Organic Chemistry - Short Notes (Q&A)

Notebook ke questions (Unit 8), short simple English answers

Q1. Explain the following: (a) Fractional Distillation (b) Chromatography

Ans: Fractional Distillation: Used to separate two miscible liquids whose boiling points are close. The mixture is heated in a fractionating column, where the vapour repeatedly condenses and vaporises, so the lower-boiling liquid comes out first and is collected. Example: ethanol (78 °C) and water (100 °C).
Chromatography: Separates the components of a mixture as they move at different speeds with a solvent over a fixed surface (e.g. paper). Each component travels a different distance, so the spots separate. Example: separating the colours in ink. Rf = distance moved by the component ÷ distance moved by the solvent.

Q2. What do you mean by nucleophilic and electrophilic reagent? Explain them with the help of types and suitable examples.

Ans: Nucleophile (nucleus-loving): an electron-rich reagent that attacks an electron-poor (positive) centre. Types: negatively charged - OH^-, CN^-, Cl^-; neutral with a lone pair - NH_3, H_2O.
Electrophile (electron-loving): an electron-poor reagent that accepts an electron pair. Types: positively charged - H^+, NO_2^+, carbocations like CH_3^+; neutral electron-deficient - BF_3, $AlCl_3$.

Q3. Write the difference between Inductive effect and Electromeric effect.

Ans: Inductive effect: a permanent, partial shift of sigma (σ) electrons along the chain, caused by an electronegative atom or group (e.g. Cl); no reagent needed; weakens with distance.
Electromeric effect: a temporary, complete transfer of a pi (π) electron pair to one atom, only when an attacking reagent comes close; seen in unsaturated compounds.
In short: inductive = permanent, sigma, partial; electromeric = temporary, pi, complete, reagent needed.

Q4. Explain the following: (a) Free radical (Homolytic cleavage) (b) Resonance

Ans: Free radical (Homolytic cleavage): the shared electron pair splits equally, one electron going to each atom. The neutral species formed, with one unpaired electron, is a free radical. Example: Cl_2 in sunlight gives two Cl free radicals.
Resonance: when one structure cannot explain all properties of a molecule, two or more structures are drawn that differ only in the arrangement of electrons, not of atoms; the real structure is their resonance hybrid. Example: benzene.

> Questions notebook se liye gaye hain (spelling corrected; Unit 8 only, Unit 6 shamil nahi). Ye official NCERT solutions nahi, hamare apne notes hain.