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# A Review of "Introduction to Polymer Chemistry: A Biobased Approach"

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# Book Review

"Introduction to Polymer Chemistry: A Biobased Approach" by Judit E. Puskas. DEStech Publications, Inc., Lancaster, PA, 2014; ISBN: 978-1-60595-030-3; xii+338pp; $124.50 (softcover).



"Introduction to Polymer Chemistry: A Biobased Approach" by Judit E. Puskas is a new textbook designed to teach polymer chemistry to biology-oriented, advanced placement secondary students or early undergraduate students. Because of this focus, rather than discuss the polymerization mechanisms of synthetic plastics, rubbers, fibers, paints, and adhesives, the book centers on the natural polymerization processes of biologically essential polymers such as polynucleic acids, proteins, carbohydrates, etc.

The book may be divided into three sections. The first section (Chap. 1) provides a brief overview of the history and fundamental concepts of polymer science. Natural rubber is used as an example to connect naturally occurring polymers with modern polymer chemistry. While this section is well-written, it is believed that real-life examples to explain some of the concepts such as glass transition temperature, molecular mass, and radius of gyration would be more helpful for students to understand. Further, since many natural polymers perform their biological functions in solutions, fundamental concepts in this area could be valuable additions to the current text.

The second section is where this book really shines. Natural polymers including polynucleic acids, proteins, terpenoids, carbohydrates, and lignin are discussed in Chap. 2–6. For each class of the polymers, the building blocks (monomers), polymer structure, natural polymerization process (initiation, propagation, termination, and reaction mechanism), postpolymerization modification, and recycling are introduced. These topics should be of great interests to the targeted students. Even for an experienced polymer chemist, the text about how the nature builds, uses, and recycles various polymers is quite fascinating and inspiring. Chapter 7 discusses self-assembly, using cell membrane and bone tissue as examples. It is felt that more detailed explanations of the figures might be needed for a deeper understanding of this phenomenon.

The last section provides glossary of terms related to kinetics, thermodynamics, and mechanics of polymerization (Appendix A), a teacher packet for PCR study (Appendix B), and questions and answers. Appendix A is rather inclusive and well- organized. For Appendix B, it would be even more helpful to include details of other suggested experiments.

In summary, Judit E. Puskas deserves applause for producing this novel textbook to teach polymer chemistry from the point of view of biology. It is certainly interesting to follow the long-term impacts of this new approach in stimulating students' interests in polymer science and encouraging more environmentally friendly designs of the next generation synthetic materials.

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