AQA GCSE Chemistry

Topic 3: Quantitative chemistry

Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations

Notes

(Content in bold is for Higher Tier only)

Conservation of mass and balanced chemical equations

- Law of conservation of mass: no atoms are lost or made during a chemical reaction so the mass of the products = mass of the reactants
    - this means that in a chemical equation, it is balanced in terms of the numbers of atoms of each element involved on both sides of the equation- there must be exactly the same number on each side

Relative formula mass

- Relative formula mass (Mr) of a compound: sum of the relative atomic masses of the atoms in the numbers shown in the formula
    - e.g. for HCl: Mr= 1 + 35.5 = 36.5
- In a balanced chemical equation:
  sum of Mr of reactants in quantities shown = sum of Mr of products in quantities shown
  (essentially no mass is lost during a reaction)

Mass changes when a reactant or product is a gas

- If a reaction appears to involve a change in mass – check to see if this is due to a reactant or a product as a gas and its mass has not been taken into account (e.g. because the gas has been released into the atmosphere)
    - Example: when a metal reacts with oxygen: mass of metal oxide product > mass of metal

Chemical measurements

- Whenever a measurement is made there is always some *uncertainty* about the result obtained
    - Therefore, be prepared to make estimations of uncertainty