



## METADATA

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### Abstract

This book deals with the subject of Polymer Chemistry in a way that is both educational and scientifically complete, and thorough. Due to the large extent of the subject, an attempt is made to combine basic knowledge of macromolecular chemistry with the modern challenges that the polymer industry has to face, through a mainly educational approach aimed at understanding it by undergraduate students. Our ambition is to give the impetus to young scientists to get to know the wonderful world of polymers and to understand the secrets hidden in the Chemistry of macromolecular compounds. The book has been written aiming to be used in the teaching of a semester course. The structure of the book is based on three major thematic sections. In the first section, which concerns the synthesis of polymers, the various mechanisms and kinetics of polymerization reactions

(chain, step), as well as controlled polymerization and copolymerization reactions are presented in detail. To emphasize the connection between chemistry and everyday life, the characteristics of the most well-known commercial polymers are described. In the second section, the key properties that make polymers stand out from conventional materials are analyzed, such as Molecular Weight Distribution, amorphous and crystalline state, and glass transition temperature. In the third section, characteristics of environmentally friendly and specialized classes of polymers are presented, such as biodegradable, bio-based, conductive, photonic, hydrogels etc. Finally, the relationship of polymers with the environment is described, through contemporary issues such as microplastics, the possible existence of harmful substances and polymer chemical recycling methods.

