Definitions and Concepts for WJEC (Wales) Chemistry GCSE

Topic 1.1 - The Nature of Substances and Chemical Reactions

---

*Definitions in **bold** are for higher tier only*

Definitions have been taken, or modified from the WJEC (Wales) Specification for GCSE Chemistry, 3410, Version 2 March 2019

Avogadro's constant: The number of atoms, molecules or ions in one mole of a given substance.

Chemical reaction: A process in which the atoms in the reactants rearrange to form one or more products which must have the same total number of each type of atom as the reactants.

Chromatography: A process used to separate substances in a mixture. Separation of the substance depends on distribution between a mobile phase and a stationary phase.

Compound: A substance made up of two or more types of atoms chemically combined together.

Effervescence: The bubbles formed in a liquid, causing fizzing. Often evidence that a chemical reaction has taken place.

Element: A substance made up of only one type of atom which can not be broken down into simpler substances by chemical means.

Evaporation: A separation technique to separate soluble solids from solutions. The solution is slowly heated in an evaporating dish so that the solvent evaporates to leave the dry crystals.

Filtration: A separation technique used to separate an insoluble solid from a solution.

Fractional distillation: A process used to separate a mixture of liquids. The liquids have different boiling points so can be separated into different fractions within a fractionating column.

Mixture: Contains at least two different elements or compounds which are not chemically bonded together. Mixtures may melt or boil over a range of temperatures.

Mobile phase: The fluid (gas or liquid) which moves through the chromatography system, carrying the mixture which is to be separated.

Mole: **The unit for amount of substance. The symbol for the unit mole is mol.**

Paper chromatography: A type of chromatography which uses paper as the stationary phase and a solvent as the mobile phase. The solvent carries the mixture up the paper where the substances in the mixture then separate, depending on how soluble they are in the mobile phase.

Percentage yield: The percentage ratio of the actual yield of product from a reaction compared with the theoretical yield.

$$\text{Percentage yield} = \frac{\textit{Actual yield}}{\textit{Theoretical Yield}} \times 100$$

Relative atomic mass: An average value that takes into account the abundances of the isotopes of the element. The relative atomic mass is the average mass of an atom of an element compared to 1/12th the mass of an atom of carbon-12.

Relative formula mass: The sum of the relative atomic masses of the atoms in the numbers shown in the formula. It is numerically equal to the mass of one mole of a substance in grams. It is called the relative molecular mass when referring to covalent molecules and the relative formula mass when referring to ionic compounds.

Rf value: A value used in chromatography which is calculated as the distance travelled by the dissolved substance divided by the distance travelled by the solvent. It can be used to identify substances within a mixture.

Simple distillation: A separation technique used to separate a liquid from a solution. The solution is heated so that only the liquid with the lowest boiling point evaporates. This gas is then condensed in a condenser before being collected as a liquid.

Stationary phase: The nonmoving phase which the mobile phase passes over during chromatography.

Theoretical yield: The maximum possible mass of product that can be obtained from a reaction.