

Edexcel Igcse Chemistry Chapter 6 Page 51 Answers

Edexcel Igcse Chemistry Chapter 6 Page 51 Answers Edexcel IGCSE Chemistry Chapter 6 Page 51 Answers and Explanations This article will provide answers and explanations for the questions found in Edexcel IGCSE Chemistry Chapter 6 page 51 The chapter focuses on the reactivity of metals a crucial concept in understanding chemical reactions and their applications Before we begin remember Understanding the concepts Relying solely on answers wont help you master the material Read the chapter carefully make notes and try to answer the questions yourself before consulting this guide Active learning Use this guide to reinforce your understanding Refer back to the chapter for relevant explanations and examples Practice makes perfect Solve additional practice problems to further solidify your knowledge Lets delve into the answers

Question 1 a What is meant by the term reactivity series The reactivity series is a list of metals arranged in order of their decreasing reactivity It helps us understand how readily metals react with other substances particularly acids and water b How can the reactivity series be used to predict the outcome of a reaction between a metal and an acid The reactivity series helps predict the outcome of a reaction between a metal and an acid based on their relative positions Metals above hydrogen in the series These metals are more reactive than hydrogen They will react with acids to produce hydrogen gas and a salt Metals below hydrogen in the series These metals are less reactive than hydrogen They will not react with dilute acids c Why is the reactivity series useful for predicting the outcome of a reaction between a metal and a solution of a metal salt The reactivity series also predicts the outcome of a reaction between a metal and a solution of a metal salt Heres how A more reactive metal will displace a less reactive metal from its salt solution For example iron Fe is more reactive than copper Cu If we add iron to a solution of copper sulfate CuSO_4 the iron will displace copper from the solution forming iron sulfate FeSO_4 and copper metal A less reactive metal will not displace a more reactive metal from its salt solution Conversely if we add copper to a solution of iron sulfate no reaction will occur

Question 2 a Write a balanced symbol equation for the reaction between magnesium and dilute hydrochloric acid The balanced symbol equation for the reaction is $\text{Mg} + 2\text{HCl}(\text{aq}) \rightarrow \text{MgCl}_2(\text{aq}) + \text{H}_2(\text{g})$ b Describe how you would carry out an experiment to investigate the reaction between magnesium and dilute hydrochloric acid Heres a detailed description of the experiment

- 1 Safety Precautions Wear safety goggles and gloves Ensure the experiment is carried out in a wellventilated area
- 2 Materials Magnesium ribbon cleaned with sandpaper Dilute hydrochloric acid HCl Test tube Delivery tube Beaker Bunsen burner Splint for testing the gas
- 3 Procedure Fill a test tube with dilute hydrochloric acid Carefully add a small piece of magnesium ribbon to the acid Observe the reaction noting any changes in appearance and the production of gas bubbles Use the delivery tube to collect the gas produced in a beaker
- 3 Test the gas collected with a lit splint If the splint extinguishes with a squeaky pop it indicates the presence of hydrogen gas

c What observations would you expect to make during this experiment During the experiment you would observe Fizzing The magnesium ribbon will react with the acid producing bubbles of hydrogen gas Dissolving The magnesium ribbon will gradually dissolve in the acid Temperature change The solution will become warm due to the exothermic reaction Gas test When the collected gas is tested with a lit

splint the splint will extinguish with a squeaky pop confirming the presence of hydrogen gas

Question 3 a Explain why the reaction between calcium and water is more vigorous than the reaction between magnesium and water Calcium is more reactive than magnesium This means that calcium has a greater tendency to lose electrons and form positive ions Consequently calcium reacts more vigorously with water releasing more energy in the form of heat and producing hydrogen gas more rapidly b Write a balanced symbol equation for the reaction between calcium and water The balanced symbol equation for the reaction is $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$ c Why is it dangerous to add potassium to water Potassium is a highly reactive metal The reaction between potassium and water is extremely vigorous and releases a large amount of heat The heat can ignite the hydrogen gas produced leading to an explosion

Question 4 a Explain how the reactivity series can be used to predict the outcome of a reaction between a metal and a solution of a metal salt As explained earlier a more reactive metal will displace a less reactive metal from its salt solution This is based on the tendency of a more reactive metal to lose electrons and form positive ions The more reactive metal will displace the less reactive metal from its ionic compound b Write a balanced symbol equation for the reaction between iron and copper sulfate 4 solution The balanced symbol equation for the reaction is $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$ c Describe what you would observe if you added a piece of iron to a solution of copper sulfate You would observe Color change The blue color of the copper sulfate solution will fade as the copper ions are replaced by iron ions which form a pale green solution Formation of a reddishbrown solid A reddishbrown solid copper metal will start to deposit on the surface of the iron piece

Question 5 a Why are metals used in the construction of buildings Metals are used in construction for various reasons Strength and durability They are strong and durable materials that can withstand high loads and resist wear and tear Corrosion resistance Some metals like stainless steel are resistant to rust and corrosion making them suitable for outdoor applications Malleability and ductility Metals are malleable can be hammered into shapes and ductile can be drawn into wires which allows for flexibility in design Conductivity Metals conduct heat and electricity well making them suitable for various electrical and heating applications b Why are some metals used in the manufacture of jewelry Metals are used in jewelry because of their Appearance They have a lustrous appearance and come in a variety of colors making them aesthetically pleasing Malleability and ductility They can be shaped into intricate designs and formed into delicate pieces of jewelry Durability Some metals are resistant to scratches and wear ensuring longevity and durability of the jewelry Value Precious metals like gold and silver are valued for their rarity and beauty making them desirable for jewelry 5 c Give one example of a metal that is used in the manufacture of airplanes and explain why this metal is suitable for this purpose Aluminum is widely used in airplane construction It is chosen because of its Lightness It is a light metal crucial for reducing the weight of the airplane Strength and durability Despite its lightness it is strong and durable enough to withstand the stresses of flight Corrosion resistance Aluminum is resistant to corrosion important for maintaining the structural integrity of the aircraft Remember This guide provides answers and explanations but it is not a replacement for thorough understanding of the concepts Actively engage with the chapter practice additional problems and seek further clarification when needed Good luck with your IGCSE Chemistry studies

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