

IGCSE Chemistry: Amount of Substance

Whole Unit Overview

(Please note: (S) denotes material in the Supplement (Extended syllabus) only)

Learning Outcomes		Suggested Teaching Activities	Resources
4	Use the symbols of the elements and write formulae of simple compounds.		
4	Deduce the formula of a simple compound from the relative numbers of atoms present	This should be linked with organic molecules and with inorganic substances such as P_4O_{10} .	
4 (S)	Determine the formula of an ionic compound from the charges on the ions present.	The charges on ions should be linked with the group number of the element in the Periodic table.	Notes on formula writing: http://www.rjclarkson.demon.co.uk/junior/
4	Deduce the formula of a simple compound from a model or a diagrammatic representation.	This can be linked with organic molecules but also include examples from suitable pictures of ionic giant structures. Students need to be able to use both molecular and full structural formulae.	
4	Construct word equations and simple balanced chemical equations.		
4 (S)	Construct equations with state symbols, including ionic equations.	This should be linked to all theoretical and experimental work during the course.	

IGCSE Chemistry 0620 Scheme of Work

4 (S)	Deduce the balanced equation for a chemical reaction, given relevant information.	The information should be masses or amounts of material that react together.	
4	Define relative atomic mass, A_r .		
4	Define relative molecular mass, M_r , as the sum of the relative atomic masses (relative formula mass or M_r will be used for ionic compounds) (Calculations involving reacting masses may be set involving simple proportions. For <u>core</u> Candidates, calculations will <i>not</i> involve the mole concept).		
4.1 (S)	Define the mole and the Avogadro constant.	Emphasize the idea of a mole being a particular number of specified particles.	http://www.liv.ac.uk/chemistry/links/constants.html
4.1 (S)	Use the molar gas volume, taken as 24 dm^3 at room temperature and pressure.	An experiment reacting magnesium with dilute sulphuric acid can be used to find/use the molar gas volume.	

IGCSE Chemistry 0620 Scheme of Work

4.1 (S)	<p>Calculate stoichiometric reacting masses and volumes of gases and solutions, solution concentrations expressed in g/dm^3 and mol/dm^3. (Calculations involving the idea of limiting reactants may be set. Questions on the gas laws and the conversion of gaseous volumes to different temperatures and pressures will <i>not</i> be set.)</p>	<p>This can be linked back to the preparation of salts by titration e.g. preparation of sodium chloride.</p> <p>Students should also be competent at handling reactant mass data given in tonnes for industrial scale reactions e.g. preparation of salts for use as fertilisers.</p>	<p>Hints for basic amount calculations: http://science.widener.edu/svb/pset/stoichio.html</p>
4.1 (S)	<p>Calculate empirical formulae and molecular formulae.</p>	<p>Suggested experiment: heating a coil of magnesium ribbon to complete oxidation in a crucible. This gives appropriate data if an accurate digital balance is available.</p>	<p>Worked examples see in: http://www.rjclarkson.demon.co.uk/</p>
4.1 (S)	<p>Calculate % yield and % purity.</p>	<p>% yield can be calculated by analysing the results for simple displacement reactions. % purity can be calculated by using titration techniques to estimate, for example, the amount of iodine in a known mass of potassium iodate.</p>	<p>Worked examples see in: http://www.rjclarkson.demon.co.uk/</p>