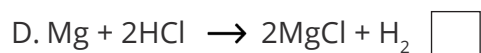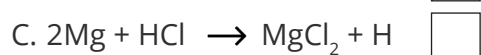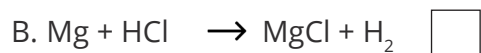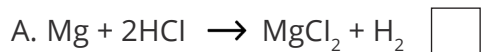# Quantitative Chemistry
Multiple Choice Questions

Set 1

Tick **one** box.

1. What is the correctly balanced symbol equation for the reaction between magnesium and hydrochloric acid?

    A. $Mg + 2HCl \longrightarrow MgCl_2 + H_2$ ☐

    B. $Mg + HCl \longrightarrow MgCl + H_2$ ☐

    C. $2Mg + HCl \longrightarrow MgCl_2 + H$ ☐

    D. $Mg + 2HCl \longrightarrow 2MgCl + H_2$ ☐

2. What is the relative formula mass of dibromoethane ($C_2H_4Br_2$)?
    Relative atomic masses (A_r): C = 12, H = 1, Br = 80

    A. 93 ☐

    B. 186 ☐

    C. 188 ☐

    D. 372 ☐

3. Which statement about moles is **not** true?

    A. all substances contain the same number of moles ☐

    B. one mole of carbon contains 6.02×10^{23} atoms of carbon ☐

    C. the mass of one mole of a substance in grams is numerically equal to the relative formula mass of that substance ☐

    D. the number of atoms, molecules or ions in one mole of a substance is the Avogadro constant ☐

4. What is the mass of two moles of rubidium?
    Relative atomic mass (A_r) = 85

    A. 42.5g ☐

    B. 85g ☐

    C. 127.5g ☐

    D. 170g ☐

5. How many moles are there in 22g of carbon dioxide (CO_2)?
    Relative atomic masses (A_r): C = 12, O = 16

    A. 0.5 ☐

    B. 2 ☐

    C. 12 ☐

    D. 968 ☐

6. The balanced symbol equation for the reaction between lithium and fluorine is $2Li + F_2 \longrightarrow 2LiF$. If three moles of lithium react completely with fluorine, how many moles of lithium fluoride are produced?

   A. 1 ☐

   B. 2 ☐

   C. 3 ☐

   D. 6 ☐

7. The symbol equation for the thermal decomposition of calcium carbonate is $CaCO_3 \longrightarrow CaO + CO_2$. What is the mass of calcium oxide produced from 2.5g of calcium carbonate?
   Relative atomic masses (A_r): Ca = 40, C = 12, O = 16

   A. 1.4g ☐

   B. 2.5g ☐

   C. 2.8g ☐

   D. 5.6g ☐

8. What is a limiting reactant?

   A. a substance that slows down the rate of a chemical reaction ☐

   B. the reactant in a chemical reaction that is completely used up and therefore limits the amount of product formed ☐

   C. the reactant in a chemical reaction that is present in a larger amount than is needed ☐

   D. a reactant that is not used up in a chemical reaction ☐

9. Sodium hydrogen carbonate has the chemical formula $NaHCO_3$. What is the percentage by mass of oxygen in sodium hydrogen carbonate?
   Relative atomic masses (A_r): Na = 23, H = 1, C = 12, O = 16

   A. 19% ☐

   B. 36% ☐

   C. 57% ☐

   D. 68% ☐

10. What mass of sodium chloride is dissolved in 100cm³ of water to make a salt solution with a concentration of 40g/dm³?

   A. 0.4g ☐

   B. 4g ☐

   C. 40g ☐

   D. 400g ☐