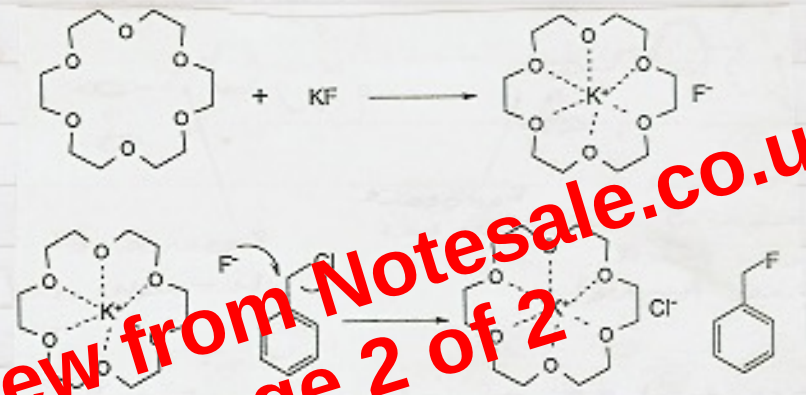
Crown Ethers as Phase Transfer Agents

Principles: - Crown ethers can solubilize metal salts in non-polar solvents → Phase transfer from aqueous to non-aqueous.

- Separation of anion from crown ether encapsulated cation increases anion reactivity:

(i) As a nucleophile e.g. KF

(ii) As a redox agent e.g. $KMnO_4$ in aromatic solvents which cannot solvate and stabilise MnO_4^- ion.



Molecular Sensors: Principles

Definition: A receptor (host) molecule can report the presence of the guest via a physical technique - spectroscopic change.

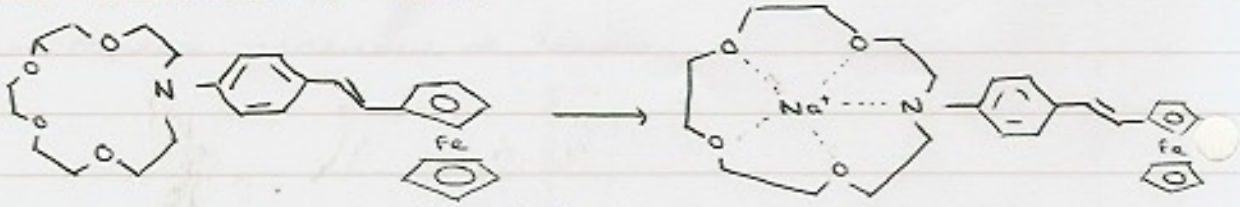
Important properties: - Selectivity for specific guest.

- Quantitative determination of guest concentration.

Design Strategy: - Combine binding site + reporter group in a single molecule.

- Reporter group has electrochemical/spectroscopic properties which are altered by host-guest interaction.

EXAMPLE: Electrochemical Sensor



Ferrocene has reversible Fe(II)/Fe(III) redox couple.

- redox potential changed by binding of Na^+."