

# Mole Concept and Stoichiometry

Chapter 5: Mole Concept and Stoichiometry · Topic 1

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## Key Concept

One mole of any substance contains  $6.022 \times 10^{23}$  particles (Avogadro's number), whether atoms, molecules, or ions.

Molar mass is the mass of one mole of a substance in grams, numerically equal to its atomic or molecular mass.

At STP (standard temperature and pressure), one mole of any gas occupies 22.4 litres, known as molar volume.

Stoichiometry uses balanced chemical equations to calculate the amounts of reactants and products involved in a reaction.

## Quick Revision Notes

- 1 mole =  $6.022 \times 10^{23}$  particles (Avogadro's number).
- Molar mass = mass of 1 mole in grams.
- It equals atomic/molecular mass numerically.
- At STP, 1 mole of gas = 22.4 litres.
- This is called molar volume.
- Stoichiometry uses balanced equations.
- It calculates reactant/product amounts.
- Practice builds mole calculation skills.

## Practice Questions

- 1 Calculate the number of moles in 44g of  $\text{CO}_2$ .
- 2 Calculate the mass of 2 moles of water.
- 3 Calculate the volume occupied by 0.5 moles of a gas at STP.
- 4 Solve a stoichiometry problem using a balanced equation.
- 5 Discuss the significance of Avogadro's number.
- 6 Explain the mole concept in your own words.