

Principles of Polymer Chemistry

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Third Edition

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Preface

This book, unlike the first and second editions, is primarily aimed to be a textbook for a graduate course in polymer chemistry and a reference book for practicing polymer chemists. The first and second editions, on the other hand, were aimed at both graduate and undergraduate students. Comments by some reviewers, that the first two editions are too detailed for use by the undergraduates, prompted the change.

The book describes organic and physical chemistry of polymers. This includes the physical properties of polymers, their syntheses, and subsequent use as plastics, elastomers, reagents, and functional materials. The syntheses are characterized according to the chemical mechanism of their reactions, their kinetics, and their scope and utility. Whenever possible, descriptions of industrial-scale preparations are included. Emphasis is placed on reaction parameters both in the preparation of the polymeric materials and in their utilization as reagents. Also, when possible, industrial or trade names of the polymeric materials are included to familiarize the students. This book also describes chemical modifications of polymers. A separate chapter is dedicated to utilization of polymers as reagents, supports for catalyst or for drug release, as electricity conductors, and in photonic materials.

Use of this book requires proficiency in organic and physical chemistries. While prior knowledge of polymer chemistry on the elementary level is not required, some exposure to the subject on the undergraduate level would probably be helpful. Each topic, however, is presented with the assumption that the reader has no prior knowledge of the subject.

This book consists of ten chapters. A separate chapter on physical properties and physical chemistry of polymers was added. In the previous editions, this subject was part of the introduction and handled on a limited scale. This book is aimed at graduate students, however, and a more rigorous treatment is required.

The kinetic treatment was expanded in the chapters that deal with polymer syntheses. In addition, discussions of the thermodynamics of these reactions were added to each of these chapters.

In the earlier two editions, a 5¼ in. diskette was included at the end of the books with some computer programs in Pascal. These programs were there to offer the students experience in calculating results from size exclusion chromatograph or to determine sequence distribution in polymers from NMR spectra, and some others. These programs have been omitted, however, because there are now considerably better programs, written by professional computer scientists, now commercially available.

This book, like the earlier editions, is dedicated to all the scientists whose names appear in the references.

Niles, IL, USA

A. Ravve

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