



Polymers from the Inside Out

An Introduction to Macromolecules

Alan E. Tonelli
with Mohan Srinivasarao

Polymers From The Inside Out An Introduction To Macromolecules Hardcover

Jin-Ying Zhang



Polymers From The Inside Out An Introduction To Macromolecules Hardcover:

Polymers From the Inside Out Alan E. Tonelli, Mohan Srinivasarao, 2001-04-16 An introduction to polymers and how they dominate our world Polymer science is concerned with the structure synthesis physical properties and utility of polymers Polymers are macromolecular building blocks used to construct natural and man made materials Polymers from the Inside Out An Introduction to Macromolecules provides an all encompassing introduction to polymers and how they affect the world Offering a clear explanation of the unique properties exhibited by polymers this book explores the detailed microstructures of polymers and their internal responses to stress and the environment Polymers from the Inside Out appeals to a wide range of disciplines including polymer organic materials and physical chemistry as well as textile science and engineering Chapters include Physical properties unique to polymeric materials Step growth and chain growth polymerizations Microstructures of polymers Conformational characteristics of polymers developed with the rotational isomeric states model Solution and bulk properties of polymers Biopolymers Discussion questions appropriate for first and second semester polymer students at the end of every chapter Polymers from the Inside Out is designed to facilitate either a one semester or two semester course on polymers and is an essential resource for the practicing scientist **New Scientist** ,1973-07 Books in Print Supplement

,1984 **An Introduction to Macromolecules** Leo Mandelkern,1983 **Macromolecules** Frank Alden Bovey, Field Howard Winslow,1982 An Introduction to Macromolecules L. Mandelkern,1983-09-27 The reception of the original volume by students pedagogues and reviewers has been most gratifying It appears to have both satisfied a need and served a useful educational purpose Hence some ten years later it has been deemed advisable to bring it up to date if only in a slightly expanded form The purpose for writing this book and its level remain the same Many new polymers have been synthesized in the last decade that have found meaningful and novel uses Examples of these applications are included in this new edition Major advances have also been made in biophysics and in molecular biology as well as in our understanding of natural processes on a molecular level Foremost among these has been the development of recombinant DNA technology With it has come the potential for large scale synthesis of hormones and proteins These new developments have also been incorporated into the present volume It is my hope that this new edition will still have a widespread appeal to students in all of the natural sciences whatever their major interest It should also be of use and interest to those starting industrial or academic careers who have not had an extensive background in macromolecular science **Introduction to Macromolecular Science** Petr Munk,1989-09-14 An introduction to macromolecular chemistry covering the structure of macromolecules their properties their applications how they are made and methods used for studying them Includes discussion of synthetic materials as well as important biological entities Physical and chemical aspects are addressed with a minimum of mathematics An Introduction to Polymer Science Hans-Georg Elias,1997 **Macromolecules** ,1972 **Chain Structure and Conformation of Macromolecules** Frank Bovey,2012-12-02 Chain Structure and Conformation of Macromolecules

provides an introduction to the chain structures of synthetic polymers and their determination in solution and in the solid state This book discusses the synthetic methods and polymerization mechanisms Organized into eight chapters this book begins with an overview of the brief history of the macromolecular concept and of stereochemical and geometrical isomerism in synthetic polymer chains This text then introduces vibrational spectroscopy and nuclear magnetic resonance spectroscopy Other chapters consider the geometric isomerism in diene copolymers as well as the rotational isomeric state method of calculation of polymer chain dimensions This book discusses as well copolymerization and the measurement of copolymer structure The final chapter deals with the NMR observation of polymers in the solid state by the method of magic angle spinning by which both dynamic measurements and high resolution structural information are possible This book is a valuable resource for organic chemists chemical engineers and research workers

Giant Molecules A. I?U. Grosberg, A. R. Khokhlov, Pierre-Gilles de Gennes, 2011 Giant molecules are important in our everyday life But as pointed out by the authors they are also associated with a culture What Bach did with the harpsichord Kuhn and Flory did with polymers We owe a lot of thanks to those who now make this music accessible Pierre Gilles de Gennes Nobel Prize laureate in Physics Foreword for the 1st Edition March 1996 This book describes the basic facts concepts and ideas of polymer physics in simple yet scientifically accurate terms In both scientific and historic contexts the book shows how the subject of polymers is fascinating as it is behind most of the wonders of living cell machinery as well as most of the newly developed materials No mathematics is used in the book beyond modest high school algebra and a bit of freshman calculus yet very sophisticated concepts are introduced and explained ranging from scaling and reptations to protein folding and evolution The new edition includes an extended section on polymer preparation methods discusses knots formed by molecular filaments and presents new and updated materials on such contemporary topics as single molecule experiments with DNA or polymer properties of proteins and their roles in biological evolution

Macromolecules • 1 H.G. Elias, 2012-12-06 The second edition of this textbook is identical with its fourth German edition and it thus has the same goals precise definition of basic phenomena a broad survey of the whole field integrated representation of chemistry physics and technology and a balanced treatment of facts and comprehension The book thus intends to bridge the gap between the often oversimplified introductory textbooks and the highly specialized texts and monographs that cover only parts of macromolecular science The text intends to survey the whole field of macromolecular science Its organization results from the following considerations The chemical structure of macromolecular compounds should be independent of the method of synthesis at least in the ideal case Part I is thus concerned with the chemical and physical structure of polymers Properties depend on structure Solution properties are thus discussed in Part II solid state properties in Part III There are other reasons for discussing properties before synthesis For example it is difficult to understand equilibrium polymerization without knowledge of solution thermodynamics the gel effect without knowledge of the glass transition temperature etc Part IV treats the principles of macromolecular syntheses and

reactions *Macromolecules in Solution* Herbert Morawetz,1983 **Macromolecules** Hans-Georg Elias,2005-10-28

Macromolecules provides a broad survey of the entire subject integrated representations of chemistry physics and technology precise descriptions and definitions of basic phenomena and balanced treatments of facts and theory The book series thus intends to bridge the gap between introductory textbooks and the highly specialized texts and monographs that cover only part of polymer science and technology Volume I is concerned with the fundamentals of chemical structure and principles of synthesis of macromolecules constitution configuration conformation polymerization equilibria polymerization mechanisms ionic coordination free radical step reactions including solid state and biochemical polymerizations polymer reactions and strategies for defined polymer architectures Volume II discusses individual polymers and their industrial syntheses Volume III the fundamentals of physical structures and properties and Volume IV the processing and application of polymers as plastics fibers elastomers thickeners etc The world of macromolecules in a nutshell **Hierarchical**

Macromolecular Structures: 60 Years after the Staudinger Nobel Prize II Virgil Percec,2014-07-08 Advances in Polymer Science enjoys a longstanding tradition and good reputation in its community Each volume is dedicated to a current topic and each review critically surveys one aspect of that topic to place it within the context of the volume The volumes typically summarize the significant developments of the last 5 to 10 years and discuss them critically presenting selected examples explaining and illustrating the important principles and bringing together many important references of primary literature On that basis future research directions in the area can be discussed Advances in Polymer Science volumes thus are important references for every polymer scientist as well as for other scientists interested in polymer science as an introduction to a neighboring field or as a compilation of detailed information for the specialist **Macromolecules** H.G. Elias,2013-11-11 The second edition of this textbook is identical with its fourth German edition and it thus has the same goals precise definition of basic phenomena a broad survey of the whole field integrated representation of chemistry physics and technology and a balanced treatment of facts and comprehension The book thus intends to bridge the gap between the often oversimplified introductory textbooks and the highly specialized texts and monographs that cover only parts of macromolecular science The text intends to survey the whole field of macromolecular science Its organization results from the following considerations The chemical structure of macromolecular compounds should be independent of the method of synthesis at least in the ideal case Part I is thus concerned with the chemical and physical structure of polymers Properties depend on structure Solution properties are thus discussed in Part II solid state properties in Part III There are other reasons for discussing properties before synthesis For example it is difficult to understand equilibrium polymerization without knowledge of solution thermodynamics the gel effect without knowledge of the glass transition temperature etc Part IV treats the principles of macromolecular syntheses and reactions **Macromolecules** H.G. Elias,2013-10-20 The second edition of this textbook is identical with its fourth German edition and it thus has the same goals precise definition of basic phenomena

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Macromolecules: Synthesis, Order and Advanced Properties, 2014-03-12 **Macromolecular Syntheses**

Charles Gilbert Overberger, 1980 Macromolecules Hans-Georg Elias, 2009-08-24 Providing a broad survey of the entire field Macromolecules integrates representations of chemistry physics and technology as well as including precise descriptions of basic phenomena and balanced treatments of facts and theory

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