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Polymer Chemistry: An Introduction



Synopsis

Now updated to incorporate recent developments in the field, the third edition of this successful text offers an excellent introduction to polymer chemistry. Ideal for graduate students, advanced undergraduates, and industrial chemists who work with polymers, it is the only current polymer textbook that discusses polymer types according to functional groups. It provides a comprehensive and up-to-date overview of the chemistry of macromolecular substances, with particular emphasis on polymers that are important commercially and the properties that make them important. Major topics include polymer synthesis and nomenclature; molecular weight and molecular weight distribution; reactions of polymers; recycling of polymers; methods used for characterizing and testing polymers; morphology; stereoregular polymers; polymer blends; step-growth, chain-growth, and ring-opening polymerization; commercially important addition and condensation polymers; and heterocyclic, inorganic, and natural polymers. Review exercises, many including journal references, are provided to help lead students into the polymer literature. Polymer Chemistry, 3/e, offers the most up-to-date treatment available of new developments in this rapidly changing field. It covers dendritic and hyperbranched polymers, olefin polymerization using metallocene catalysts, living free radical polymerization, biodegradable bacterial polyesters, mass spectrometric methods for determining molecular weights of polymers, atomic force microscopy for characterizing polymer surfaces, and polymers exhibiting nonlinear optical properties.

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Customer Reviews

"Polymer Chemistry: An Introduction" is an excellent text for an upper division undergraduate or graduate level course in polymer chemistry. The book is also enjoyable to read for scientists and engineers in the polymer and materials fields. The content is logically organized, there is fairly in-depth discussion of mechanisms of polymerization reactions and of the origins of stereoregularity in polymers, and the problems at the end of each chapter are more than adequate for reviewing the subject matter. Professor Stevens clearly introduces the reader to the subject of polymer chemistry, relating the physical properties of macromolecular materials to polymer orientation, microstructure, stereochemistry and chemical composition. He also provides an enormous amount of information on the history of polymers in a fashion that effectively reinforces the important concepts being described. I find myself referring to this text far more frequently than the other polymer texts on my bookshelves.

I was not able to fit polymer chem into my schedule at University, so I bought this book after graduating. This book is extremely organized and provides a lot of examples. The first of three sections provides a great introduction with the focus on definitions and structure. This is accomplished with very little reference to reactions. The next two sections, which are titled vinyl and nonvinyl polymers respectively, address reaction mechanisms and kinetics. This layout allowed for smooth transitions between sections and concepts were introduced and reinforced smoothly. The other thing I liked about it, is the continuous reinforcement of nomenclature...every time a name was used a corresponding structure was on that same page.

This textbook does an excellent job of going over the basics of polymer chemistry. There are insightful questions at the end of chapters that make students think and the book goes over the material in such a way that a background in organic chemistry is not necessary. If you need to learn about polymer chemistry on your own, this book is an excellent purchase.

Besides this excellent book by Stevens the other good textbooks for one semester university polymer courses are: (1) "Introduction to Polymer Chemistry" 2nd or 3rd Edition by Charles E. Carraher, Jr. (2) "Polymer Science and Technology" 2nd or 3rd Edition by Joel R. Fried (3) "Polymers" by David Walton and Phillip Lorimer (Oxford Chemistry Primers) If you want high school level material consider (1) "Giant Molecules: Essential Materials for Everyday Living and Problem Solving" 2nd Edition by Charles E. Carraher Jr. (2) "Polymer Chemistry: Introduction to an Indispensable Science" by David Teegarden (3) "The Chemistry of Polymers" by John W.

Nicholson, any edition. University-level reference books: (1), "Principles of Polymerization", 4th Edition by George Odian (highly recommended) (2) "Introduction to Polymers" 3rd Edition by Robert J. Young and Peter A. Lovell (3) "Organic Polymer Chemistry" 2nd Edition by K. J. Saunders (4) "Organic Chemistry of Synthetic High Polymers" by Robert Lenz (5) "Contemporary Polymer Chemistry" 2nd or 3rd Edition by Harry R. Allcock and Frederick W. Lampe (6) "Textbook of Polymer Science" 3rd Edition by Fred W. Billmeyer Jr. (7) "Polymer Science and Technology" by Robert O. Ebewele (8) "Introduction to Synthetic Polymers" 2nd Edition by Ian M. Campbell Check out my reviews for other chemistry books.

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