

Balancing Chemical Equations

Chapter 1: Chemical Reactions and Equations · Topic 2

Key Concept

For example, the unbalanced equation $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$ has 2 hydrogen and 2 oxygen atoms on the left but only 2 hydrogen and 1 oxygen atom on the right; balancing it correctly gives $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$, with 4 hydrogen and 2 oxygen atoms on both sides. Balancing equations is essential for accurately predicting the quantities of reactants needed and products formed in a reaction, a skill crucial for stoichiometry calculations in chemistry.

Quick Revision Notes

- A balanced equation has equal atoms of each element on both sides.
- Balancing uses coefficients (numbers before formulas), never changing subscripts.
- Example: $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ is the balanced form of the water-forming reaction.
- Balanced equations are essential for stoichiometry calculations of reactant/product amounts.

Practice Questions

- 1 Balance the equation: $\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$.
- 2 Explain why we cannot change subscripts while balancing an equation.
- 3 Why is balancing chemical equations important for stoichiometry?