



## CHIM2261 Chimie macromoléculaire I

[22.5h] 2.5 credits

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

### Main themes

Chapter 1 : Introduction: - historical and perspectives - polymer structure - classification of polymerisation reactions. Chapter 2 : Deeper study of homogeneous radical polymerisation: - general scheme - global kinetic with small conversion rate - kinetic with high conversion rate - stereochemistry of radical polymerisation - transfers, inhibition and length of the kinetic chain. Chapter 3 : Heterogeneous radical polymerisation : - mass polymerisation with precipitation of the polymer - polymerisation of ethylene under high pressure - polymerisation in suspension - polymerisation in emulsion. Chapter 4 : Radical copolymerisation : -variation of the composition of the copolymer, depending on the values of  $r_1$  and  $r_2$  - copolymerisation modified by the complexes of charge transfer - experimental determination of  $r_1$  and  $r_2$  - structure and reactivity of monomers - radical copolymerisation speed. Chapter 5 : Polymerisation of dienes by radical route : - copolymerisation of a diene with independent vinyl groups with a monomer of the same reactivity - polymerisation of linked dienes - cyclopolymerisation of 1-6 heptadienes - greffing of styrene and of the acrylonitrile on polydienes.

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

Prerequisites: thorough knowledge of general, organic and inorganic chemistry. Basics in macromolecular chemistry.

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;

- Handook of Polymer Synthesis, Parties A et 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