

Identification of Common Gases

Question Paper

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Chemistry
Exam Board	AQA
Topic	5.8 Chemical Analysis
Sub-Topic	Identification of Common Gases
Difficulty Level	Gold Level
Booklet	Question Paper

Time Allowed: 17 minutes

Score: /17

Percentage: /100

Grade Boundaries:

Q1. Limestone is used as a building material. Acid rain erodes limestone.

- (a) Limestone contains calcium carbonate.
The symbol equation for the reaction of calcium carbonate with hydrochloric acid is shown.



Describe a test to show that carbon dioxide is produced in this reaction.

Give the result of the test.

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(2)

- (b) Gases from vehicle exhausts produce sulfuric acid and nitric acid.

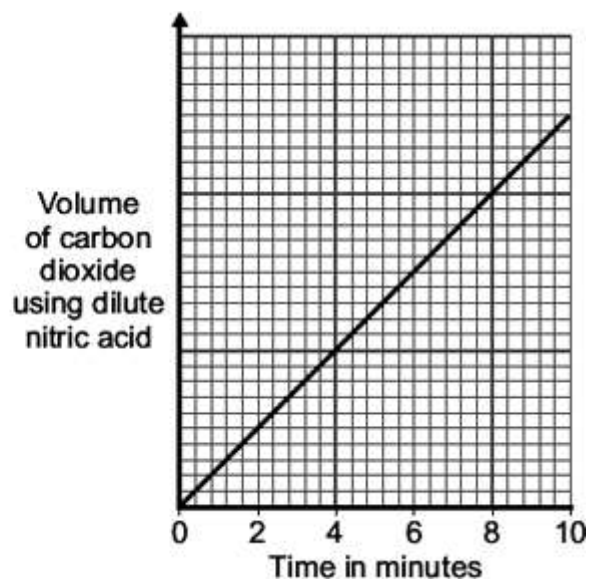
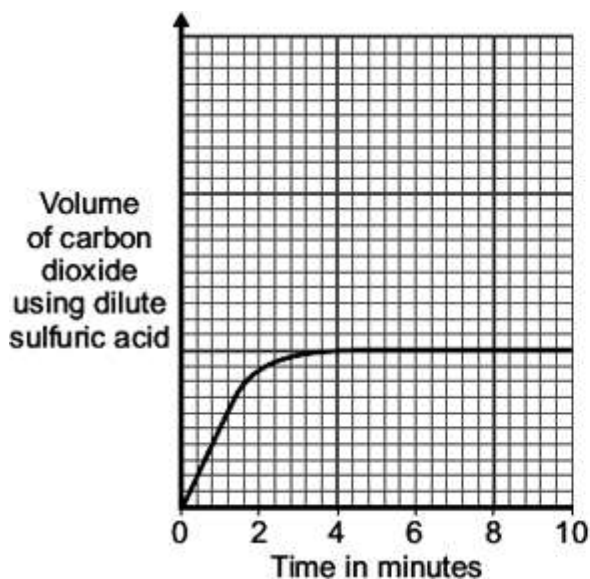
A student investigated the reaction of these two acids with calcium carbonate (limestone).

The type of acid was changed but all other variables were kept the same.

The student measured the volume of carbon dioxide produced each minute for a total of 10 minutes. He did this first for the reaction between dilute sulfuric acid and a cube of calcium carbonate (limestone).

The student repeated the experiment using dilute nitric acid in place of the dilute sulfuric acid.

The results are shown below.



- (i) State **two** variables that must be kept the same for this investigation.

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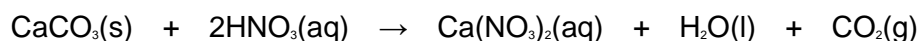
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(2)

- (i) Reacting calcium carbonate with sulfuric acid gave different results to nitric acid.

The symbol equations for the reaction of calcium carbonate with sulfuric acid and with nitric acid are shown below.



Describe how the results for sulfuric acid are different **and** use the symbol equations to explain this difference.

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(3)
(Total 7 marks)

Q2. Acids and bases are commonly found around the home.

(a) Baking powder contains sodium hydrogencarbonate mixed with an acid.

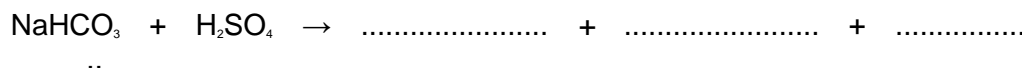
(i) When water is added, the baking powder releases carbon dioxide. How could you test the gas to show that it is carbon dioxide?

Test

Result of test

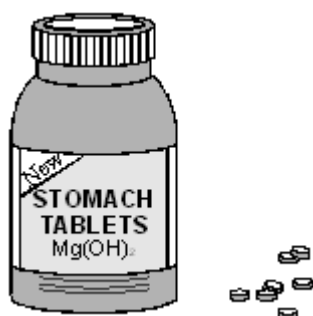
(2)

(ii) Complete and balance the chemical equation for the reaction of sodium hydrogencarbonate with sulphuric acid.

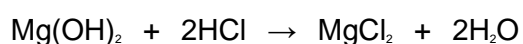


(2)

(b) Indigestion tablets contain bases which cure indigestion by neutralising excess stomach acid.



(i) One type of indigestion tablet contains magnesium hydroxide. This base neutralises stomach acid as shown by the balanced chemical equation.



Write a balanced **ionic** equation for the neutralisation reaction.

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(2)

(ii) How does the pH in the stomach change after taking the tablets?

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(1)

(c) Ammonium sulphate is used as a lawn fertiliser.



Using ammonia solution, describe how you would make the fertiliser ammonium sulphate.

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(3)

(Total 10 marks)