

B. PHARM PART-II

2.1 Pharmaceutical Chemistry-III (Organic Chemistry-II including Heterocyclic and Natural Products)

Theory

1. Aromaticity- Stability of benzene ring, Orbital picture of benzene, Huckel rule.
2. Electrophilic aromatic substitution-Effect of substituent groups, classification of substituent groups, Orientation in disubstituted benzene, mechanism of nitration, Sulfonation, Friedal-craft alkylation, Halogenation, porotation, Mechanism of electrophilic aromatic substitution.
3. Arenes and their derivaties- The aromatic ring as a substituent, aromatic-aliphatic hydrocarbon, structure and nomenclature of arenes and their derivatives, Friedel-craft alkylation, Mechanism and limitations, Reactions of alkyl benzene, Oxidation, Electrophilic aromatic substitution, Halogenation, side chain halogenations, Resonance stabilization of benzyl radical.
4. Nucleophilic aromatic substitution- Role of carbonyl group, Alkyl v/s acyl, Reaction of acid chlorides, acid anhydrides, amides & esters.
5. Nucleophilic aromatic substitution- Bimolecular displacement mechanism, Reactivity and orientation in nucleophilic aromatic substitution, Electron withdrawal by resonance, Nucleophilic substitution, Aliphatic and aromatic, Elimination-addition mechanism for nucleophilic aromatic substitution.
6. Structure, physical properties, Nomenclature, Preparation & properties of phenol, carboxylic acid, Amines, Nephthalene, Phenanthrene & anthrocene.
7. Heterocyclics- General nomenclature, occurrence and Pharmaceutical importance of the following heterocycles-Furan, Thiophene, Pyrrole, Oxazole, Imidazole, Isoxazole, Pyrazole, Pyrazine, Pyridine, Pyrimidine, Pyridazine, Indole, Benzofuran, Quinoline, Isoquinoline, Purine, Phenothiazine, Benzodiazepine.
8. Natural Products-
 - (a) Carbohydrates- Brief chemistry, classification and qualitative tests.
 - (b) Amino acids & proteins- Brief chemistry, classification and qualitative tests.
 - (c) Fats & Oils- Composition and Properties, determination & significance of acetyl value, acid value, saponification value & Iodine value.
 - (d) Alkaloids- brief chemistry (at least one from each group) and structure elucidation.
 - (e) Nucleic acid – Elementry knowledge.
 - (f) Terpenes- Classification & structure elucidation of one from each class.

PRACTICALS

1. Preparation of simple organic compounds involving Sulphonation, Nitration, Acetylation, Halogenations, Oxidation, Reduction (diazotization), Elimination.
2. Qualitative analysis of selected natural products- Alkaloids, Carbohydrates, Protiens, Amino acids & Tannins.
3. Analysis of essential oils & fats.

Books Recommended:

1. R.T. Morrison & R.N. Boyd, "Organic Chemistry", Prentice Hall of India Pvt. Ltd., New Delhi.
2. I.L. Finar, "Organic Chemistry", Vol. I & II, E.L. B. S., London.
3. F.G. Mann & B.C.Saunders, "Practical Organic Chemistry", Longmans, Green and Co. Ltd., London.
4. B.S. Furniss, et.al., "Vogel's Text Book of Practical Organic Chemistry" E.L. B. S., London.
5. Wingrove, A.S. & Caret, R.L. "Organic Chemistry", Harper & Row Publishers, New York.
6. R.M. Acheson " An Introduction to the Chemistry of Heterocyclic Compounds", Interscience Publications, New York.
7. Silverstein & Bassler, "Spectroscopic Identification of Organic Compounds".
8. Gutschi, "Chemistry of Carbonyl Compounds", Prentice Hall of India Pvt. Ltd., New Delhi.