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Most of the advancements in communication and computers, medicine and air and water purity are tied to macromolecules and the fundamental understanding of the principles that govern their behavior. Much of this revolution is of a fundamental nature and is explored in this latest edition. This book contains these basic principles as well as further applications applicable to real-life situations. Technology is the application of scientific principles, therefore, there is often little, if any, division between science and technology.

The importance of the environment and our interaction with it is becoming increasingly evident. Industry is increasingly emphasizing green science and practices that are favorable to the environment. Polymer science is part of this increased emphasis and contributes critical components to solutions. This book continues to emphasize these measures, including special sections that deal directly with environmental issues as well as integrating green science appropriately woven within the fabric that is polymer chemistry. Consistent with the continued emphasis on green chemistry, new sections that deal with photochemistry and green materials have been added.

Polymers are found in the organic natural world as building blocks for life itself. They are also found as inorganic building blocks that allow the construction of houses, skyscrapers, and roads. Synthetic polymers serve as basic building blocks of society today and tomorrow. This book includes all these of these critical segments of polymeric materials.

A basic understanding of polymers is essential to the training of today's science, biomedical, and engineering students. This book complies with the American Chemical Society's Guidelines for Professional Training guidelines as an advanced or in-depth course. It naturally integrates and intertwines the important foundational ideas, since polymers are critical to all of the foundational areas, with all of these foundational areas contributing to the growth of polymer science. Most of the fundamental principles of polymers extend and enhance similar principles found throughout the undergraduate and graduate training of students. This allows students to integrate their chemical knowledge, illustrating the connection between fundamental and applied chemical information. Thus, along with the theoretical information, application is integrated as an essential part of the information. As in other areas, such as business and medicine, recent case studies are integrated as historical material.

While this book is primarily written as an introductory graduate-level text, it can also be used as an undergraduate text, or as an introductory undergraduate-graduate text. The topics are written so that the order and inclusion or exclusion of chapters or parts of chapters will still allow the students an adequate understanding of the science of polymers. Most of the chapters are written beginning with the theory followed by application. The most important topics are generally at the beginning of the chapter followed by important, but less critical, sections. Some will choose to take the synthesis-intensive chapters first, others will take the analytical/analysis/properties chapters first, and others will simply take the chapters as they appear in the text. The book contains all of the elements of an introductory text with synthesis, property, application, and characterization all present, allowing this to be the only polymer course taken by an individual or the first in a series of polymer-related courses taken by a student.

This edition continues in the "user-friendly" mode with special sections in each chapter containing definitions, learning objectives, questions, and additional reading. Application and