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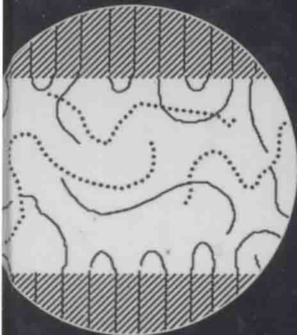
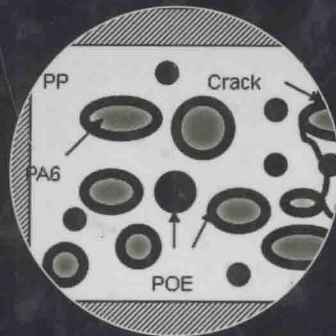
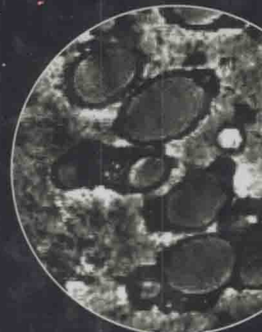
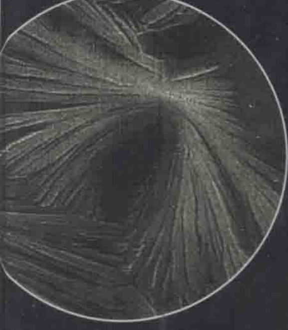
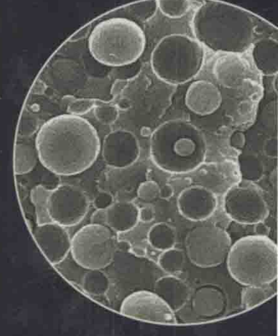





# POLYOLEFIN BLENDS





*Edited By*

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# POLYOLEFIN BLENDS

**Edited by**

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# POLYOLEFIN BLENDS

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# Preface

Polyolefins are the most widely used commodity thermoplastics. They are of immense interest to polymer community because of their simple chemical structures and fascinating hierarchical structural organizations possible. To date, the field of polyolefins remains one of the most vibrant areas in polymer research.

Polyolefin blends are a subset of polymer blends that emerged as a result of the need to meet application requirements not satisfied by synthesized neat polyolefins. In comparison to other subsets of polymer blends, polyolefin blends have distinct advantages of lower density, lower cost, processing ease, and good combination of chemical, physical, and mechanical properties. In the last several years, research and usage of polyolefin blends have increased due to new application opportunities (e.g., in medical and packaging) and the development of novel polyolefins.

Although a sizable number of books on polyolefins and general polymer blends are available, only a few chapters address polyolefin blends. Currently, there is no single book that focuses exclusively on the fundamental aspects and applications of polyolefin blends. This is the primary source of motivation behind this book. The second motivation stems from the fact that new research trends in polyolefin blends such as *in situ* reactor blending and compatibilization/functionalization in the melt have emerged that need to be covered in a book format.

This book is structured as follows: Chapter 1 serves as a guide to polyolefin blends introducing this important class of materials, why they are important, typical systems studied, issues of fundamental and applied interest, and current trends. The contributed chapters are divided into two main categories: polyolefin/polyolefin blends (Chapters 2–16) and polyolefin/nonpolyolefin blends (Chapters 17–21). Issues covered in these chapters include miscibility, phase behavior, functionalization, compatibilization, microstructure, crystallization, hierarchical morphology, and physical and mechanical properties. Most of the chapters are in the form of review articles. Some original articles are included to capture the latest development in polyolefin blends research.

This book is intended to serve as a valuable reference for academic and industrial professionals performing research and development in the specific area of polyolefin blends or in the general area of polymer blends. Some review chapters include introductory materials to attract newcomers including senior undergraduate and graduate students and to serve as a reference book for professionals from other disciplines. Some knowledge of polymer chemistry, physics, and engineering, although not strictly essential, would be helpful to better appreciate the technical information of some chapters. Since this book is the first of its kind devoted solely to polyolefin blends, it is hoped that it will be sought after by a broader technical audience.

The chapters in this book were contributed by highly reputed professionals from academia, industry, and government laboratories spanning several countries from various continents. All manuscripts were peer reviewed in accordance with the guidelines utilized elsewhere by top-rated polymer journals. The editors would like to thank all contributors for believing in the realization of this book and taking painstaking tasks of going through the processes of manuscript preparation, submission, review, revision, and seeking supporting documents. Finally, sincere thanks are extended to all reviewers for their invaluable help, which undoubtedly improved the quality of this book.

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Thein Kyu

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