



Quantitative Chemistry

Multiple Choice Questions

Set 3

Tick **one** box.

1. Nitric acid contains one atom of hydrogen, one atom of nitrogen and three atoms of oxygen. What is the chemical formula for nitric acid?

A. HNO_3 ☐

B. $\text{H}(\text{NO})_3$ ☐

C. NOH_3 ☐

D. N_3OH ☐

2. What is the correctly balanced symbol equation for the reaction between iron and hydrochloric acid?

A. $\text{Fe} + \text{HCl} \rightarrow \text{FeCl}_2 + 2\text{H}_2$ ☐

B. $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$ ☐

C. $2\text{Fe} + \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$ ☐

D. $4\text{Fe} + \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$ ☐

3. 1.2g of sodium chloride is formed from 0.5g of sodium. What is the mass of chlorine that reacts?

A. 0.6g ☐

B. 0.7g ☐

C. 1.2g ☐

D. 1.7g ☐

4. What is the relative formula mass of sodium carbonate (Na_2CO_3)? Relative atomic masses (A_r): Na = 23, C = 12, O = 16

A. 51 ☐

B. 83 ☐

C. 106 ☐

D. 130 ☐

5. What is the concentration of a solution containing 45g of solute dissolved in 20dm^3 of solvent?

A. 0.44g/dm^3 ☐

B. 2.25g/dm^3 ☐

C. 65g/dm^3 ☐

D. 900g/dm^3 ☐

6. A solution has a concentration of 4.8g/dm^3 . What mass of solute is dissolved in 2.5dm^3 of the solution?

A. 0.52g ☐

B. 1.92g ☐

C. 4.8g ☐

D. 12g ☐

7. What is percentage yield? **(Chemistry Only)**

A. the amount of a product obtained as a percentage of the maximum theoretical mass of the product ☐

B. the percentage of starting materials in a chemical reaction that end up as useful products ☐

C. the relative atomic mass of an element in a compound as a percentage of the relative formula mass of the compound ☐

D. the percentage of substances produced in a chemical reaction that are soluble in water ☐

8. A student calculated that 3.00g of magnesium oxide would be produced in a reaction between magnesium and oxygen. The actual yield of magnesium oxide was 0.96g . What was the percentage yield? **(Chemistry Only)**

A. 0.32% ☐

B. 7.5% ☐

C. 32% ☐

D. 68% ☐

9. What is atom economy? **(Chemistry Only)**

A. the relative cost of carrying out a chemical reaction in terms of energy ☐

B. the number of atoms that must be put into a chemical reaction to make carrying out the reaction worthwhile ☐

C. a measure of the amount of starting materials in a chemical reaction that end up as useful products ☐

D. the number of atoms of a particular element present in a compound as a proportion of the total number of atoms in the compound ☐

10. The symbol equation for the reaction between magnesium carbonate and sulfuric acid is $\text{Mg} + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2$. What is the atom economy of this reaction to produce magnesium sulfate? **(Chemistry Only)**

Relative formula masses (M_r): $\text{Mg} = 24$, $\text{H}_2\text{SO}_4 = 98$, $\text{MgSO}_4 = 120$, $\text{H}_2 = 2$

- A. 1.6% ☐
- B. 20% ☐
- C. 82% ☐
- D. 98% ☐