

Stoichiometry

Formulas of Simple Compounds

- **Valency:** The number of electrons an atom needs to gain or lose to achieve a full outer shell.
- Determine valencies from the periodic table.
- Write formulas by swapping valencies and canceling if necessary.

Writing Equations

- **Word equations:** Represent reactions using words.
- **Symbol equations:** Represent reactions using chemical symbols.
 - Balance equations to ensure equal numbers of atoms on both sides.
 - Use state symbols to indicate physical states (s, l, g, aq).

Calculations

Moles and Masses

- **Relative formula mass (Mr):** Sum of relative atomic masses (Ar).
- **Moles:** 1 mole = 6.02×10^{23} particles.
- **Mass of one mole:** Equal to Mr.

Moles and Volumes

- **Volume of one mole of gas at RTP:** 24 dm³.

Moles and Concentrations

- **Concentration:** Moles per unit volume (mol/dm³).
- Use the formula: moles = concentration x volume.

% Yield

- **Theoretical yield:** Calculated amount of product.

- **Actual yield:** Amount of product actually produced.
- **% yield:** $(\text{Actual yield} / \text{Theoretical yield}) \times 100$.

% Purity

- **% purity:** $(\text{Mass of pure substance} / \text{Mass of impure sample}) \times 100$.

Empirical and Molecular Formulas

- **Empirical formula:** Simplest whole-number ratio of atoms in a compound.
- **Molecular formula:** Actual number of atoms in a molecule.
- Determine empirical formula from % composition.
- Calculate molecular formula using M_r and empirical formula mass.

Remember:

- Practice balancing equations and solving stoichiometry problems.
- Use the provided formulas and equations as a reference.
- Pay attention to units and conversions.