

PRIKAZI KNJIGA

BOOK REVIEWS

Zvonimir Janović

Polimerizacija i polimeri

HDKI – Kemija u industriji

Zagreb, 1997, 513 pp, 131 illus., 41 tables, 199 ref.
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The book **Polymerization and Polymers**, written by Professor Zvonimir Janović, Faculty of Chemical Engineering and Technology, University of Zagreb, is the first one of the kind issued in the Croatian language. The author very successfully combines his experience gained as a scientist in the field of polymer science and technology-engaged for a period of time in industry (Research and Development Institute, INA-Zagreb) and as a university professor teaching graduate and undergraduate courses in the field. The book can be used both as a textbook for graduate and undergraduate students of chemistry, chemical engineering and material science and as a reference book for the professionals working in industry or in academic institutions involved in polymer research (because of descriptions of industrially important polymers).

The book consists of ten chapters. The first chapter, entitled *Structure and Properties* (70 pages), offers a brief description of polymer classification, nomenclature, historical development, followed by a general discussion on the polymer chain structure, molecular weight and molecular weight distribution. Basic properties of polymer solutions and solid state properties are also described. Fundamental concepts given in this chapter are a very good introduction into polymerization processes and materials.

The second chapter, *Polymerization Reaction Processes and Materials* (65 pages), gives an introduction to various polymerization reactions, followed by descriptions of some polymeric materials, including additives, with a brief account of their mechanical properties. The chapter closes with polymer mixtures and liquid polymer crystals.

The third chapter, *Step Polymerization and Polymers* (80 pages), describes in detail polycondensation reactions, reaction rate, molecular weight distribution and crosslinking, with well-chosen examples, diagrams and tabulated data. Then follows a description of the main class of polymers obtained by this method, and their properties and application.

Free Radical Polymerization (51 pages) is the fourth chapter. It covers the basic concepts: mechanisms of free-radical reactions, then the initiation reaction and initiators, propagation, termination, chain transfer and inhibition reaction, including inhibitors. The influence of temperature upon the polymerization reaction is given as well.

The fifth chapter, *Free Radical Copolymerization* (57 pages), describes the basic principles of copolymerization reactions and copolymerization methods following the same presentation as in the case of free radical polymerization, offering relevant equations and diagrams.

The sixth chapter, *Polymers of Radical Polymerization* (52 pages), is a very concise description of the main class of these polymers and copolymers.

The seventh chapter, *Anionic Polymerization and Polymers* (33 pages), deals with the basic monomers and Initiation systems of anionic polymerization, their kinetics and corresponding mechanisms, together with anionic living and stereospecific polymerization and copolymerization. At the end of the chapter, some characteristic polymers and their properties are discussed.

Cationic Polymerization and Polymers (the eighth chapter – 26 pages) is presented in a similar way as anionic polymerization.

The ninth chapter, *Coordination Polymerization and Polymers* (23 pages), describes the principles, mechanisms and kinetics of stereospecific polymerization, the corresponding catalysts and polymers.

The last chapter, *Polymer Degradation Stabilization and Flammability* (43 pages), is a logical continuation of the previous chapters, which provides general information on correlation between the structure of polymers and their degradability. A brief description of degradation mechanisms, kinetics and protection against degradation and flammability is given, including a description of antioxidants and stabilizers.

At the end of each chapter, the reader will find references to textbooks, review articles and relevant up-to-date publications. The last few pages give a list of abbreviations and symbols, a subject index and a three-page English summary.

The book is both well written and presented. All the basic concepts, especially polymerization reactions, are systematically described, documented with a number of examples, equations, tables and illustrations. The author successfully describes the relationship between the structure and the properties of polymers, and how this correlation could be affected in the course of polymerization reactions. Moreover, the book is technically well equipped.

Therefore, I recommend this book, not only to students, but also to everybody involved in the field extending from chemistry and physics to the production and applications.

Zorica Vekšli