



**Chemistry 1 Topic 5  
Assessed homework**

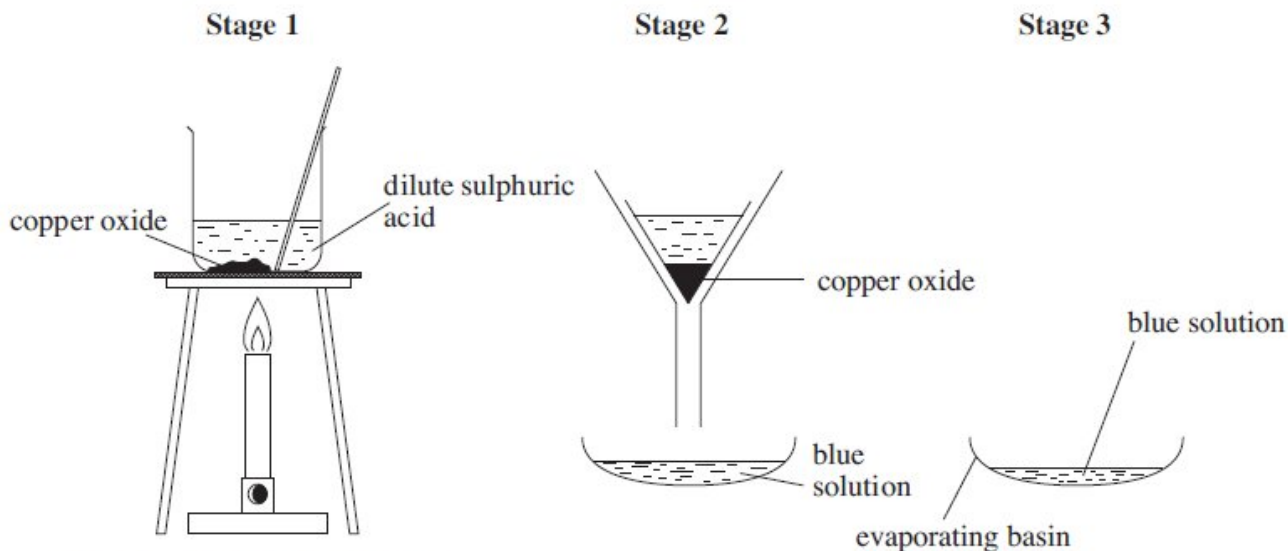
**Reactions of Acids  
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Name.....

Teacher.....

Mark /32.....

1) The diagrams below show stages in making the compound copper sulphate by reacting copper oxide with dilute sulphuric acid.



Copper oxide is added to warm dilute sulphuric acid until *all* the acid is used up. The mixture is continuously stirred.

a) Describe what you would expect to **see** when all the acid has been used up. [1]f

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b) Choose terms from the box below to answer parts i) –iii). **Each term may be used once, more than once or not at all.**

boiling	copper oxide	copper sulphate	dissolving	evaporation
insoluble	soluble	sulphuric acid	water	

i) Give the property of copper oxide that allows it to be removed by filtering in **Stage 2** [1]f

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ii) Name the substance being removed during **Stage 3** [1]f

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iii) Write a **word** equation which represents the reaction in **Stage 1**. [2]f

..... + ..... → ..... + .....

2) The following table shows the colours of universal indicator at different pH values

Colour	Red	Orange	Yellow	Green	Blue	Navy blue	Purple
pH	0 - 2	3 - 4	5 - 6	7	8 - 9	10 - 11	13 - 14

a) Sodium carbonate solution turns universal indicator navy blue. Give the pH range of this solution [1]f/h

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b) The pH of hydrochloric acid is 1. Give the colour of universal indicator in a solution of hydrochloric acid and state what this value tells you about the strength of this acid [2]f/h

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c) When sodium carbonate reacts with hydrochloric acid, a colourless gas is produced that turns limewater cloudy. The reaction is exothermic

i) Name the gas ..... [1]f/h

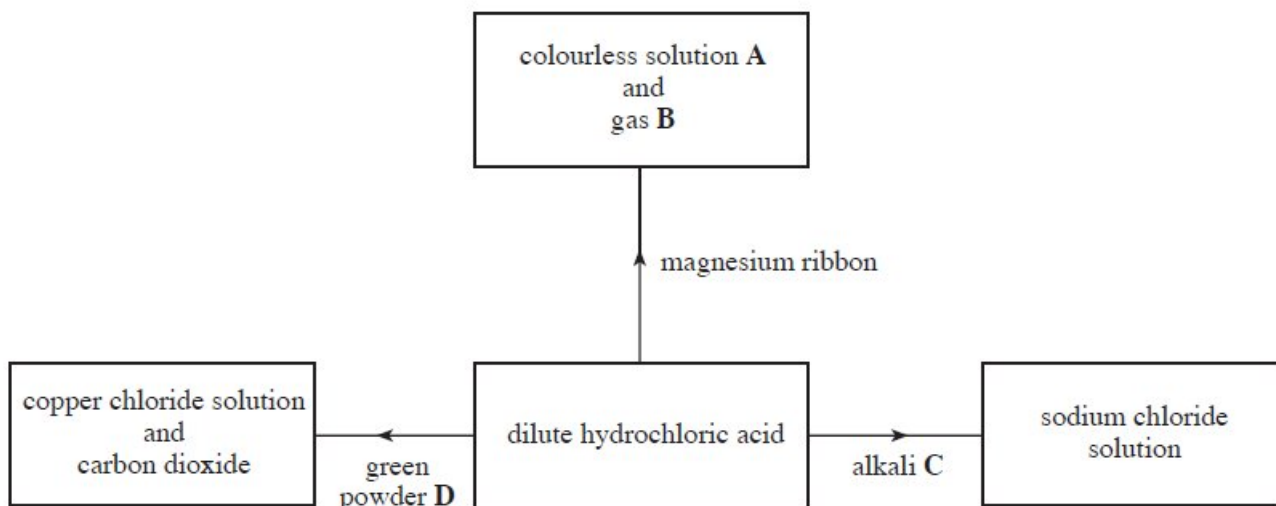
ii) What is meant by the term exothermic? .....

.....[1]f/h

iii) Write a **word** equation for the reaction between sodium carbonate and hydrochloric acid [2] f/h

..... + ..... → ..... + ..... + .....

3) The diagram below shows some reactions of dilute hydrochloric acid.



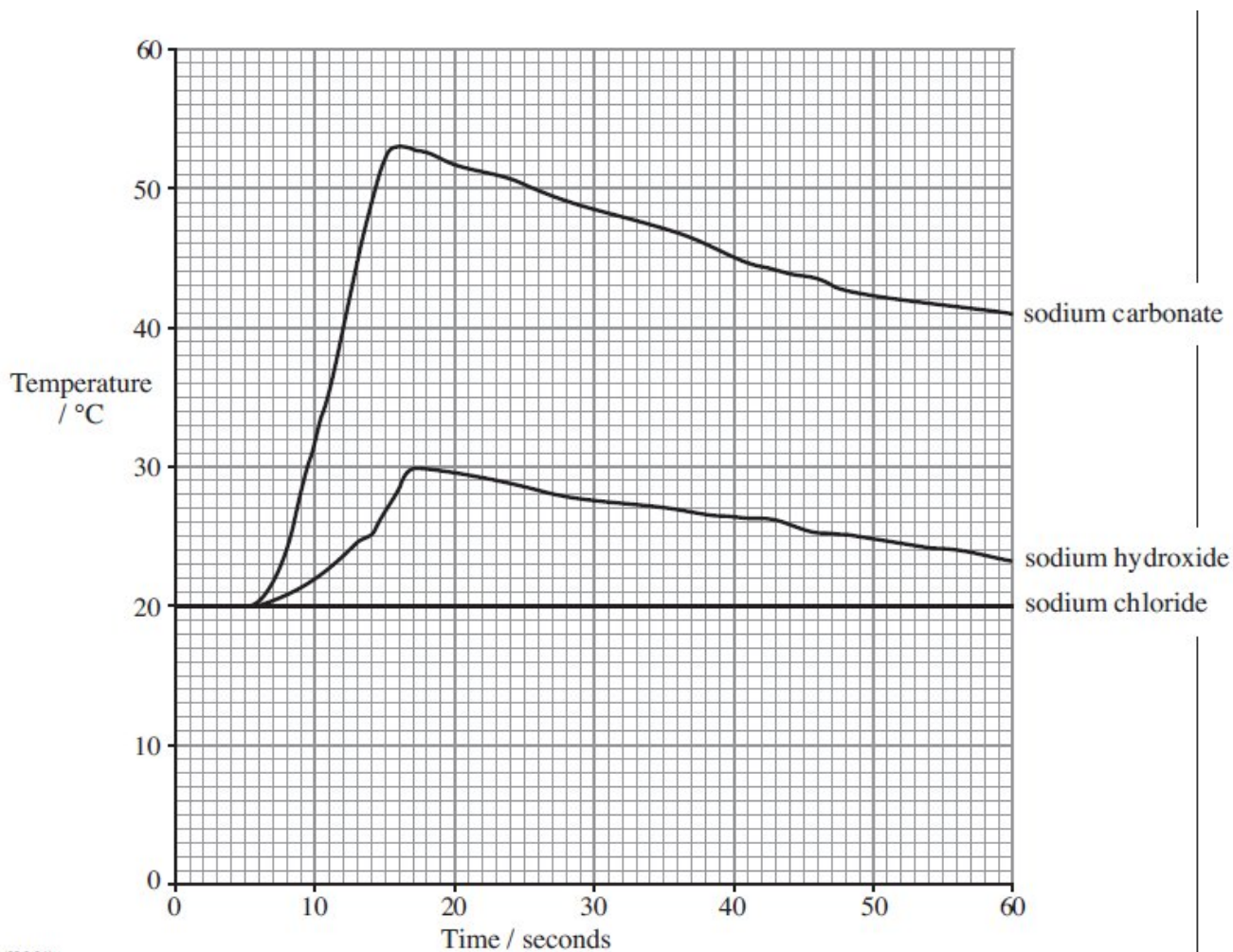
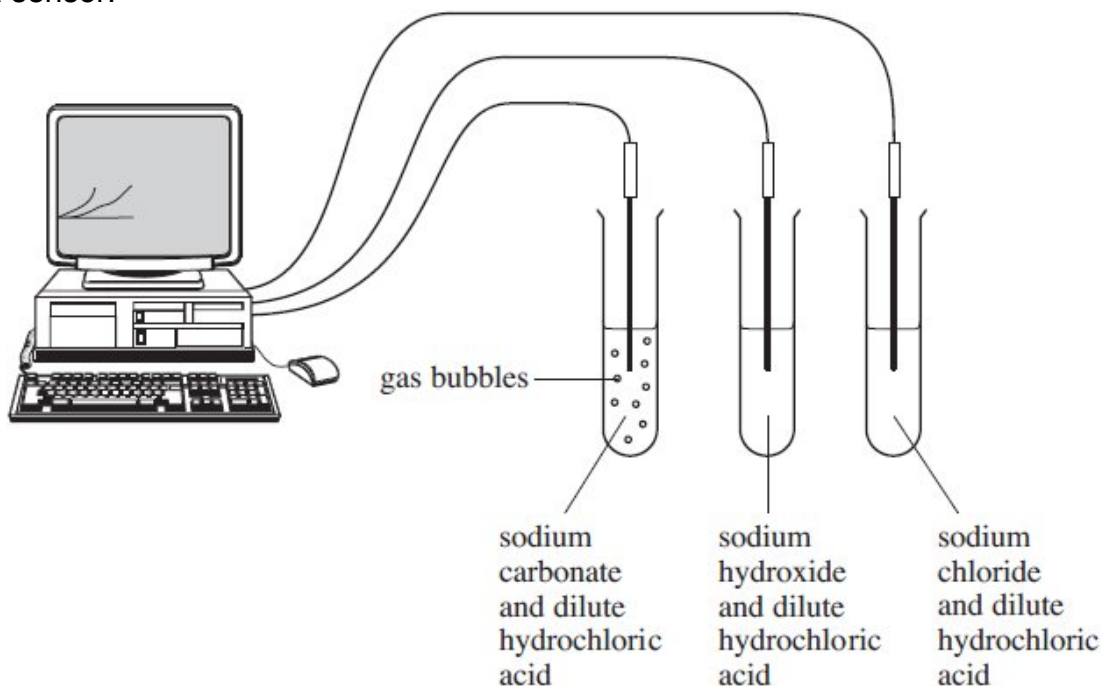
Give the name for  
a) colourless solution **A**.....[1]f/h

b) gas **B** .....[1]f/h

c) alkali **C** .....[1]f/h

d) green powder **D** .....[1]f/h

4) The apparatus below was used to investigate the reaction of dilute hydrochloric acid with solutions of sodium carbonate, sodium hydroxide and sodium chloride. 20 cm<sup>3</sup> of dilute hydrochloric acid was added to equal volumes and concentrations of sodium carbonate, sodium hydroxide and sodium chloride. The temperature of the three mixtures was recorded using a sensor.



a) Use the graphs to give the **maximum increase** in temperature, **if any**, during the reaction between dilute hydrochloric acid and:

i) sodium hydroxide solution ..... °C [1]f/h

ii) sodium chloride solution ..... °C [1]f/h

ii) sodium carbonate solution ..... °C [1]f/h

b) Using the information from the diagram and the graph for sodium carbonate, state **two** pieces of evidence which indicate that a chemical reaction takes place between sodium carbonate and dilute hydrochloric acid. [2]f/h

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c) State how this experiment was made a fair test. [2]f/h

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5) Calcium carbonate reacts with hydrochloric acid to produce calcium chloride, carbon dioxide and water. Write a balanced **symbol** equation for the reaction. The following ions may help you. [3]h

Positive ions		Negative ions	
Name	Formula	Name	Formula
Calcium	Ca <sup>2+</sup>	Chloride	Cl <sup>-</sup>
Hydrogen	H <sup>+</sup>	Carbonate	CO <sub>3</sub> <sup>2-</sup>

..... + ..... → ..... + ..... + .....

6) A technician found that the labels had come off some containers of metals. She thought that they contained magnesium, silver and iron, but she wasn't sure which was which. Describe how she could use dilute hydrochloric acid to identify each metal. Include the expected observations for each metal and explain these observations. [5]h

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