IP 322 January 3:0

Polymer Chemistry

Instructor

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Teaching Assistant

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Department: Inorganic and Physical Chemistry

Course Time: Tue, Thu,; 8:30 - 10:00 AM

Lecture venue: IPC Lecture Hall

Detailed Course Page:

Announcements

Brief description of the course

An introductory course to Polymer Chemistry, which will give the student a fundamental understanding of all the basic principles in polymer chemistry. Any student who has taken basic level courses in Organic, Inorganic and Physical Chemistry would benefit from this course; it would provide the student a valuable introduction to this fairly important area of polymers. Since it begins with fundamentals, no prior knowledge of polymers is assumed.

Prerequisites

First level courses in Organic, Inorganic and Physical Chemistry

Syllabus

Principles of polymerization â€“ chain versus step growth process. Kinetics of chain polymerization process, estimation of various rate constants. Determination of molecular weight of polymers and their distribution. Characteristics and mechanisms of various chain polymerizations â€“ radical, cationic, anionic, Ziegler-Natta and ring opening metathesis polymerizations. Living polymerizations â€“ criteria for livingness, newer methods for living polymerizations â€“ GTP, ATRP and TEMPO-mediated radical polymerizations.

Copolymerization â€“ random, alternating and block copolymers and kinetic schemes for analysis of copolymerization. Microstructural analysis of polymers â€“ estimation of regio- and stereo-regularity in polymers, sequence distribution in copolymers etc, mechanisms for stereo-regulation. Molecular structural elucidation of polymers by NMR.

Course outcomes

Students will come out with:

a strong appreciation of all aspects of polymer chemistry

an understanding of how polymers are prepared and where they are used

an knowledge of how polymers are characterized

knowledge of all contemporary methods of polymer synthesis

an appreciation of several specialty polymers and their applications

Grading policy

Mid-term (2 tests, one mid-term and assignments) = 50 %

Final Exam = 50 %

Assignments

Resources