Volumes of gases

Chemistry calculations | AQA GCSE Chemistry 8462 only (not Combined Science) | 12 questions, 30 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- volume of gas (dm^3) = moles × 24 learn this one
- moles = $\frac{\text{mass (g)}}{\text{Mr}}$ learn this one
- gas volumes react in the same ratio as the moles in the balanced equation learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 30**

1 **Higher tier**

A balloon is filled with 0.50 mol of carbon dioxide at room temperature and pressure.

Calculate the volume of the carbon dioxide in dm^3.

(1 mark)

Answer _____

2 **Higher tier**

A small oxygen cylinder used by a paramedic releases 2.5 mol of oxygen.

Calculate the volume of this oxygen at room temperature and pressure, in dm^3.

(1 mark)

Answer _____

3 **Higher tier**

In an electrolysis experiment, 0.040 mol of hydrogen gas is collected at room temperature and pressure.

Calculate the volume of hydrogen in dm^3.

(1 mark)

Answer _____

4 **Higher tier**

Ewan collects 0.00350 mol of a gas in a gas syringe at room temperature and pressure.

Calculate the volume of gas in the syringe in cm^3.

(2 marks)

Answer _____

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5 **Higher tier**

A fizzy drinks factory in Bristol measures 480 cm^3 of carbon dioxide escaping from a bottle at room temperature and pressure.

Calculate the number of moles of carbon dioxide.

(2 marks)

Answer _____

6 **Higher tier**

A block of dry ice contains 8.8 g of carbon dioxide, CO_2.

Relative atomic masses (A_r): C = 12, O = 16

Calculate the volume of the carbon dioxide gas when all of the dry ice has turned to gas at room temperature and pressure.

(3 marks)

Answer _____

7 **Higher tier**

A food packaging line fills a crisp bag with 6.0 dm^3 of nitrogen at room temperature and pressure.

Calculate the number of moles of nitrogen in the bag.

(2 marks)

Answer _____

8 **Higher tier**

Fatima collects 1.8 dm^3 of oxygen, O_2, at room temperature and pressure.

Relative atomic mass (A_r): O = 16

Calculate the mass of oxygen she collects.

(3 marks)

Answer _____

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9 **Higher tier**

A small piece of zinc reacts with acid and gives off 90 cm^3 of hydrogen at room temperature and pressure.

Calculate the number of moles of hydrogen. Give your answer in standard form.

(3 marks)

Answer _____

10 **Higher tier**

A camping stove burns butane gas.

$2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$

All volumes are measured at room temperature and pressure, where water is a liquid.

a. Calculate the volume of oxygen needed to burn 40 cm^3 of butane completely.

b. Calculate the volume of gas produced when 40 cm^3 of butane burns completely. Show your working.

(3 marks)

Answer _____

11 **Higher tier**

Ms Kowalski adds a catalyst to 1.7 g of hydrogen peroxide, H_2O_2, dissolved in 50 cm^3 of water. All of the hydrogen peroxide decomposes.

$2H_2O_2 \rightarrow 2H_2O + O_2$

Relative atomic masses (A_r): H = 1, O = 16

Calculate the volume of oxygen produced at room temperature and pressure, in cm^3. Show your working.

(4 marks)

Answer _____

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12 **Higher tier**

Kwame heats some calcium carbonate in a crucible until it has all decomposed.

- Mass of the empty crucible = 32.40 g
- Mass of the crucible and calcium carbonate = 38.60 g

$CaCO_3 \rightarrow CaO + CO_2$

Relative atomic masses (A_r): C = 12, O = 16, Ca = 40

Calculate the volume of carbon dioxide given off at room temperature and pressure, in dm^3.

Give your answer to 2 significant figures. Show your working.

(5 marks)

Answer _____

End of questions | Total 30 marks

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