

JNC302 (Jan) 3:0

Polymer and Supramolecular Chemistry

Fundamentals of Polymer chemistry and Polymeric materials:

- Introduction, Molecular weight, Dispersity, stereochemistry, characterization, Step growth and chain polymerization. Types of polymerization - Condensation polymerization: Addition polymerization (cationic, anionic, free radical).
- Living Polymerization- ROMP, GTP, ATRP.
- Copolymerization - random, alternating and block copolymers.
- Structural Analysis - Regio- and Stereo-regularity in polymers and their estimation.
- Functional Polymeric materials - Conducting polymers- liquid crystals/Liquid crystalline polymers- dendrimers/dendritic polymers- Hyper branched/star polymers; supramolecular polymers -Biodegradable polymers-block copolymer lithography. Stimuli-responsive polymers, helical polymers.

Supramolecular Chemistry and Materials:

- Concepts and Basic Principles – Molecular Recognition, Pre-organization, Non-Covalent Interactions, Co-operativity, Multivalency. Supramolecular Synthesis - Common Motifs in Supramolecular Chemistry, Self-assembly and Self-Organization.

Reference Books:

1. George Odian, "Principles of Polymerization".
2. Paul J. Flory, "Principles of Polymer Chemistry".
3. Fred W. Billmeyer, "Textbook of Polymer Science"
4. Jonathan W. Steed, Jerry L. Atwood, "Supramolecular Chemistry"
5. Hans-Jörg Schneider and Anatoly Yatsimirsky, "Principles and Methods in Supramolecular Chemistry".
6. Jean-Marie Lehn, "Supramolecular Chemistry : Concepts and Perspectives".
7. Christoph A. Schalley, "Analytical Methods in Supramolecular Chemistry".