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polymer science is fundamentally interdisciplinary yet specialists in one aspect such as chemistry or processing frequently encounter difficulties in understanding the effects of other disciplines on their own this book describes clearly how polymer chemistry and polymer processing interact to affect polymer properties as such specialists in both disciplines can gain a deeper understanding of how these subjects underpin each other coverage includes step by step introductions to polymer processing technologies details of fluid flow and heat transfer behaviour shaping methods and physical processes during cooking and curing and analyses of moulding and extrusion processes

an authoritative reference on the processing and finishing of polymeric materials for scientists and practitioners owing to their versatility and wide range of applications polymeric materials are of great commercial importance manufacturing processes of commercial products are designed to meet the requirements of the final product and are influenced by the physical and chemical properties of the polymeric material used based on wiley s renowned encyclopedia of polymer science and technology processing and finishing of polymeric materials provides comprehensive up to date details on the latest manufacturing technologies including blending compounding extrusion molding and coating written by prominent scholars from industry academia and research

institutions from around the globe this reference features more than forty selected reprints from the encyclopedia as well as new contributions providing unparalleled coverage of such topics as additives antistatic agents bleaching blowing agents calendaring casting coloring processes dielectric heating electrospinning embedding processing and finishing of polymeric materials is an ideal resource for polymer and materials scientists chemists chemical engineers materials scientists process engineers and consultants and serves as a valuable addition to libraries of chemistry chemical engineering and materials science in industry academia and government

based on lecture notes from a five week polymer processing laboratory course taught at the university of wisconsin madison this text provides background on polymer processing for engineering students and practicing engineers

die leser mussten lange warten jetzt endlich zehn jahre nach erscheinen der ersten auflage gibt es die grundlegend überarbeitete neuauflage dieses klassikers inhaltlich erweitert und neu strukturiert doch an seinem konzept hat sich nichts geändert es ist eine präzise aber nicht mathematische einführung in das gebiet der kunststoffe die ökonomische bedeutung von kunststoffen bzw polymeren ist weiterhin enorm höchste zeit also für die neuauflage dieser erfolgreichen einführung sie gibt einen aktuellen und ebenso klaren wie detaillierten Überblick über rohstoffe herstellungsverfahren und die materialeigenschaften der kunststoffe letztere werden zu den molekularen und supermolekularen eigenschaften der polymere in beziehung gesetzt die kapitel zu polymerverbindungen morphologie fließverhalten und verarbeitung wurden gegenüber der ersten auflage erheblich erweitert neu hinzugekommen sind abschnitte zur elektrischen leitfähigkeit sowie zu nicht linearen optischen eigenschaften auch wer über die neuesten entsorgungsverfahren bescheid wissen möchte wird von elias bestens informiert ein wesentlicher grund für den erfolg der vorauflage sollte auch ihre fortsetzung zum bestseller werden lassen der klare mitunter brillante stil des autors so komplex die materie auch sein mag elias findet die angemessene sprachliche form dass verständlichkeit in diesem buch ganz groß geschrieben wird belegen auch sein aufbau sowie der sehr praktische übersichtliche index ob chemiker physiker materialwissenschaftler ingenieure oder techniker wer sich einen Überblick über kunststoffe und polymere verschaffen möchte dürfte kaum ein geeigneteres buch finden

many books offer coverage of the current work of top researchers but rarely is any attempt made to look beyond the present day emerging themes in polymer science is a unique book which not only documents the latest research but also provides an insight into the likely future of polymer science at the heart of the debate and a key feature of the book is the relationship between polymer science and biology also discussed are polymer semi conductors and devices polymer colloids biomaterials tissue engineering and polymers neutron and synchrotron research theory and rheology anyone involved in polymer research including those in the fields of electronics and nanotechnology will welcome this book

filling a gap in the literature and all set to become the standard in this field this monograph begins with a look at computational viscoelastic fluid mechanics and studies of turbulent flows of dilute polymer solutions it then goes on discuss simulations of nanocomposites polymerization kinetics computational approaches for polymers and modeling polyelectrolytes further sections deal with tire optimization irreversible phenomena in polymers the hydrodynamics of artificial and bacterial flagella as well as modeling and simulation in liquid crystals the result is invaluable reading for polymer and theoretical chemists chemists in industry materials scientists and plastics technologists

this book provides the background needed to understand not only the wide field of polymer processing but also the emerging technologies associated with the plastics industry in the 21st century it combines practical engineering concepts with modeling of realistic polymer processes divided into three sections it provides the reader with a solid knowledge base in polymer materials polymer processing and modeling understanding polymer processing is intended for the person who is entering the plastics manufacturing industry and as a textbook for students taking an introductory course in polymer processing it also serves as a guide to the practicing engineer when choosing a process determining important parameters and factors during the early stages of process design and when optimizing such a process practical examples illustrating basic concepts are presented throughout the book new in the third edition are chapters on data driven modeling and physics driven modeling as well as new sections on manufacturing and dimensional analysis in addition to a number of other smaller improvements and corrections throughout the book bonus code downloads are also provided contents part i polymeric materials this section gives a general introduction to polymers including mechanical behavior of polymers and melt rheology part ii polymer processing the major polymer processes are introduced in this section including extrusion mixing injection molding thermoforming blow molding film blowing and many others part iii modeling this last section delivers the tools to allow the engineer to solve back of the envelope polymer processing models it includes dimensional analysis and scaling transport phenomena in polymer processing and modeling polymer processes

it can be stated with some justification that polymers because of their mainly synthetic origins are important because of their applications perhaps more than in the case of more familiar and conventional materials such as metals and wood which would exist apart from their use in human activities the majority of polymers have been synthesized under the impetus of requirements for new and improved properties the preparative routes to new polymers and blends and the exploration of their structures and properties constitute absorbing subjects for study but it is the final application of these materials in real commercial products that provides the driving force for such developments in recent years a number of excellent books have appeared which deal with the chemistry structure properties and engineering aspects of polymers the processing of polymers as products of the chemical industry into engineering and consumer goods has received much less attention there are some valuable texts for individual processes especially the extrusion and injection moulding of thermoplastics but others are less well served this book provided a review of all the important processing routes for transforming polymers into products

this is the first published book that combines the applied and fundamental aspects of reactive extrusion a technology that has seen a tremendous growth in the past few years it is based on a highly successful advanced technical course given by the authors at the stevens institute of technology polymer processing institute the use of an extruder as a continuous reactor for processes such as polymerization polymer modification and blend compatibilization is gaining increasing popularity and competes with diluent free operations with respect to efficiency and economics the first part of the book emphasizes the technological aspects of reactive extrusion it includes case histories of industrial applications an analysis of existing continuous processes from reaction fundamentals and an extensive review of polymer modification reactions involving acid and anhydride functionalities and their applications the second part of the monograph contains an exhaustive survey of virtually all chemical reactions that have been conducted in extruders the important characteristics of over 600 processes listed in recent technical and patent literature are summarized the engineering fundamentals of reactive extrusion are included in the third part of the book which features a full description and comparison of available extrusion equipment heat

transfer considerations and the application of polymerization engineering principles to extruder reactions the book is intended for engineers and technologists involved in this industrially important sector of polymer processing

this completely new third edition of the mark encyclopedia of polymer science and technology brings the state of the art to the 21st century with coverage of nanotechnology new imaging and analytical techniques new methods of controlled polymer architecture biomimetics and more whereas earlier editions published one volume at a time the third edition is being published in 3 parts of 4 volumes each each of these 4 volume parts is an a z selection of the latest in polymer science and technology as published in the updated online edition of the mark encyclopedia of polymer science and technology available at mrw interscience wiley com epst order the 12 volume set isbn 0471275077 now for the best value and receive each of the 4 volume parts as they publish the complete list of titles to appear in part 1 of this new third print edition can be viewed at mrw interscience wiley com epst and clicking on what s new check this website often as new articles are added periodically

engineering of polymers is not an easy exercise with evolving technology it often involves complex concepts and processes this book is intended to provide the theoretical essentials understanding of processes a basis for the use of design software and much more the necessary physical concepts such as continuum mechanics rheological behavior and measurement methods and thermal science with its application to heating cooling problems and implications for flow behavior are analyzed in detail this knowledge is then applied to key processing methods including single screw extrusion and extrusion die flow twin screw extrusion and its applications injection molding calendering and processes involving stretching with many exercises with solutions offered throughout the book to reinforce the concepts presented and extensive illustrations this is an essential guide for mastering the art of plastics processing practical and didactic polymer processing principles and modeling is intended for engineers and technicians of the profession as well as for advanced students in polymer science and plastics engineering

this book addresses traditional polymer processing as well as the emerging technologies associated with the plastics industry in the 21st century and combines engineering modeling aspects with computer simulation of realistic polymer processes this book is designed to provide a polymer processing background to engineering students and practicing engineers this three part textbook is written for a two semester polymer processing series in mechanical and chemical engineering the first and second part of the book are designed for a senior to graduate level course introducing polymer processing and the third part is for a graduate course on simulation in polymer processing throughout the book many applications are presented in form of examples and illustrations these will also serve the practicing engineer as a guide when determining important parameters and factors during the design process or when optimizing a process examples are presented throughout the book and problems and solutions are available contents introduction part i background polymer material science processing properties polymer processes part ii processing fundamentals dimensional analysis and scaling transport phenomena in polymer processing analyses based on analytical solutions part iii numerical techniques introduction to numerical analysis finite differences method finite element method boundary element method radial functions method

this third edition is a completely new version in a new century of the encyclopedia of polymer science and technology the new edition will bring the state of the art up to the 21st century with coverage of nanotechnology new imaging and analytical techniques new methods of controlled

polymer architecture biomimetics and more new topics covered include nanotechnology afm maldi biomimetics and genetic methods of increasing importance since 1990 and will also bring up to date coverage of traditional topics of continuing interest this edition will publish in 3 parts of 4 volumes each each part will be an a z selection of the newest articles available in the online edition of this encyclopedia a list of the titles to appear in part i can be viewed by clicking what s new at mrw interscience wiley com epst titles for parts ii and iii will appear there as well when available

entirely rewritten this multi volume work has been expanded to reflect the vast changes that have occurred in polymer and plastics technology over the past twenty years a total of 17 volumes were published through 1988 a supplement and an index volume will contains approximately 850 pages including about 200 tables and 3 000 literature citations over 100 new subjects were introduced in the new edition coverage includes natural and synthetic polymers plastics fibers elastomers computer topics and processing

state of the art guide to plastic product design manufacture and application edited by charles a harper and sponsored by modern plastics the industry s most prestigious trade magazine modern plastics handbook packs a wealth of up to date knowledge about plastics processes forms and formulations design equipment testing and recycling this a to z guide keeps you on top of properties and performance of thermoplastics polymer blends thermosets reinforced plastics and composites natural and synthetic elastomers processes from extrusion injection and blow molding to thermoforming foam processing hand lay up and filament winding and many many more fabricating post production finishing and bonding coatings and finishes subjects difficult to find treated elsewhere in print more

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