# Unit 2: Atoms, molecules and stoichiometry

## Subunit 2.4: Reacting masses and volumes (solutions and gases)

*Topical Question No: 1*

**17** In an experiment, 0.600 mol of chlorine gas, $Cl_2$, is reacted with an excess of hot aqueous sodium hydroxide. One of the products is $NaClO_3$.

Which mass of $NaClO_3$ is formed?

**A** 21.3 g **B** 44.7 g **C** 63.9 g **D** 128 g

*Topical Question No: 2*

**6** Sodium hydroxide neutralises acid.

$$H^+ + OH^- \rightarrow H_2O$$

In a 11 000 $dm^3$ sample of an aqueous solution, the concentration of acid, $[H^+]$, is $1.26 \times 10^{-3}$ mol $dm^{-3}$.

Which mass of solid sodium hydroxide neutralises the acid?

**A** 0.0214 g **B** 0.0504 g **C** 236 g **D** 554 g

*Topical Question No: 3*

**25** Which volume of hydrogen, measured under room conditions, is produced when 0.160 g of methanol reacts with an excess of sodium?

**A** 60 $cm^3$ **B** 120 $cm^3$ **C** 240 $cm^3$ **D** 480 $cm^3$

*Topical Question No: 4*

**2** A 3.7 g sample of copper(II) carbonate is added to 25 $cm^3$ of 2.0 mol $dm^{-3}$ hydrochloric acid.

Which volume of gas is produced under room conditions?

**A** 0.60 $dm^3$ **B** 0.72 $dm^3$ **C** 1.20 $dm^3$ **D** 2.40 $dm^3$

*Topical Question No: 5*

**27** *Use of the Data Booklet is relevant to this question.*

Which volume of oxygen, at room temperature and pressure, is needed for complete combustion of 0.1 mol of ethanol?

**A** 7.2 $dm^3$ **B** 8.4 $dm^3$ **C** 14.4 $dm^3$ **D** 16.8 $dm^3$

## *Topical Question No: 6*

**18** *Use of the Data Booklet is relevant to this question.*

A chemist took 2.00 $dm^3$ of nitrogen gas, measured under room conditions, and reacted it with a large volume of hydrogen gas, in order to produce ammonia. Only 15.0% of the nitrogen gas reacted to produce ammonia.

What mass of ammonia was formed?

**A** 0.213 g **B** 0.425 g **C** 1.42 g **D** 2.83 g

## *Topical Question No: 7*

**9** *Use of the Data Booklet is relevant to this question.*

In an experiment, 12.0 $dm^3$ of oxygen, measured under room conditions, is used to burn completely 0.10 mol of propan-1-ol.

What is the final volume of gas, measured under room conditions?

**A** 7.20 $dm^3$ **B** 8.40 $dm^3$ **C** 16.8 $dm^3$ **D** 18.00 $dm^3$

# Answer Key

1. Error
2. Error
3. Error
4. Error
5. Error
6. Error
7. Error