Amundson. The earlier version appeared in 1973 and is out of print. In the revision, Volume I covers single equations, while Volume II will cover systems of coupled equations.

First-order partial differential equations arise in chemical engineering largely as convective conservation laws. The principal applications in the book are chromatography and adsorption processes. Additional applications include heat exchange, pool boiling, chemical kinetics, reaction engineering, water flooding of petroleum reservoirs, propagation of sound waves, and sedimentation. A substantial amount of material has been added in revision on countercurrent adsorption in moving beds and traffic flow.

Volume I covers material presented in the first seven out of nine chapters of the earlier version; originally, 267 pages, now the treatment has been expanded to roughly twice that number. The presentation has been considerably reorganized. While little of the earlier version has been left out, the material added is nicely balanced between broad treatment of applications and thorough explanations of theory. The expanded treatment in the central chapters in particular is an improvement over the previous version.

The approach adopted in the book is to classify equations by type and present methods appropriate for the solution of the various types. The coverage is comprehensive. Especially detailed treatment is given of the homogeneous quasilinear equation with considerable discussion of simple waves and the formation and propagation of shocks.

In the preface, the authors express their hope that the book will be used in applied mathematics course offerings for first-year graduate students. Indeed it should be for several reasons. The subject is an important one. The book contains a number of exercises, many of which were added to the revision. Throughout the book, particularly, the early and central chapters where the main ideas are presented, the treatment is easy to follow. The authors tie together engineering literature and more formal mathematical literature. Referencing is thorough and up-to-date. For many of these same reasons the authors deserve the thanks of researchers active in the areas of application.

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Plastics Technology Handbook

By M. Chanda, and S. K. Roy, Marcel Dekker Inc., New York, NY, 568 pp., 1987, $99.75.

This book is divided into the following four sections and contains six appendices.

Section 1: Characteristics of Polymers. It deals with their definitions and concepts.

Section 2: Fabrication processes. Discussed in this section are the major polymer conversion processes.

Section 3: Plastics Properties and Testing. Various properties and the testing methods of plastics are described.

Section 4: Industrial polymers. This main section is divided in three parts to focus on the chemical structure, synthesis, and typical applications.

1. Addition Polymers: polyolefins, olefin copolymers, acrylics, vinyl polymers

2. Condensation Polymers: polyesters, polyamides, formaldehyde resins, polyurethanes, ether polymers, cellulosic polymers

3. Special Polymers: heat resistant polymers, silicones and other inorganic polymers, functional polymers

In light of the increasing trend of new books toward specialization and theoretical aspects of polymer science and engineering in recent years, it is comforting to see a book which is broad in contents and basic in level of treatment.

As the press release by the publishers states, this book could be appealing to various readers—from plastics, mechanical and chemical engineers, to colloid, oil and color chemists, as well as materials scientists and students (both undergraduates and graduates) taking courses in plastics and polymers. Many will find the section dealing with electrical and optical properties quite valuable, while others will find the treatment of the micromechanics of reinforced plastics well structured and educational. The main section describing industrial polymers contains a wide range of useful information on new polymers, particularly the specialty polymers. Extremely useful for those involved in selection and use of polymers is Appendix 1 which lists trade names and manufacturers for polymers available commercially, and Appendix II which lists typical properties.

There are, however, a number of shortcomings varying from superficialities and inconsistencies to fundamental inadequacies. While one may tolerate the "minestrone" approach to the use of units for polymer properties and processing parameters, there can be no excuse for dismissing "extruder capacity" with a half page treatment which includes two unfamiliar and simplistic empirical equations. Very little attention has been given to additives, and plasticisers are discussed primarily in terms of solubility parameters and what characteristics they should possess, without discussing how they affect properties.

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High Resolution NMR Spectroscopy of Synthetic Polymers in Bulk

By Richard A. Komoroski, Ed., VCH Publishers, Inc., Deerfield Beach, FL, 379 pp., 1986, $75.00

The past twenty years have witnessed the development of techniques for high-resolution nuclear magnetic resonance spectroscopy of rigid solids. This book is the first dedicated compendium of applications of these techniques to synthetic polymers. The book is intended to serve both as a summary of work published to date and as a guide for further research. It was written primarily for polymer scientists who have some familiarity with NMR and an interest in applying high-resolution techniques to bulk systems. For such an audience, most of the book should be readily understandable. The text is organized by topics in polymer science, which emphasizes the wide range of applicability of the techniques to this field. Mathematical justification for the spectroscopic methods is limited. Instead, specific examples drawn from the polymer literature are presented and discussed in detail.

The first chapter of the book provides an overview of potential applications of high-resolution NMR methods to solid polymers, introducing many of the topics to be dealt with later and mentioning other areas such as imaging, bipolymers, and surfaces. Chapter 2 summarizes the line-narrowing and sensitivity-enhancement techniques used for recording high-resolution spectra of dilute spins in solids. These include magic-angle spinning, high-power decoupling, and cross polarization. The next three chapters deal with applications of these methods to glassy