

# Summer 2022 Triple Chemistry Higher

Paper 1			
			Revision pages
<b>Topic 1</b> <b>Atomic structure and the periodic table</b>	<b>Major Focus 4.1.2 The periodic table</b>	<ul style="list-style-type: none"> <li>• Electron arrangement and position in the periodic table</li> <li>• Development of the periodic table</li> <li>• Metals and non-metals</li> <li>• Group 0</li> <li>• Group 1</li> <li>• Group 7</li> </ul>	Pages 34 - 35 37-46
	<b>Foundations of chemistry</b>	<ul style="list-style-type: none"> <li>• Atoms, elements and compounds</li> <li>• Atomic structure</li> <li>• History of the atom</li> <li>• Development of the atom</li> <li>• Electronic structure</li> </ul>	Pages 31-36
<b>Topic 2</b> <b>Bonding, structure and the properties of matter</b>	<b>Major Focus 4.2.1 Chemical bonds</b>	<ul style="list-style-type: none"> <li>• Ionic bonding</li> <li>• Ionic compounds</li> <li>• Covalent bonding</li> <li>• Metallic bonding</li> <li>• Limitations of models</li> </ul>	Pages 47-56, 61
	<b>Major focus 4.2.2 How bonding and structure are related to the properties of substances</b>	<ul style="list-style-type: none"> <li>• States of matter</li> <li>• State symbols</li> <li>• Properties of ionic compounds</li> <li>• Properties of small molecules</li> <li>• Polymers</li> <li>• Giant covalent structures</li> <li>• Properties of alloys</li> <li>• Metals as conductors</li> </ul>	Pages 50 57 60 63-65
	<b>Major focus 4.2.3 Structure and bonding of carbon</b>	<ul style="list-style-type: none"> <li>• Diamond</li> <li>• Graphite</li> <li>• Graphene and fullerenes</li> </ul>	Pages 58 - 59

<b>Topic 3</b> <b>Quantitative chemistry</b>	<b>Major Focus</b> <b>4.3.2 Use of amount of substances in relation to masses of pure substances</b>	<ul style="list-style-type: none"> <li>• Moles</li> <li>• Amounts of substances in equations</li> <li>• Using moles to balance equations</li> <li>• Limiting reactants</li> <li>• Concentration of solutions</li> </ul>	Pages 71 – 76 79-80
<b>Topic 4</b> <b>Chemical change</b>	<b>Major focus</b> <b>4.4.1 Reactivity of metals</b>	<ul style="list-style-type: none"> <li>• Metal oxides</li> <li>• Reactivity series</li> <li>• Extraction of metals and reduction</li> <li>• Oxidation and reduction in terms of electrons</li> </ul>	<b>Pages 96 -98</b>
	<b>Major focus</b> <b>4.4.2 Reactions of metals</b>	<ul style="list-style-type: none"> <li>• Reactions of acids with water</li> <li>• Neutralisation of acids and salt production</li> <li>• Soluble salts</li> <li>• pH scale and neutralisation</li> <li>• Titrations</li> <li>• Strong and weak acids</li> </ul>	<b>Pages 94 – 96</b> <b>87 -92</b>
	<b>Major focus</b> <b>4.4.3 Electrolysis</b>	<ul style="list-style-type: none"> <li>• The process of electrolysis</li> <li>• The electrolysis of molten ionic compounds</li> <li>• Using electrolysis to extract metals</li> <li>• The electrolysis of aqueous solutions</li> <li>• Representation of reactions at electrodes as half equations</li> </ul>	<b>Pages</b> <b>100 – 103</b>
	<b>Required Practical</b>	<b>Required practical 1 – preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution</b>  <b>Required practical 2 – determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration</b>	<b>Page 92</b>  <b>Pages 88-89</b>
<b>Topic 5</b> <b>Energy change</b>	<b>Major focus</b> <b>4.5.1 Exothermic and endothermic reactions</b>	<ul style="list-style-type: none"> <li>• Energy transfer during exothermic and endothermic reactions</li> <li>• Reaction profiles</li> <li>• Energy change of reactions – bond energies</li> </ul>	<b>Pages 106 - 109</b>
	<b>Required practical</b>	<b>Required practical 4 – Investigate the variables that affect the temperature changes in reacting solutions such as. E.g acid plus metals, acid plus carbonates, neutralisations, displacement of metals.</b>	<b>Page 107</b>

## Paper 2

			Revision Pages
<b>Topic 6 Rate and extent of chemical change</b>	<b>Major Focus 4.6.1 Rates of reaction</b>	<ul style="list-style-type: none"> <li>• Calculating rates of reaction</li> <li>• Factors which affect the rate of chemical reactions</li> <li>• Collision theory and activation energy</li> <li>• Catalysts</li> </ul>	Pages 117 - 124
	<b>Major Focus 4.6.2 Reversible reactions and dynamic equilibrium</b>	<ul style="list-style-type: none"> <li>• Reversible reactions</li> <li>• Energy changes and reversible reactions</li> <li>• Equilibrium</li> <li>• The effect of changing conditions on equilibrium</li> <li>• The effect of changing concentration</li> <li>• The effect of temperature changes on equilibrium</li> <li>• The effect of pressure changes on equilibrium</li> </ul>	Pages 127 – 129
	<b>Required Practical</b>	<b>Required practical 5: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.</b>	Pages 122 - 123
<b>Topic 7 – Organic chemistry</b>	<b>Major focus 4.7.1 Carbon compounds as fuels and feedstock</b>	<ul style="list-style-type: none"> <li>• Crude oil, hydrocarbons, and alkenes</li> <li>• Fractional distillation and petrochemicals</li> <li>• Properties of hydrocarbons</li> <li>• Cracking and alkenes</li> </ul>	Pages 132 - 135
<b>Topic 8 – Chemical analysis</b>	<b>Major focus 4.8.3 Identification of ions by chemical and spectroscopic means</b>	<ul style="list-style-type: none"> <li>• Flame tests</li> <li>• Metal hydroxide</li> <li>• Carbonates</li> <li>• Halides</li> <li>• Sulfates</li> <li>• Instrumental methods</li> <li>• Flame emission spectroscopy</li> </ul>	Pages 157 - 160
	<b>Required practical</b>	<b>Required practical activity 7: use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates</b>	Pages 157 - 158
<b>Topic 9 – Chemistry of the atmosphere</b>	<b>Major focus 4.9.1 The composition and the evolution of the earth's atmosphere</b>	<ul style="list-style-type: none"> <li>• The proportions of different gases in the atmosphere</li> <li>• The Earth's early atmosphere</li> <li>• How oxygen increased</li> <li>• How carbon dioxide decreased</li> </ul>	Pages 157 – 160
<b>Topic 10 – Using resources</b>	<b>Major focus 4.10.1 Using the Earth's resources and obtaining potable water</b>	<ul style="list-style-type: none"> <li>• Using the Earth's resources and sustainable development</li> <li>• Potable water</li> <li>• Wastewater treatment</li> <li>• Alternative methods of extracting metals</li> </ul>	Pages 178 - 179 184 - 186

	<b>Major focus</b> <b>4.10.4 The Haber process and the use of NPK fertilisers</b>	<ul style="list-style-type: none"><li>• The Haber process</li><li>• The production and uses of NPK fertilisers</li></ul>	Pages 188 – 191
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