

Atoms, Molecules and Atomic Mass

Chapter 3: Atoms and Molecules · Topic 2

Key Concept

Molecular mass is calculated by adding up the atomic masses of all atoms present in a molecule — for example, the molecular mass of water (H_2O) is calculated as $(2 \times 1) + 16 = 18\text{u}$, using hydrogen's atomic mass of 1u and oxygen's atomic mass of 16u . Avogadro's number (approximately 6.022×10^{23}) represents the number of particles (atoms or molecules) present in one mole of any substance, a crucial concept for calculating quantities in chemical reactions.

Quick Revision Notes

- An atom is the smallest particle of an element; a molecule forms when atoms combine chemically.
- Atomic mass is measured in atomic mass units (u), based on carbon-12 as the reference.
- Molecular mass = sum of atomic masses of all atoms in the molecule (e.g., water = 18u).
- Avogadro's number (6.022×10^{23}) is the number of particles in one mole of a substance.

Practice Questions

- 1 Define atomic mass unit (u).
- 2 Calculate the molecular mass of carbon dioxide (CO_2), given carbon's atomic mass is 12u and oxygen's is 16u .
- 3 Explain the significance of Avogadro's number in chemistry.