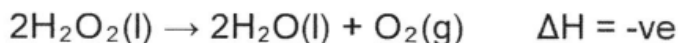


## O Level Pure Chemistry MCQs

### The Mole Concept and Stoichiometry Test 4.0

Q1

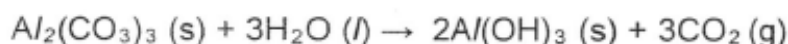
Which of the following can be deduced from the equation below?



- A Addition of a catalyst speeds up the reaction.
- B Heat is taken in during the reaction.
- C The volume of oxygen produced from 200 cm<sup>3</sup> of aqueous hydrogen peroxide is 100 cm<sup>3</sup>.
- D When completely decomposed, 17g of hydrogen peroxide forms 9g of water and 8g of oxygen.

Q2

Aluminium carbonate is an unstable compound, which decomposes readily to aluminium hydroxide and carbon dioxide.



What is the percentage purity of a sample of impure aluminium carbonate if 351 g of the sample produces 36 dm<sup>3</sup> of carbon dioxide?

( $M_r$  of  $\text{Al}_2(\text{CO}_3)_3 = 234$ ,  $M_r$  of  $\text{CO}_2 = 44$ )

- A 13.6%
- B 33.3%
- C 54.5%
- D 100.0%

Q3

Which of the information below is required to determine the empirical formula and molecular formula of a compound?

- 1 density of the compound
- 2 percentage composition of the compound
- 3 relative molecular mass of the compound

- A 1 only
- B 1 and 2
- C 2 and 3
- D 1, 2, and 3

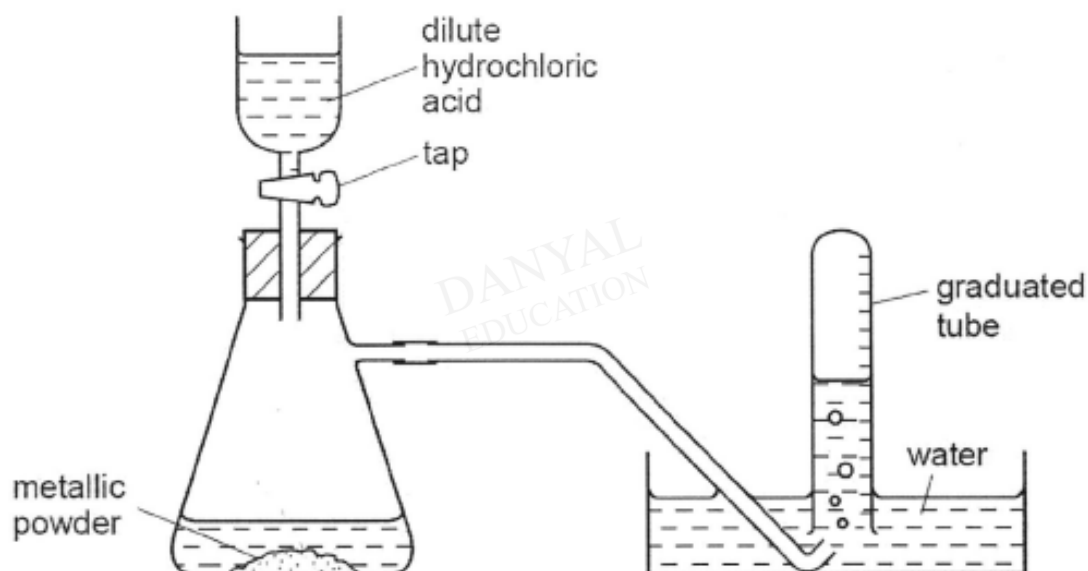
Q4

Which substance has the highest percentage by mass of nitrogen?

- A  $\text{CO}(\text{NH}_2)_2$   $M_r = 60$   
 B  $\text{NH}_4\text{NO}_3$   $M_r = 80$   
 C  $(\text{NH}_4)_2\text{SO}_4$   $M_r = 132$   
 D  $(\text{NH}_4)_3\text{PO}_4$   $M_r = 149$

Q5

The diagram below shows apparatus used to measure the volume of hydrogen given off when an excess of dilute hydrochloric acid is added to powdered metal. The volume of gas is measured at room temperature and pressure.



The experiment is carried out three times, using the same mass of powder each time but with different powders:

- pure calcium
- pure magnesium
- a mixture of calcium and magnesium

Which powder gives the greatest volume of hydrogen and which the least volume?

	greatest volume of $\text{H}_2$	least volume of $\text{H}_2$
A	pure calcium	pure magnesium
B	pure calcium	the mixture of calcium and magnesium
C	pure magnesium	pure calcium
D	pure magnesium	the mixture of calcium and magnesium

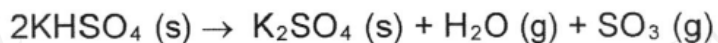
Q6

The compound  $S_2O_7$  reacts with water to produce sulfuric acid and oxygen only. What volume of oxygen, measured at room temperature and pressure, is evolved when 0.704 g of  $S_2O_7$  is reacted?

- A 48 cm<sup>3</sup>      B 96 cm<sup>3</sup>      C 192 cm<sup>3</sup>      D 384 cm<sup>3</sup>

Q7

When solid potassium hydrogen sulfate ( $KHSO_4$ ) is heated strongly, the following reaction occurs:



What is the loss in mass when 20.4 g of solid potassium hydrogen sulfate is heated?

- A 1.35 g      B 6.00 g      C 7.35 g      D 13.10 g

Q8

Deuterium is an isotope of hydrogen and has the symbol D. Which formula is incorrect for a deuterium compound?

- A BaOD  
B  $CD_3CO_2D$   
C  $C_2D_4Br_2$   
D  $D_2O_2$

Q9

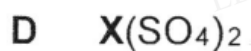
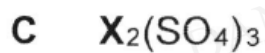
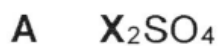
Naturally occurring iridium has a relative atomic mass of 192.2 and consists of two isotopes,  $^{191}_{77}Ir$  and  $^{193}_{77}Ir$ . The percentage of the lighter isotope is

- A 80%  
B 60%  
C 40%  
D 20%

Q10

20 cm<sup>3</sup> of an aqueous 1.0 mol/dm<sup>3</sup> solution of the hydroxide of metal X, exactly neutralises 40 cm<sup>3</sup> of aqueous 0.5 mol/dm<sup>3</sup> sulfuric acid.

What is the formula for the sulfate of X?



**Answers**

**The Mole Concept and Stoichiometry Test 4.0**

Q1 D

Q2 B

Q3 C

Q4 A

Q5 C

Q6 A

Q7 C

Q8 A

Q9 C

Q10 B

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