Revision Sheets

AQA GSCE Trilogy Chemistry Paper 1 Higher

Name: Class:

10 Minutes on....

Atoms, Elements And Compounds

Key Term	Definition
Atom	
Element	
Compound	
Periodic Table	

Compare elements and compounds.

Use a periodic table to name the first 10 elements and identify their symbols.

10 Minutes on....

Mixtures

Key Term	Definition
Mixture	

Separation Technique	Description	Example of Use
Filtration		
Crystallisation		
Simple Distillation		
Fractional Distillation		
Chromatography		

10 Minutes on....

Development of the Model of the Atom

Compare the plum pudding and nuclear model of the atom.

Explain how the scattering experiment led to a change in the atomic model.

10 Minutes on....

Relative Electrical Charges

Key Term	Definition
Atomic Number	

Particle	Relative Charge
Proton	
Neutron	
Electron	

Identify what determines the element an atom is.

Explain why atoms are neutral.

Describe the structure of a lithium atom.

10 Minutes on....

Size and Mass of Atoms

Key Term	Definition
Mass Number	
Isotope	

Particle	Relative Mass
Proton	
Neutron	
Electron	

Identify where most of an atoms mass is located.

Radius of an Atom	
Radius of an Atoms Nucleus	

Explain how to calculate the numbers of protons neutrons and electrons when given the atomic number and mass number.

10 Minutes on....

Relative Atomic Mass

Key Term	Definition
Relative Atomic Mass	
Isotope	

Explain how to calculate relative atomic mass of an element if you know the mass and abundance of its isotopes.

	Question	Answer
1	Calculate the atomic mass of chlorine when the abundance of chlorine-35 is 75% and the abundance of chlorine-37 is 25%.	
2	Calculate the atomic mass of copper when the abundance of copper-63 is 70% and the abundance of copper-65 is 30%.	
3	Calculate the atomic mass of magnesium when the abundance of magnesium-24 is 79%, magnesium-25 is 10% and the abundance of magnsium-26 is 11%.	

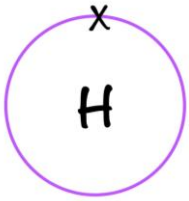
10 Minutes on....

Electronic Structures

Key Term	Definition
Electron Configurations	

Energy Level	Max No. of Electrons
1	
2	
3	

In the following spaces construct electron configuration diagrams for the first 20 elements. One has been done for you.

Hydrogen	Helium
	
1	

Lithium	Beryllium

10 Minutes on....

Electronic Structures

Boron

Carbon

Nitrogen

Oxygen

Fluorine

Neon

10 Minutes on....

Electronic Structures

Sodium

Magnesium

Aluminium

Silicon

Phosphorus

Sulfur

10 Minutes on....

Electronic Structures

Chlorine

Argon

Potassium

Calcium

10 Minutes on....

Periodic Table

Key Term	Definition
Periodic Table	

Describe how elements in the periodic table are arranged.

Explain why elements in the same group have similar chemical properties.

Explain what the position of an element in the periodic table tells you about its electron configuration.

10 Minutes on....

Development of the Periodic Table

Describe how elements were arranged before the periodic table.

Problems in The Early Periodic Table	Hoe Mendeleev Overcame This Problem

Explain why over time Mendeleev's periodic table was accepted.

Identify how elements are now ordered in the periodic table.

10 Minutes on....

Metals and Non-Metals

Type of Element	Description	Where Found on the Periodic Table
Metal		
Non-Metal		

Compare the properties of metals and non-metals.

Explain how the atomic structure of metals and non-metals relates to their position on the periodic table.

10 Minutes on....

Group 0

Key Term	Definition
Noble Gas	

Describe the properties of the noble gases.

Explain why noble gases are not reactive.

Identify what happens to boiling point of the noble gases going down the group.

10 Minutes on....

Group 1

Key Term	Definition
Alkali Metals	

Construct word and symbol equations to model the reaction between the first three alkali metals and oxygen.

Construct word and symbol equations to model the reaction between the first three alkali metals and chlorine.

Construct word and symbol equations to model the reaction between the first three alkali metals and water.

10 Minutes on....

Group 7

Key Term	Definition
Halogens	
Displacement	

Halogen	Formula	Appearance at Room Temperature
Fluorine		
Chlorine		
Bromine		
Iodine		

Identify what happens to melting and boiling point of the halogens as you go down the group.

Explain what determines the properties of elements in Group 7.

10 Minutes on....

Group 1 and 7 Reactivity

Explain what happens to the reactivity of group 1 elements as you go down the group.

Explain what happens to the reactivity of group 7 elements as you go down the group.

10 Minutes on....

Chemical Bond

Type of Bond	What Happens to Electrons	When Bond Occurs	Diagram	Example
Ionic				
Covalent				
Metallic				

10 Minutes on....

Ionic Bonding

Key Term	Definition
Ionic Bond	
Ion	

Group	Ion Formed
1	
2	
6	
7	

Describe how to determine the charge an ion will form.

Explain what happens in terms of electron transfer what happens when the ionic compound sodium chloride forms. Use the space below to construct a diagram to model this.

10 Minutes on....

Ionic Compounds

Key Term	Definition
Ionic Compound	

Model of An Ionic Compound	Diagram	Limitations of Model
2D Diagram		
Ball and Stick		
3D Diagram		

Describe the structure and bonding of an ionic compound.

10 Minutes on....

Covalent Bonding

Key Term	Definition
Covalent Bond	

Small Covalent Molecules	Giant Covalent Structures

Molecule	Formula	Dot Cross Diagram
Hydrogen		
Chlorine		
Oxygen		
Nitrogen		
Hydrogen Chloride		
Water		
Ammonia		
Methane		

10 Minutes on....

Metallic Bonding

Key Term	Definition
Metallic Bond	

Describe how metallic bonds form.

Construct a diagram to model the formation of metallic bonds.

10 Minutes on....

3 States of Matter

Key Term	Definition
Melting Point	
Boiling Point	

Particle Models	Solid	Liquid	Gas

State of Matter	Symbol
Solid	
Liquid	
Gas	
Aqueous Solution	

Identify the limitations of the particle models above.

Describe what the amount of energy needed to change state depends on.

10 Minutes on....

Properties of Ionic Compounds

Describe the structure and bonding of ionic compounds.

Property	Explanation
High Melting and Boiling Point	
Do Not Conduct Electricity When Solid	
Conducts Electricity When Melted or Dissolved	

10 Minutes on....

Properties of Small Molecules

Describe what happens when small molecules change state.

Identify and explain what happens to boiling point when the size of the molecule increases.

Property	Explanation
Low Melting and Boiling Point	
Do Not Conduct Electricity	

10 Minutes on....

Polymers

Key Term	Definition
Polymers	

Describe how atoms in a polymer are bonded together.

Construct a diagram to model a polymer.

Explain why polymers are solids at room temperature.

10 Minutes on....

Giant Covalent Structures

Key Term	Definition
Giant Covalent Structure	

	Diamond	Graphite	Silicon Dioxide
Diagrams			

Explain why giant covalent structures have high melting and boiling points.

10 Minutes on....

Properties of Metals And Alloys

Key Term	Definition
Metallic Bond	

Explain why metals can be bent and shaped. Use the space below to construct a diagram to support your answer.

Explain why alloys are harder than pure metals. Use the space below to construct a diagram to support your answer.

10 Minutes on....

Metals as Conductors

Construct a labelled diagram to model electronic bonding.

Explain why metals are good conductors of electricity.

Explain why metals are good conductors of thermal energy.

10 Minutes on....

Diamond

Describe the structure and bonding of diamond. Use the space below to also construct a diagram to support your answer.

Property	Explanation
High Melting and Boiling Point	
Hard	
Doesn't Conduct Electricity	

10 Minutes on....

Graphite

Describe the structure and bonding of graphite. Use the space below to also construct a diagram to support your answer.

Property	Explanation
High Melting and Boiling Point	
Soft	
Conducts Electricity	

10 Minutes on....

Graphene

Describe the structure and bonding of graphene. Use the space below to also construct a diagram to support your answer.

Property	Explanation
High Melting and Boiling Point	
Very Strong	
Conducts Electricity	

10 Minutes on....

Graphene and Fullerenes

Material	Structure and Bonding	Properties	Diagram	Uses
Graphene				
Fullerenes				
Carbon Nanotubes				

10 Minutes on....

Conservation of Mass

Key Term	Definition
Law of Conservation of Mass	

Explain why chemical equations must be balanced.

Explain why when balancing the equation: $CH_4 + O_2 \rightarrow CO_2 + H_2O$ the following would be incorrect: $CH_4 + O_2 \rightarrow CO_2 + 2H_2O_2$

10 Minutes on....

RFM

Key Term	Definition
Relative Formula Mass	

Substance	Formula	RFM
Water		
Carbon Dioxide		
Methane		

Task	Mass of Substance	RFM of molecule	(Mass of Substance / RFM) x 100	Answer
Determine the % mass of C in CO_2				
Determine the % mass of C in CO_2				
Determine the % mass of H in H_2O				
Determine the % mass of O in H_2O				
Determine the % mass of H in CH_4				

10 Minutes on....

Mass Changes

Key Term	Definition
Law of Conservation of Mass	

Explain why mass may appear to increase during a chemical reaction.

Explain why mass may appear to decrease during a chemical reaction.

10 Minutes on....

Chemical Measurements

Key Term	Definition
Uncertainty	
Resolution	

Describe how to calculate uncertainty from repeat measurements.

Calculate uncertainty for the following data:	15cm, 17cm, 14cm, 18cm, 13cm	31°C, 28°C, 33°C, 31°C, 27°C	231m, 233m, 245m, 244m, 244m	4.2N, 4.3N, 4.2N, 4.6N, 4.3N
Determine the range.				
Divide by 2				
State answer with units.				

Describe how to determine the uncertainty of measuring instruments.

Determine uncertainty for the following apparatus:	Thermometer with a resolution of 1°C	Ruler with a resolution of 1mm	Balance with a resolution of 0.01g	Beaker with a resolution of $20cm^3$
Divide resolution by 2.				

10 Minutes on....

Moles

Key Term	Definition
Mole	
Avogadro Constant	

Question	Calculate the mass of 0.25mol of CO_2.	Calculate the mass of 2 mol of H_2O.	Calculate the mass of 2.8 mol of NaCl.	Calculate the mass of 0.2 mol of H_2.
Calculate the RFM of the molecule				
Multiply the RFM by the number of moles				
State answer with units.				

Question	Calculate the number of moles in 22g of CO_2	Calculate the number of moles in 14g of H_2O	Calculate the number of moles in 64mg of $MgCO_3$	Calculate the number of moles in 12mg of NaCl
Check for unit conversions.				
Calculate the RFM				
Divide the mass by the RFM				
Round				

10 Minutes on....

Amounts of Substances in Equations

Identify the number of moles of the products and reactants within the reaction:

$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

For the equation above...

Question	Calculate the mass of H_2 produced if an excess of acid is added to 100g of Mg.	Calculate the mass of Mg that will be needed to produce 250g of magnesium chloride.	Calculate the mass of $MgCl_2$ produced if an excess of acid is added to 1.5kg of Mg.
Check for unit conversions.			
Calculate the RFM of the chemicals in the question.			
Divide the known mass by the RFM of that substance.			
Multiply by the RFM of the other substance.			
State answer to correct number of sig fig.			

10 Minutes on....

Using Moles To Balance Equations

Describe how the balancing number in a symbol equation can be calculated.

Reactants	Products	Mole Calculations	Ratio	Balanced Symbol Equation
Mg = 24g O_2 = 16g	MgO = 40g			
$BeCl_2$ = 40g K = 39g	KCl = 74.5g Be = 4.5g			
P_4 = 124g O_2 = 160g	P_4O_{10}=284g			
H_2 = 12g O_2 = 96g	H_2O = 108g			
Al = 27g O_2 = 12g	Al_2O_3 = 51g			

10 Minutes on....

Limiting Reactants

Key Term	Definition
Limiting Reactant	

For the questions below use the equation: $2Al + Fe_2O_3 \rightarrow 2\ Fe + Al_2O_3$

Determine the limiting factor when....	1.00kg of aluminium is mixed with 3.00kg of iron oxide.	1.50kg of aluminium is mixed with 3.00kg of iron oxide.	1.58kg of aluminium is mixed with 8.54kg of iron oxide.
Convert units.			
Calculate RFM's			
Calculate No of Moles of Reactant 1			
Calculate No of Moles of Reactant 2			
Determine the No of Moles Needed			
Identify Limiting Reactant			

10 Minutes on....

Concentration of Solutions

Key Term	Definition
Concentration	

Quantity	Unit
Concentration	
Mass	
Volume	

Identify the equation that should be used to calculate concentration.

Calculate the conc. of...	300g of $CuCl_2$ dissolved in $1dm^3$ of water.	A solution of hydrochloric acid that contains 3.2g of hydrogen chloride in $50cm^3$	1g of copper sulfate dissolved in water to make $25cm^3$ of copper sulfate solution.
Convert Units			
Divide Mass by Volume			
State answer			
Round and add units.			

10 Minutes on....

Metal Oxides

Key Term	Definition
Reduction	
Oxidation	
Oxidation Reaction	

Describe the reaction between metals and oxygen.

Construct word and symbol equations for the reactions between the following metals and oxygen: Lithium, Magnesium, Aluminium

HINT: Ions each forms, Li^{+}, Mg^{2+}, Al^{3+}, O^{2-}

10 Minutes on....

Reactivity Series

Key Term	Definition
Reactivity	

Identify the non-metals often included in the reactivity series.

Identify what determines the reactivity of a metal.

Construct a method that you could use to deduce the order of reactivity of metals.

10 Minutes on....

Extraction of Metals

Key Term	Definition
Reduction	

Identify an unreactive metal found on Earth.

Identify how metals less reactive than carbon can be extracted from their oxides.

Construct word equations and symbol equations to model the reactions between the following oxides and carbon:: Copper Oxide, Iron Oxide, Lead Oxide

HINT: Ions involved are Cu^{2+}, Pb^{2+}, Fe^{3+}, O^{2-}

10 Minutes on....

Oxidation and Reduction

Key Term	Definition
Oxidation	
Reduction	

Explain how to determine in a symbol equation which species are oxidised, and which are reduced.

Construct ionic equations for the following displacement reactions:

10 Minutes on....

Reactions of Acids With Metals

Construct a general word equation to show what happens when metals react with acids.

Ions: Mg^{2+}, Zn^{2+}, Fe^{3+}, SO_4^{2-}, Cl^-

Metal	Acid	Word and Symbol Equations
Magnesium	Hydrochloric	
Zinc	Hydrochloric	
Iron	Hydrochloric	
Magnesium	Sulfuric	
Zinc	Sulfuric	
Iron	Sulfuric	

10 Minutes on....

Neutralisation of Acids

Key Term	Definition
Alkali	
Bases	
Neutralisation	

Construct a general word equation to show what happens when an acid reacts with a metal hydroxide.

Construct a general word equation to show what happens when an acid reacts with a metal oxide.

Construct a general word equation to show what happens when an acid reacts with a metal carbonate.

Acid	Type of Salt Formed
Hydrochloric	
Nitric	
Sulfuric	

10 Minutes on....

Soluble Salts

Describe how to make a soluble salt.

Explain why the solid should be added in excess.

Explain why the solution should be filtered.

10 Minutes on....

Making Salts RP

Construct a method to prepare a pure, dry sample of a soluble salt. Use the space below to draw a diagram of how equipment would be set up.

10 Minutes on....

pH Scale and Neutralisation

Key Term	Definition
pH Scale	
Universal Indicator	
pH Probe	
Hydrogen Ion	
Hydroxide Ion	

Type of Substance	pH
Acid	
Neutral	
Alkali	

Describe in terms of ions what happens during neutralisation.

Explain how to use universal indicator to determine the pH of a substance.

10 Minutes on....

Strong and Weak Acids

Key Term	Definition
Strong Acid	
Weak Acid	
Dilute Acid	
Concentrated Acid	

Examples of Strong Acids	Examples of Weak Acids

Describe the relationship between the strength of an acid and its pH

Describe the relationship between pH and the hydrogen ion concentration.

10 Minutes on....

Process of Electrolysis

Key Term	Definition
Electrolysis	
Electrolyte	

Describe the process of electrolysis.

Construct a diagram to model the process of electrolysis.

10 Minutes on....

Electrolysis of Molten Ionic Compounds

Key Term	Definition
Electrolysis	
Ionic Compound	

Describe what would happen during the electrolysis of lead bromide.

Molten Ionic Compound	Product at the Cathode	Product at the Anode
Zinc Chloride		
Aluminium Oxide		
Zinc Bromide		
Calcium Chloride		

10 Minutes on....

Electrolysis to Extract Metals

Explain when metals are extracted using electrolysis.

Explain how aluminium is extracted using electrolysis.

Construct a diagram to model the extraction of aluminium using electrolysis.

10 Minutes on....

Electrolysis of Aqueous Solutions

Explain when hydrogen is produced at the cathode.

Explain when oxygen is produced at the anode.

Aqueous Solution	Product at the Cathode	Product at the Anode	Justification
Calcium Chloride			
Copper Bromide			
Copper Sulfate			
Potassium Sulfate			
Copper Chromate			
Zinc Chloride			

10 Minutes on....

Electrolysis RP

Construct a method to investigate what happens when aqueous solutions are electrolysed using inert electrodes Use the space below to draw a diagram of how equipment would be set up.

10 Minutes on....

Half Equations

Electrode	Definition	What Happens There in Terms of Electrons
Cathode		
Anode		

Construct a half equation to model what happens at the cathode.

Construct a half equation to model what happens at the anode.

10 Minutes on....

Energy Transfer During Reactions

Key Term	Definition	Example
Exothermic Reaction		
Endothermic Reaction		

Describe the law of conservation of energy.

10 Minutes on....

Energy Changes RP

Construct a method to investigate the variables that affect the temperature changes when a metal reacts with an acid. Use the space below to draw a diagram of how equipment would be set up.

10 Minutes on....

Reaction Profile

Key Term	Definition
Reaction Profile	
Activation Energy	

Describe what is required for particles to react.

Construct a labelled reaction profile for an endothermic reaction.

Construct a labelled reaction profile for an exothermic reaction.

10 Minutes on....

Energy Changes of Reactions

Describe what happens in terms of bonds during chemical reactions.

Explain how to calculate the overall energy change of a reaction.

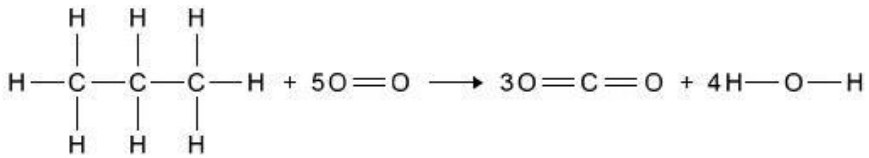
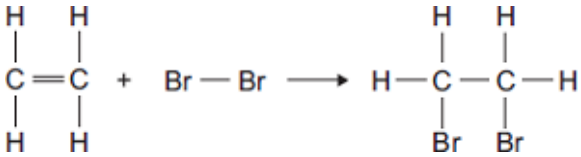
Explain how to identify an exothermic reaction when calculating bond energies.

Explain how to identify an endothermic reaction when calculating bond energies.

10 Minutes on....

Energy Changes of Reactions

Bond	Bond Dissociation Energy (kJ/mol)	Bond	Bond Dissociation Energy (kJ/mol)
O-O	138	C-Cl	327
O=O	496	Cl-Cl	243
O-H	463	H-Cl	432
C-C	347	C=C	614
C-H	413	Br-Br	193
C=O	799	C-Br	276

	Reaction
A	
B	
C	
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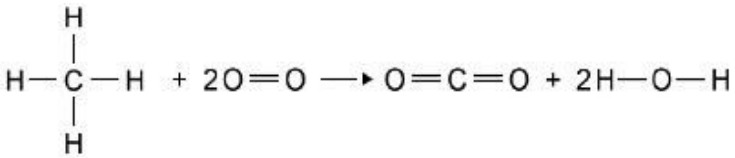
E	

10 Minutes on....

Energy Changes of Reactions

Reaction	Bonds Broken	Bonds Made	Bonds Broken – Bonds Made	Answer
A				
B				
C				
D				
E				