Definitions

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| **What is enthalpy?** | The stored energy in a chemical system. |
| **What are the standard conditions?** | * 1 atmosphere (101 kPa) * 298 K (25 °C) * 1 moldm-3 |
| **How does an enthalpy definition change when "standard" is added before it?** | Add "and under standard conditions" to the end |
| **What is the ‘enthalpy change of reaction’ (ΔrH°) defined as?** | Enthalpy change of a reaction in the **molar quantities expressed by the balanced chemical equation** with all substances in their standard conditions. |
| **What is ‘enthalpy change of formation’ (ΔfH°)?** | * Enthalpy change when **one mole** of a substance is formed from its constituent elements with all substances in their standard states. * 2 Na (s) + ½ O2 (g) → Na2O (s)   *For an element, this is zero.* |
| **What is enthalpy change of combustion’ (ΔcH°)?** | * Enthalpy change when **one mole** of a substance undergoes complete combustion in oxygen with all substances in standard states. * H2 (g) + ½ O2 (g) → H2O (g) |
| **What is ‘ionisation enthalpy’ (ΔieH°)?** | * Enthalpy change when each atom/ion in **one mole of gaseous** atoms/ions loses one electron to form **one mole of gaseous** ions. * Mg (g) → Mg+ (g) + e- **OR** Mg+ (g) → Mg2+ (g) + e-   *Must be specific in the number of the charges when asked for something such as "define the second electron affinity".* |
| **What is ‘enthalpy of neutralisation’ (ΔneutH°)?** | Enthalpy change when **one mole** of water is formed in a reaction between an acid and alkali in their standard states. |
| **What is 'electron affinity' (ΔeaH°)? (with equation)** | * Enthalpy change when each atom/ion in **one mole of gaseous** atoms/ions gains one electron to form o**ne mole of gaseous** ions. * Mg (g) + e-  → Mg- (g) **OR** Mg- (g) + e-  → Mg2- (g)   *Must be specific in the number of the charges when asked for something such as "define the second electron affinity".* |
| **What is ‘standard enthalpy of atomisation’ (ΔatH°)?** | * Enthalpy change when **one mole of gaseous atoms** is formed from its elements under standard state. * ½ I2 (s) → I (g)   *Must be specific in the number of negative charges.* |
| **What is ‘hydration enthalpy’ (ΔhydH)?** | * Enthalpy change when **one mole of gaseous** ions become hydrated (dissolved in water). * Mg2+ (g) + H2O → Mg2+ (aq) |
| **What is ‘enthalpy of solution’ (ΔsolH)?** | * Enthalpy change when **one mole of an ionic solid** dissolves in an excess of water to ensure that the dissolved ions are well separated and do not interact with one another. * MgCl2 (s) + H2O → Mg2+ (aq) + 2Cl- (aq)   *This involves breaking up the bonds and forming new bonds between the metal ions and water molecules.* |
| **What is ‘bond dissociation enthalpy’ (ΔdeH)? (with an equation)** | * Enthalpy change when **one mole of covalent bonds** is **broken** in the **gaseous state**. * I2 (g) → 2 I (g) |
| **What is ‘lattice enthalpy of formation’ (ΔlefH)? (with example)** | * Enthalpy change when **one mole of an ionic solid** is **formed** from its constituent ions in the **gas phase**. * Mg2+ (g) + 2Cl- (g) → MgCl2 (s) |
| **What is ‘lattice enthalpy of dissociation’ (ΔledH)? (with equation)** | * Enthalpy change when **one mole of an ionic solid** is broken up into its constituent ions in the **gas phase**. * MgCl2 (s) → Mg2+ (g) + 2Cl- (g) |

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