

## Handbook of Polyolefins

*Edited by Cornelia Vasile and Raymond B. Seymour, Marcel Dekker, 1993, \$225, 110 pp.*

The *Handbook of Polyolefins* contains four sections covering polyolefin synthesis, polymer structure and properties, additives for polyolefins, and processing and applications. Although the words "Synthesis and Properties" appear on the cover of the book, only 116 of the book's 1,039 pages deal with polymer synthesis, and the bulk of this section is devoted to a very good survey of the latest research into cycloolefin homo- and copolymerization. Only 18 pages discuss the polymerization of the major polyolefins, polyethylene and polypropylene, and most of this is focused on catalysis. The emphasis on cycloolefin polymerization is surprising since this book, for the most part, is concerned with the properties and applications of commercial olefin polymers.

The section on polyolefin structure and properties is uneven in quality and ranges from very short descriptive surveys with very few references to very detailed reviews with discussions of relevant theory and background, copious tables of data, and extensive references. The best work in this section includes the chapters on the morphology and crystallization of polyolefins, the melting of polyolefins, and their degradation and decomposi-

tion behavior. All of these chapters contain more than 300 references with literature cited through 1991. In particular, the review of decomposition and degradation brings together many results on polymer breakdown by various mechanisms that is not readily available elsewhere. The chapter on "Properties of Polyolefins" is also excellent. Extensive tables and graphs are presented with the thermodynamic, mechanical, rheological, electrical, and optical properties of a wide variety of polyolefin structures based on published literature through 1990.

Additives are a critical technology for the commercial success of polyolefins in a broad range of applications, and the reviews of additives brought together in this section of the book are a welcome addition to the literature. Very good chapters cover antioxidants, photostabilizers, and special additives such as blowing agents and flame retardants. There is also a good introductory survey on the compounding of polyisobutylene and ethylene-propylene copolymer rubbers. Chapters on polyolefin fibers and filled polyolefins were less informative, and the chapter on polyolefin blends was too short to do more than scratch the surface of this very extensive field.

The final section of the book covers various mixing, processing, and forming processes, such as extrusion, injection molding, printing on polyolefins, elas-

tomers processing, and fiber formation. These chapters are primarily descriptive and present various options for machines or processes with typical operating conditions. They provide a good introduction to applicable processing technology for a particular product, but the specialist will not find much detailed information. Except for a brief discussion on extrusion theory, topics such as process design principles or the effect of product properties on processability are not discussed. A chapter on quality control in this section provides a useful compilation of ASTM and other routine tests for measuring product quality in a variety of applications.

The book has been produced with a type face that is easy on the eyes, and the tables and graphs are clear and well organized. Each chapter is followed by a list of nomenclature and references. Although the large majority of contributing authors are European, the text is generally well written in good technical English. This volume would be the first book off my shelf as a reference on the thermal behavior of polyolefins, various property values, and information on additive systems. There are better reviews available for the other subjects covered in this book.

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