CHIM2262 Macromolecular chemistry II

[22.5h] 2.5 credits

Teacher(s): Jean-François Gohy
Language: French
Level: Second cycle

Main themes

Chapter 6 : Ionic polymerisation: - anionic polymerisation of vinyl monomers - polymerisation thermodynamics - cationic polymerisation of vinyl monomers - ionic polymerisation of cyclic monomers ; polymerisation by group transfer. Chapter 7 : polymerisation by transition metal complexes: - introduction - olefin and 1-3 dienes polymerisation by catalysers of Ziegler and Natta - polymerisation of ethylene by the Phillips catalyser - polymerisation of cyclic olefins by metathesis - main polymers synthesized by transition metal complexes. Chapter 8 : Polycondensation : - characteristics of polycondensations - molecular masses and their distribution in linear polycondensation - balanced polycondensations - polycondensation kinetics - cycle formation - three-dimensional network formation, gel point - polycondensation techniques - copolycondensation - high performance polycondensation. Chapter 9 : Chemical modification of polymers: - main reactions on polymers - reactivity and mechanisms - kinetic - techniques and main applications. Chapter 10 : Polymer degradation: - depolymerisation - thermal decomposition - degradation : oxidizing, photo degradation, by ionic radiation, mechanic, biological.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites: thorough knowledge of general, organic and inorganic chemistry. Basic knowlegde in macromolecular chemistry will be useful.
Evaluation: written examination (about 3 h) and a short oral examination (about 15 min).
Main support: book
- P. Rempp, E.W. Merrill "Polymer Synthesis", 2nd revised edition, Hüthig & Wepf, ISBN 3-85739114-6.
Others useful supports: books
- J.M.G. Cowie "Polymers: Chemistry & Physics of Modern Materials", 2nd ed. Blackie Academic & professional, ISBN 0 7514 0134X;
- J.P. Mercier, E. Maréchal "Chimie des Polymères", Presses polytechniques et universitaires romandes, ISBN 2-88074-240-4;
- Handbook of Polymer Synthesis, Parties A and B, H.R. Kricheldorfed., Marcel Dekker, ISBN 0-8247-8514-2 and 0-8247-8515-0.

Other credits in programs

CHIM22 Deuxième licence en sciences chimiques