AQA GCSE Chemistry: Higher Tier

Advance Information of Assessed Content 2022

Link to specification: GCSE Chemistry Specification Specification for first teaching in 2016 (aqa.org.uk)

Link to advance information document: Advanced information June 2022 - GCSE Chemistry (8462) (aqa.org.uk)

AQA GCSE Chemistry:
Higher Tier
Paper 1

Chemistry Triple Paper 1 - H

These specification points will be the **major focus** of this paper.

Exam date: 27th May

All other specification points from C1, other than those on these pages that are explicitly omitted, **may still be assessed** in multiple choice questions/linked to a previous answer, so cannot be completely ignored in your revision.

Spec point	Concepts	Bitesize	YouTube
4.1.2 The Periodic Table	• The Periodic Table is arranged in order of proton number • What atoms of elements in the same group have in common • What atoms of elements in the same period have in common • development in the Periodic Table • ions formed from metals and non-metals • trends in physical and chemical properties of group 1,7 and 0 elements • Reactions of group 1 and 7 elements	https://www.bbc.co.uk/bitesize/guides/z3sg2nb/revision/1 https://www.bbc.co.uk/bitesize/guides/zg923k7/revision/1 https://www.bbc.co.uk/bitesize/guides/zqwtcj6/revision/1	https://www.youtube.com/watch?v=IdS9roW7IzM&t=119s https://www.youtube.com/watch?v=uwzXfZoCP_k https://www.youtube.com/watch?v=dZGDUKQa_6g https://www.youtube.com/watch?v=HT1zAPQIBAQ
4.2.1 Chemical bonds, ionic, covalent and metallic	• Describe the process of ionic bonding • Describe the process of covalent bonding • Describe the process of metallic bonding • explain chemical bonding in terms of electrostatic forces and the transfer or sharing of electrons. • work out the charge on the ions of metals and non-metals from the group number of the element, limited to the metals in Groups 1 and 2, and non-metals in Groups 6 and 7 • Describe the structure of ionic compounds • draw dot and cross diagrams for the molecules of hydrogen, chlorine, oxygen, nitrogen, hydrogen chloride, water, ammonia and methane • Describe the structure of metals	https://www.bbc.co.uk/bitesize/guides/zyydng8/revision/1 https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1 https://www.bbc.co.uk/bitesize/guides/z8db7p3/revision/1	https://www.youtube.com/watch?v=6DtrrWA5nkE https://www.youtube.com/watch?v=lenvZEcMc60 https://www.youtube.com/watch?v=lhEm7aAKIDg https://www.youtube.com/watch?v=5I_1jRGSR9E https://www.youtube.com/watch?v=b1y2Q6YX1bQ https://www.youtube.com/watch?v=A-wTpLPICd0&t=13s
4.2.2 How bonding and structure are related to the properties of a substance	• interpreting melting and boiling point data to determine state at a certain temp • link energy needed to change state to strength of forces between particles • state symbols • describe & explain properties of ionic compounds • describe & explain properties of simple covalent molecules • describe & explain properties of polymers • describe & explain properties of metals and alloys	https://www.bbc.co.uk/bitesize/guides/zyydng8/revision/1 https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1 https://www.bbc.co.uk/bitesize/guides/z9twsrd/revision/1 https://www.bbc.co.uk/bitesize/guides/z8db7p3/revision/1	https://www.youtube.com/watch?v=leVxy7cjZMU https://www.youtube.com/watch?v=DECGNyC-x_s https://www.youtube.com/watch?v=EP0zfm_FVqc https://www.youtube.com/watch?v=A-wTpLPICd0

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Spec point	Concepts	Bitesize	YouTube
4.2.3 Structure and bonding of carbon	• describe and explain the properties of diamond, graphite, graphene and fullerenes	https://www.bbc.co.uk/bitesize/guides/z9twsrd/revision/1	https://www.youtube.com/watch?v=tGH0mXCcEFU
4.3.2 Use of amount of substance in relation to masses of pure substances	• calculating relative formula mass • calculating the number of moles in a given mass of a substance, calculating the mass of a certain no. of moles of a substance • Avogadro's constant – the number of particles in 1 mole of every substance • calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product. • using molar ratios to balance equations • identifying limiting reactants and explaining the effect on yield of products • define concentration of a solution • calculate the concentration of a solution, or the mass of a solute dissolved in a given volume to create a solution of given concentration	https://www.bbc.co.uk/bitesize/guides/zgcyw6f/revision/1 https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/1	https://www.youtube.com/watch?v=q49NwIrjaFw https://www.youtube.com/watch?v=wPGVQu3UXpw https://www.youtube.com/watch?v=TV6n5MFH6IU https://www.youtube.com/watch?v=YKvUQ2cPmJg https://www.youtube.com/watch?v=MuzOmFhiE8o https://www.youtube.com/watch?v=3G3KQIyoZDI
4.4.1 The Reactivity of Metals	• Metals + oxygen • Reduction and oxidation in terms of oxygen • reduction and oxidation in terms of electrons • identify in a given reaction, symbol equation or half equation which species are oxidised and which are reduced • The Reactivity Series • Displacement reactions • Extraction of metals by reduction	https://www.bbc.co.uk/bitesize/guides/zsm7v9q/revision/1	https://www.youtube.com/watch?v=Lk1V0buHEFs https://www.youtube.com/watch?v=gnbuTl2ariI https://www.youtube.com/watch?v=2i5Lm7BMtpo https://www.youtube.com/watch?v=MXTSels6e2Y

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Spec point	Concepts	Bitesize	YouTube
4.4.2 Reactions of Acids	• Naming Salts • products of the reactions of acids and metals • explain the reactions of metals and acids in terms of loss and gain of electrons • produces of the reactions of acids and alkalis and insoluble bases • products of the reactions of acids and metal carbonates • pH scale and neutralisation • difference between strong and weak acids	https://www.bbc.co.uk/bitesize/guides/zcjjfcw/revision/1	https://www.youtube.com/watch?v=ofw6oHSYGFI GCSE Science Revision Chemistry "Acids Reacting with Metals 2" - YouTube https://www.youtube.com/watch?v=QlSsle_jSQ8
4.4.2.3 and **Required Practical 1:** preparation of a pure, dry sample of soluble salts	• method of producing solid salt crystals from insoluble oxide or carbonate and acids • identifying errors in methods and reagents	https://www.bbc.co.uk/bitesize/guides/zcjjfcw/revision/6	https://www.youtube.com/watch?v=9GH95172Js8&t=16s GCSE Science Revision Chemistry "Strong and Weak Acids" – YouTube
4.4.2.5 and Required practical 2: determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.	• Method • control variables and how to monitor them • quantitative analysis of results	https://www.bbc.co.uk/bitesize/guides/zx98pbk/revision/1	https://www.youtube.com/watch?v=saRBT5oZfh8 https://www.youtube.com/watch?v=vn3Rx3g1VPk https://www.youtube.com/watch?v=x8DLLCNMKAs https://www.youtube.com/watch?v=ycC4oKteRJU
4.4.3 Electrolysis	• The process of electrolysis • identifying oxidation and reduction in terms of electrons • writing half equations for oxidation/reduction reactions occurring at each electrode • Electrolysis of molten ionic compounds • Electrolysis of aluminium oxide • Electrolysis of aqueous solutions, predicting products formed	https://www.bbc.co.uk/bitesize/guides/zcsyw6f/revision/1	https://www.youtube.com/watch?v=AhTRiL6xjBA&t=2s https://www.youtube.com/watch?v=ilNOpROacf0 https://www.youtube.com/watch?v=YcyMElBEzAY https://www.youtube.com/watch?v=6WjC_Vi4roA https://www.youtube.com/watch?v=W9ngXNxSyoo

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Spec point	Concepts	Bitesize	YouTube
4.5.1 Exothermic and endothermic reactions	• describe the law of the conservation of energy • define exo and endothermic reactions and describe their features • give examples of exo and endothermic reactions • define activation energy • represent exo and endothermic reactions with reaction profiles • describe bond breaking in the reactants as an endothermic process • describe bond formation in the products as an exothermic process • calculate the energy transferred in chemical reactions using bond energies supplied • Use energy change values to identify if a reaction is exo/endothermic	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/revision/1	https://www.youtube.com/watch?v=4HS6D0hTzdg https://www.youtube.com/watch?v=dstRL5xB0Sk https://www.youtube.com/watch?v=it0HGXhxD-s https://www.youtube.com/watch?v=eExCBkp4jB4 https://www.youtube.com/watch?v=PdValXAVUOc
Required Practical 4: investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, carbonates, neutralisations, displacement of metals	• Identifying independent, dependent, control variables • Analysing results • identifying exo and endothermic reactions from experimental results	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/revision/2	https://www.youtube.com/watch?v=Bz0C9mmF2tw

This specification point will **not be assessed** on this paper:

Spec point
4.2.4 Bulk and surface properties of matter including nanoparticles

AQA GCSE Chemistry:
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Paper 2

Chemistry Triple Paper 2 - H

These specification points will be the **major focus** of this paper.

Exam date: 20th June

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Spec point	Concepts	Bitesize	YouTube
4.6.1 Rate of Reaction	• Calculating the rate of a reaction • Calculate the gradient of a tangent to the curve on these graphs as a measure of rate of reaction at a specific time. • Describe collision theory • Define activation energy • Describe and explain the factors that increase the rate of reaction • Describe and explain the effect of catalysts on rate of reaction	https://www.bbc.co.uk/bitesize/guides/z3nbqhv/revision/1	https://www.youtube.com/watch?v=UkrBJ6-uGFA https://www.youtube.com/watch?v=GCR5xeduq2o https://www.youtube.com/watch?v=-4HXaUBbv04 https://www.youtube.com/watch?v=hel8fQjxcO8
Required Practical 5: investigate how concentration affects the rates of reaction by a method involving measuring the volume of a gas produced/change in colour	• identify independent, dependent and control variables • describe how to measure the dependent variable • analyse results and draw conclusions from graphed data • calculate rate of reaction from data	Required practical - measure the production of a gas - Rates of reaction - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize	https://www.youtube.com/watch?v=N5p06i9ilmo https://www.youtube.com/watch?v=Gl6LVl7oAlU
4.6.2 Reversible reactions and dynamic equilibrium	• Identify and give examples of reversible reactions • Apply the conservation of energy to reversible reactions • Define dynamic equilibrium • Describe Le Chatelier's principle • Describe and explain the effect of changing the following conditions on equilibrium; concentration, temperature, pressure	https://www.bbc.co.uk/bitesize/guides/zyhvw6f/revision/1	https://www.youtube.com/watch?v=66qcNNJFy6E GCSE Science Revision Chemistry "Concentration and Reversible Reactions" – YouTube GCSE Science Revision Chemistry "Pressure and Reversible Reactions" – YouTube GCSE Science Revision Chemistry "Temperature and reversible reactions" – YouTube GCSE Chemistry - Le Chatelier's Principle #42 (Higher Tier) – YouTube

Chemistry Triple Paper 2 - H

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Exam date: 20th June

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Spec point	Concepts	Bitesize	YouTube
4.7.1 Carbon compounds as fuels and feedstock	• describe crude oil as a mixture of different length hydrocarbons • define the term hydrocarbon • identify the first 4 alkanes from their chemical formula and name them • Describe the trend in properties as hydrocarbon chain length increases • Describe and explain the process of fractional distillation • describe the process of cracking • describe the use of alkenes	https://www.bbc.co.uk/bitesize/guides/zshvw6f/revision/1	https://www.youtube.com/watch?v=CX2IYWggEBc https://www.youtube.com/watch?v=3I7yCkSXPos https://www.youtube.com/watch?v=7AWwjKbRa_o
Required practical 7: use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates.	• Describe reagents and positive results for each ion • Describe method of flame tests	https://www.bbc.co.uk/bitesize/guides/zxtvw6f/revision/1	https://www.youtube.com/watch?v=Bd0A44Iv2OI&t=96s https://www.youtube.com/watch?v=4iZRs4XIJOE https://www.youtube.com/watch?v=mWTgHjdea4Y https://www.youtube.com/watch?v=fCZztwJmAl0
4.9.1 The composition and evolution of the Earth's Atmosphere	• describe the composition of the current atmosphere • describe the composition of the early atmosphere and explain theories of how the early atmosphere formed • explain how the early atmosphere changed to that of the present atmosphere	https://www.bbc.co.uk/bitesize/guides/zg4qfcw/revision/1	https://www.youtube.com/watch?v=t1Z3GlNIdLA https://www.youtube.com/watch?v=l0h_-3M0Pso

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Spec point	Concepts	Bitesize	YouTube
4.10.1 Using the Earth's resources and obtaining potable water	• Describe the renewable and non-renewable resources that we get form the Earth and its atmosphere • Define the term potable water • Describe how potable water can be produced. • Describe the differences in the treatment of waste water, salt water and ground water • Describe and evaluate alternative methods of extracting metals e.g. phytomining and bioleaching	https://www.bbc.co.uk/bitesize/guides/zgqhcj6/revision/1 https://www.bbc.co.uk/bitesize/guides/zpcjsrd/revision/1 Biological methods of metal extraction - Higher - Ways of reducing the use of resources - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize	https://www.youtube.com/watch?v=-XczTGavTZU https://www.youtube.com/watch?v=n7pYRQs20bI https://www.youtube.com/watch?v=b5RVPauf4oM
4.10.4 The Haber process and the use of NPK fertilisers	• Describe the purpose of the Haber process, the reaction and raw materials involved • interpret graphs of reaction conditions versus rate • apply the principles of dynamic equilibrium in Reversible reactions and dynamic equilibrium (4.6.2) to the Haber process • explain the trade-off between rate of production and position of equilibrium • explain how the commercially used conditions for the Haber process are related to the availability and cost of raw materials and energy supplies, control of equilibrium position and rate • Describe NPK fertilisers as formulations of various salts containing appropriate percentages of the elements. • Describe the composition of NPK fertilisers and how they are made • recall the names of the salts produced when phosphate rock is treated with nitric acid, sulfuric acid and phosphoric acid	https://www.bbc.co.uk/bitesize/guides/z9tvw6f/revision/1	https://www.youtube.com/watch?v=1_HoWz5Kxfk https://www.youtube.com/watch?v=HAkaD6-7fgQ https://www.youtube.com/watch?v=rKzt9BvvEeQ

This specification point will **not be assessed** on this paper:

Spec point
4.9.2 Carbon dioxide and methane as greenhouse gases