

and catalysis, Supramolecular devices. 4hrs

**Pharmaco kinetics:** Introduction, Plasma concentration - time curve, protein binding and drugs, drug dissolution rate, pharmacokinetics applied to one compartment open model (calculation of elimination rate constant & metabolism constant). 4 hrs.

### References:

1. Solid state Chemistry, D. K. Chakrabarty (New Age) 1996.
2. Principles of the solid state, H.V.Keer( Wiley Eastern ) 1993.
3. Solid state chemistry and its applications, A.R.West (Wiley) 1984.
4. L.Smart and E. Moore, Solid State Chemistry –An Introduction (Chapman &Hall)1992.
1. V. Raghavan, Material science and Engineering (3<sup>rd</sup> Ed), (Prentice Hall India)1993.
6. Thermotropic Liquid Crystals, Ed. G.W. Gray, Wiley.
7. S.Chandrasekhar, Liquid Crystals, Cambridge University Press (2<sup>nd</sup>ed), 1994.
8. Basics of Nano Chemistry, Mamta V Sachdeva, Anmol Publishers, New Delhi. 2011.
9. Modern heterogeneous Oxidation Catalysis, Wd.NoritakaMiguno, Wiley, Weinheim, 2009
- 10.Nanoscale materials, Ed-L.M.Liz-Marzan and P.V.Kamath (Kulwer), 2003.
11. Introduction to Nanotechnology, C P Poole and F J Owens (Wiley Intersci), 2006.
12. Introduction to Petrochemicals, SukumarMaiti (Oxford & IBH, Delhi), 1992.

## AC S 554: Synthetic Polymers, Dyes and Pesticides

### COURSE OUTCOME:

Enable the students:

- To acquire detailed knowledge in classification and nomenclature of polymers, methods of polymerization,
- To study the mechanism and stereochemistry, properties, structure, synthesis and applications of synthetic polymers, polyesters, polyamides, phenol-formaldehyde, urea-formaldehyde and epoxy resins, polyurethanes, polycarbonates, synthetic rubber, manufacture and structural features of natural rubber and regenerated cellulose.
- To understand the modern theories of colour and constitution, classification of dyes, methods of applying dyes to the fabrics, Synthesis and applications of various types of azo dyes, triphenyl methane dyes, cyanin dyes, reactive dyes, optical brighteners and pigments.
- To gain knowledge about classification, mode of action and synthesis of several organophosphorous and organochlorine insecticides, natural pyrethroid insecticides, isolation and structure of natural pyrethrins, synthetic pyrethroids, Sythesis and uses of insect pheromones in pest control, fungicides and herbicides, fumigants and repellants, mechanism of action and toxicities of insecticides, fungides and herbicides.

### UNIT-I:

[12 Hours]

**Synthetic polymers:** Classification and Nomenclature. Methods of polymerization, Mechanism and Stereochemistry, Addition polymerization (Anionic, Cationic and Free radical process), Condensation and Stepwise polymerization, Coordination polymerization, Ring opening polymerization. Mechanism of co polymerization. Properties, Structure and applications of Polythene, Polypropylene, PVC, Polystyrene & Acrylic polymers, Teflon, polyesters, polyamides, Phenol-Formaldehyde resins, Urea-Formaldehyde resins, Epoxy resins, Polyurethanes, Polycarbonates, Synthetic rubber. Structural features and manufacture of natural rubber and Regenerated cellulose. Ziegler-Natta catalyst.

**UNIT -II :****[12 Hours]**

**Dyes:** Introduction, modern theories of colour and chemical constitution. Classification of dyes, methods of applying dyes to the fabrics. A general study of Azo dyes- Orange –II, rosanthrene O, Naphthol blue black 6B, Mordant brown, Congo red, Methyl orange, Chrysoidin G, Bismark brown.

Triphenylmethane dyes- Malachite green, Rosaniline, Crystal violet and Phenolphthalein;

Cyanin dyes- Ethyl Red, Cyanin blue and Quinaldine, Reactive dyes and Optical brighteners-

Tinopal and Blankophor.

Pigments: Fast violet, Lake red and Orange R.

**UNIT - III :****[12 Hours]**

**Insecticides:** Introduction, classification, mode of action and synthesis of Methoxychlor, chlordane, heptachlor, Hexachlorocyclohexane, Parathion, Diazenon, Sevin and Beygon. Naturally occurring insecticides-pyrethroids-natural pyrethrins-isolation and structures, synthetic pyrethroids.

**Insect Pheromones:** Introduction, use in insect pest control. Synthesis of disparlure, grandisol and bombykol.

**Fungicides:** Introduction, Systemic fungicides-types & examples.

**Herbicides:** Introduction, study of sulfonyl ureas and heterocyclic sulphonamides.

Fumigants and repellants. Mechanism of action and toxicities of insecticides, fungicides and herbicides.

**References**

1. Polymer Science- V.R.Gowariker, N.V.Vishwanathan & T.Shridhar (Wiley Eastern) 2008.
2. Textbook of Polymer Science, 3rd Edition, [Fred W. Billmeyer](#) (Wiley) 1984.
3. A Textbook of Synthetic Dyes- [O.D. Tyagi](#) & [M. Yadav](#) (Anmol Publications) 2002.
4. [Textbook of Dyes - A. Arora](#) (Sonali Publications) 2009.
5. Synthetic Dyes – Vol-I – Venkataraman, 1999.
6. Synthesis and Chemistry of Agrochemicals, Vol I & II, ACS, Washington
7. Chemicals for Crop Protection and Pest Managements, M B Green, G.S. Hartley West, Pergamon.
8. Chemistry of Insecticides and Fungicides, SreeRamulu, Oxford & IBH, 1985.

**AC S 555: APPLIED ELECTROCHEMISTRY****COURSE OUTCOME:**

- The course covers important practical applications of electrochemistry. Batteries, fuel cells, sensors and electroplating techniques are dealt with.
- The use of electrochemical techniques in environmental related issues are discussed
- chemical processes such as costing and design of electrochemical processes,
- They can learn important organic and inorganic reactions which can be carried out in industries and modern technological developments in electrochemical industrial processes.

**UNIT-I :****[12 Hours]**

**Electrochemical Energy System:** Electricity storage-Importance, storage density, Fundamentals and classification of batteries, Primary battery (Laclanche-dry cell and Alkaline cell). Secondary battery (acid and alkaline). Reserve batteries. Lithium batteries - (primary and secondary and lithium based conducting polymer battery). Fuel cells – introduction, classification, H<sub>2</sub>-O<sub>2</sub> and bio-cells.

5hrs