

DRAFT CHANGES IN CONTENT FOR GCSE CHEMISTRY MARCH 2017

Section and Notes	Content removed	Content moved	Content added/clarified
(1.1) has been removed	Separation of iron and sulfur (1.1.4)	Element (1.1.1 & 1.1.2) → 1.6.3	
and redistributed to 1.6 and 1.9	Mass spectrometry (1.1.10)	Compound (1.1.3) → 1.1.13	
	HPLC (1.1.10)	Mixtures & separation (1.1) → 1.9	
		Classifying elements (1.1.9) → 1.6.5	
1.1 Atomic Structure			Atomic and nuclear radius 1.1.9
1.2 Bonding			Covalent bond as a line 1.2.11
1.3 Structures		Ionic soluble (1.10.4) → 1.3.2	Alloy structure 1.3.9
		Molecular covalent insoluble (1.10.4) → 1.3.5	Gold carats 1.3.10
			Carbon 4 bonds 1.3.11
			Graphene 1.3.12
1.4 Nanoparticles		Moved from (2.8)	SA to volume ratio 1.4.2 & 1.4.3
			Benefits and risks 1.4.4
1.5 Symbols, formulae & equations			Half equations 1.5.9
			State symbols 1.5.10
1.6 Periodic Table	Newlands (1.6.1)	Changes of state 1.6.7 → 1.9	Explaining reactivity trend in Group 1 1.6.14
		Element (1.1.1 & 1.1.2) → 1.6.3	Test for chlorine 1.6.18
		Colour of Group 1 compounds (1.8.18) → 1.6.15	Explaining reactivity trend in Group 7 1.6.20
		Colours of transition metal (mostly copper(II) compounds (1.8.17) → 1.6.27	Noble gases colourless 1.6.24 and bp trend (1.6.25)

Section and Notes	Content removed	Content moved	Content added/clarified
			Transition metals comparison with Group 1 (mp, density & reactivity) 1.6.26
1.7 Quantitative chemistry A <sub>r</sub> and M <sub>r</sub> in place of RAM and RFM	Evaluate methods of data collection for empirical formula determination (1.7.15)	% of an element in a compound (2.7.1) → 1.7.2	Limiting reactant 1.7.6
1.8 Acids, bases and salts	Validity & reliability (1.8.4)	Methyl orange (2.7.6) → 1.8.1	[H <sup>+</sup> ] related to pH 1.8.5 Dilute vs concentrated 1.8.9 Salt definition 1.8.16
1.9 Chemical analysis	Validity and reliability (1.9.3)	Solvent, solute, solution (1.10.5) → 1.9.4 Hydrated and anhydrous (1.10.5) → 1.7.9 CuSO <sub>4</sub> test for water (2.2.2) → 1.9.11 Test for metal ion using NH <sub>3</sub> (aq) (2.5.17) → 1.9.14	Pure substance 1.9.1 Mp and bp as measure of purity 1.9.2 Formulation 1.9.3 Mobile phase and stationary phase 1.9.6 R <sub>f</sub> values 1.9.7 Potable water 1.9.9 Seawater distillation 1.9.10
1.10 Solubility	General solubility rules (1.10.2) Thermal pollution (1.10.11)	Solvent, solute, solution (1.10.5) → 1.9.4 Hydrated and anhydrous (1.10.5) → 1.7.9	

Section and Notes	Content removed	Content moved	Content added/clarified
2.1 Reactivity Series of metals		Link to method of extraction (2.8.5) → 2.1.6	Metal tendency to form positive ion link to reactivity 2.1.3
			Phytomining 2.1.7 & 2.1.8
(2.2) Water	(2.2.1) – (2.2.14) removed Physical properties of water Hard and soft water Drying agents Fluoridation Barium sulfate	CuSO <sub>4</sub> test for water (2.2.2) → 1.9.11	
2.2 Redox, rusting & iron	Reduction of copper(II) oxide using hydrogen (2.3.20)	Oxidation and reduction in terms of oxygen and hydrogen (2.3.18) and (2.3.19) combined and amended → 2.2.1	
		Reactions of Mg and S with air included in 2.1 and 2.9 (2.3.20)	
		Oxidation and reduction in terms of electrons (2.3.21) → 2.2.2	
		Link to suitable industrial process (2.3.22) → 2.2.2	
		Rusting (2.3.17 & 2.3.18) → 2.2.3 & 2.2.4	
		Extraction of iron (2.8.14) → 2.2.5	
		Iron uses (1.4.9) → 2.2.6	
(2.3) Chemical change	Recognising chemical change (2.3.1)	Composition of gases in air (2.3.11) → 2.9.1	
	Thermal decomposition (2.3.4 – 2.3.7)		
	The atmosphere (2.3.8 – 2.3.9)		

Section and Notes	Content removed	Content moved	Content added/clarified
	The Earth's surface (2.3.13 – 2.1.15)		
2.3 Rates of reaction	Validity and reliability (2.4.6)	Qualitative effects of rate (2.4.1) → 2.3.4	Sodium thiosulfate with acid 2.3.2
This section has been simplified in terms of layout – statements subsumed into 2.3.4	Better catalysts (2.4.8)	Explanation of changes in rate (2.4.5 & 2.4.7) → 2.3.4	
			Catalyst providing an alternative reaction pathway of lower activation energy 2.3.6
2.4 Equilibrium		Haber process compromise temperature (2.5.18 & 2.5.19) → 2.4.4	Reversible reactions 2.4.1 Dynamic equilibrium 2.4.2 Le Châtelier's principle 2.4.3
(2.5) Non-metals	O <sub>2</sub> use in rocket engines (2.5.22)	Gas tests (2.5.1) → 2.9	
A substantial section of this unit has been removed	2.5.16 Eutrophication	Preparation and properties of H <sub>2</sub> , CO <sub>2</sub> and O <sub>2</sub> (2.5.2 – 2.5.5; 2.5.7 – 2.5.9; 2.5.20 – 2.5.22) → 2.9	
	Ammonia properties(2.5.12)	Nitrogen lack of reactivity (2.5.10) → 2.9.2	
	Sulfur and sulfur dioxide (2.5.23 – 2.5.24); Note: reaction of sulfur with oxygen in 2.9 and reaction of SO <sub>2</sub> with H <sub>2</sub> O in acid rain formation expected in 2.5.28	Uses of nitrogen (2.5.11) → 2.9.3	
	Preventing acid rain (2.5.26)	Ammonia reacting with acids forming fertilisers (2.5.15) → 2.9.4	
	Sulfuric acid and contact process (2.5.27 – 2.5.31)	Ammonia solution testing for metal ions (2.5.17) → 1.9.14	

Section and Notes	Content removed	Content moved	Content added/clarified
		Haber process and compromise temperature (2.5.18 & 2.5.19) → 2.4.4	
		Sulfur dioxide reaction with water (2.5.24) and acid rain (2.5.25) → 2.5.28	
2.5 Organic chemistry	Renewable and non-renewable (2.6.1)	Toxicity of CO (2.5.6) → 2.5.11	Fuel oil fraction 2.5.7
	Oil spillage (2.6.4)		Cracking 2.5.8
	Naphtha fraction (2.6.5)		But-1-ene and but-2-ene 2.5.12
	Ethanol in alcoholic drinks (2.6.19)		Reaction of ethene with hydrogen 2.5.15
	Fractional distillation to make ethanol solution more concentrated (2.6.21)		Propan-1-ol and propan-2-ol 2.5.21
	Alcohol effects and breathalyser test (2.6.22)		Propanoic acid and butanoic acid 2.5.25
	Vinegar (2.6.27)		Combustion of fuels and greenhouse effect 2.5.28
2.6 Quantitative chemistry		% of an element in a compound (2.7.1) → 1.7.2	Determine degree of hydration from titrations 2.6.6
			Molar volume of gas 2.6.7
			Avogadro's Law 2.6.8
			Gas volume calculations 2.6.9
			Atom economies 2.6.10 & 2.6.11
2.7 Electrochemistry	Factor affecting siting aluminium extraction site (2.8.13)	This content was moved from 2.8 Electrolysis and extraction of	Electrolysis of H <sub>2</sub> SO <sub>4</sub> 2.7.4

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		aluminium	
(2.8) Materials	Natural and synthetic (2.8.1)	Nanomaterials (2.8.3 – 2.8.4) → 1.4	
	Factor affecting siting aluminium extraction site (2.8.13)	Link to method of extraction (2.8.5) → 2.1.6	
		Electrolysis (2.8.7 – 2.8.12) → 2.7	
		Extraction of iron (2.8.14) → 2.2.5	
2.8 Energy changes in chemistry		Exothermic and endothermic (2.3.2) → 2.8.1	Enthalpy profile diagrams 2.8.2
		Bond breaking and bond making (2.3.3) → 2.8.4	Activation energy defined 2.8.3
			Bond energy calculations 2.8.5
2.9 Gas chemistry		Composition of gases in air (2.3.11) → 2.9.1	
		Gas tests (2.5.1) → 2.9	
		Preparation and properties of H <sub>2</sub> , CO <sub>2</sub> and O <sub>2</sub> (2.5.2 – 2.5.5; 2.5.7 – 2.5.9; 2.5.20 – 2.5.22) → 2.9	
		Nitrogen lack of reactivity (2.5.10) → 2.9.2	
		Uses of nitrogen (2.5.11) → 2.9.3	
		Ammonia reacting with acids forming fertilisers (2.5.15) → 2.9.4	
		Ammonia solution testing for metal ions (2.5.17) → 1.9.14	