

# AMPTE04 ORGANIC CHEMISTRY AND TECHNOLOGY

## UNIT-1 STRUCTURE REACTIVITY AND MECHANISM

- 1.1 Classification and IUPAC Nomenclature of organic compounds,
- 1.2 Functional groups, classification and reactions, bonding in organic molecules
- 1.3 Hybridization - Methane, ethylene, acetylene, and butadiene.
- 1.4 Polarity of bonds-Hydrogen bonding- Dipole Moment - Electron displacement effect
- 1.5 Inductive- Electromeric- Conjugative - mesomeric and Resonance effects
- 1.6 Stereochemistry-General idea of optical and stereoisomerisms, geometrical isomerism-

## UNIT-2 TYPES OF BOND BREAKAGE

- 2.1 Homolysis and heterolysis, Types of reagents
- 2.2 Electrophiles and Nucleophiles, types of reactions- addition ( $>C=C<$ ,  $>C=O$ ) substitution
- 2.3 Electrophilic and Nucleophilic substitution- elimination and rearrangement reactions
- 2.4 Inter and Intra molecular rearrangement
- 2.5 Hoffman, Beckman, Benzidine rearrangements
- 2.6 General conditions and mechanism of each of the above.

## UNIT-3 NATURAL GAS & SYNTHESIS GAS

- 3.1 Petroleum and petroleum products
- 3.2 Coal and coal products Cellulose and cellulose products.
- 3.3 Synthesis, properties and uses of Ethylene- Propylene
- 3.4 Butadiene- Vinyl chloride - Vinylidene chloride
- 3.5 Vinyl fluoride - Vinylidene fluoride - Vinyl acetate.

## UNIT-4 SYNTHESIS AND MANUFACTURING

- 4.1 Properties and uses of - Formaldehyde
- 4.2 Epichlorohydrin- Ethylene oxide - Propylene oxide
- 4.3 Ethylene glycol, Propylene glycol – Phenols – Aniline Bisphenol-A, Phthalic acid -
- 4.4 Adipic acid - Maleic acid - Maleic anhydride
- 4.5 Phthalic anhydride,  $\xi$ -caprolactam,  $\xi$ -Caprolactone

## UNIT-5 SYNTHESIS

- 5.1 Properties and uses of Styrene- Hexamethylene diamine- Urea
- 5.2 Acrylic acid - Methacrylic acid- Acrylonitrile- Methyl methacrylate
- 5.3 Toluene diisocyanate (TDI) Hexamethylene diisocyanate (HMDI)
- 5.4 Diphenyl methane diisocyanate (MDI)-Pyrrole, Furan- Thiophene- benzimidazoles, Oxazoles.

## References Books:

1. I.L.Finar, "Textbook of Organic Chemistry", ELBS, 5th edition, 1996.
2. Jerry March, "Advanced Organic Chemistry", John Wiley & Sons, New York, 1992.
3. A.Brydson, "Plastics materials", Butterworth - Heinemann - Oxford, 1995. K.J. Saunders, "Organic Polymer Chemistry", Chapman and Hall Publishers