured over a variety of different molecules.