

Core Course VIII : Organic Chemistry I

UNIT 1: CHEMISTRY OF CARBONYL COMPOUNDS :

Introduction - nomenclature - laboratory preparation of aliphatic carbonyl compounds - physical properties - chemical properties - uses - molecular orbital picture of carbonyl group - nucleophilic addition mechanism at carbonyl group - acidity of alpha - hydrogen - general methods of preparation of aromatic carbonyl compounds - physical and chemical properties - uses - effect of aryl group on the reactivity of carbonyl group.

UNIT 2: CHEMISTRY OF CARBOXYLIC ACIDS :

Nomenclature - general methods of preparation of carboxylic acids - physical properties - structure and acidity - Hammett equation - chemical properties - uses - preparation of dicarboxylic acid - physical and chemical properties - uses - Introduction to derivatives of carboxylic acids - physical and chemical properties - uses - Introduction to derivatives of carboxylic acids - nucleophilic substitution mechanism at acyl carbon - preparation, physical and chemical properties of the compound: acyl chlorides, anhydrides, esters, amides - chemistry of compounds containing active methylene group - Introduction to oils and fats - fatty acids - manufacture of soap - mechanism of cleaning action of soap.

UNIT 3: CHEMISTRY OF NITROGEN COMPOUNDS :

Nitrogen compounds - nomenclature - nitro alkanes - alkyl nitrites - differences - aromatic nitro compounds - preparation and reduction of nitro benzene under different conditions. Amino compounds - effect of substituents on basicity, reaction of amino compounds (primary, secondary, tertiary and quaternary amine compounds). mechanism of carbylamine reaction, diazotization, and comparison of aliphatic and aromatic amines - diazonium compounds - preparation and synthetic importance of diazomethane, benzene diazonium chloride and diazo acetic ester.

UNIT 4: CHEMISTRY OF HETEROCYCLIC COMPOUNDS :

Heterocyclic compounds - nomenclature - preparation and properties of furan, pyrrole, thiophen - comparison of the basicities of pyrrole, pyridine and piperidine with amines - synthesis and reactions of quinoline, isoquinoline and indole with special reference to Skraup, Fischer Napieraloki and Fischer - indole syntheses - structural elucidation of quinoline and isoquinoline.

UNIT 5: INDUSTRIAL ORGANIC CHEMISTRY :

Dyes - theory of color and constitution - chromophore, auxochrome, classification according to application and structure - preparation and uses of nitro dyes - naphthol yellow, nitroso fast green O, azo dyes - methyl orange, triphenyl methane dyes - malachite green, indigo dyes - Indigotin, anthraquinone dyes - alizarin, phthalein dyes - fluorescein - sulphonic acid

and derivatives - preparation and properties of benzene sulphonic acid - saccharin, chloramines - T, sulphonamides.

Polymers-definition-types of polymers-mechanism of cationic, anionic and free radical polymerisation -thermo setting polymers - preparation of caprolactam,

Nylon 66, polyester, epoxide resin- molecular weight of polymers (elementary treatment)

Book for Reference :

1. Finar I.L, Organic Chemistry, Vol 1&2, (6th edition) England, Addison Wesley. Longman Ltd. (1996)
2. Morrison R.T., Boyd R.N., Organic Chemistry, (6th edition) New York, Allyn & Bacon Ltd., (2006)
3. Bahl B.S, Arun Bahl, Advanced Organic Chemistry , (12th edition) New Delhi, Sultan Chand and Co., (1997).
4. Pines S.H., Organic Chemistry, (4th edition) New Delhi, Mc Graw - Hill International Book company .(1986)
5. Seyhan N. Ege., Organic Chemistry, New York, Houthton Mifflin Co., (2004)