Record Nr.	UNINA9910877346603321
Autore	Sperling L. H (Leslie Howard), <1932->
Titolo	Introduction to physical polymer science / / L.H. Sperling
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2006
ISBN	1-119-10374-6 1-280-28692-X 9786610286928 0-470-35872-6 0-471-75712-8 0-471-75711-X
Edizione	[4th ed.]
Descrizione fisica	1 online resource (877 p.)
Disciplina Soggetti	547.7 668.9 Polymers
	Polymerization
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	INTRODUCTION TO PHYSICAL POLYMER SCIENCE; CONTENTS; Preface to the Fourth Edition; Preface to the First Edition; Symbols and Definitions; 1 Introduction to Polymer Science; 1.1 From Little Molecules to Big Molecules; 1.2 Molecular Weight and Molecular Weight Distributions; 1.3 Major Polymer Transitions; 1.4 Polymer Synthesis and Structure; 1.5 Cross-Linking, Plasticizers, and Fillers; 1.6 The Macromolecular Hypothesis; 1.7 Historical Development of Industrial Polymers; 1.8 Molecular Engineering; References; General Reading; Handbooks, Encyclopedias, and Dictionaries; Web Sites; Study Problems Appendix 1.1 Names for Polymers2 Chain Structure and Configuration; 2.1 Examples of Configurations and Conformations; 2.2 Theory and Instruments; 2.3 Stereochemistry of Repeating Units; 2.4 Repeating Unit Isomerism; 2.5 Common Types of Copolymers; 2.6 NMR in Modern Research; 2.7 Multicomponent Polymers; 2.8 Conformational States in Polymers; 2.9 Analysis of Polymers during Mechanical Strain; 2.10 Photophysics of Polymers; 2.11 Configuration and Conformation; References; General Reading; Study Problems; Appendix 2.1 Assorted

1.

	Isomeric and Copolymer Macromolecules
	3 Dilute Solution Thermodynamics, Molecular Weights, and Sizes3.1 Introduction; 3.2 The Solubility Parameter; 3.3 Thermodynamics of Mixing; 3.4 Molecular Weight Averages; 3.5 Determination of the Number-Average Molecular Weight; 3.6 Weight-Average Molecular Weights and Radii of Gyration; 3.7 Molecular Weights of Polymers; 3.8 Intrinsic Viscosity; 3.9 Gel Permeation Chromatography; 3.10 Mass Spectrometry; 3.11 Instrumentation for Molecular Weight Determination; 3.12 Solution Thermodynamics and Molecular Weights; References; General Reading; Study Problems Appendix 3.1 Calibration and Application of Light-Scattering Instrumentation for the Case Where P(q) = 14 Concentrated Solutions, Phase Separation Behavior, and Diffusion; 4.1 Phase Separation and Fractionation; 4.2 Regions of the Polymer-Solvent Phase Diagram; 4.3 Polymer-Polymer Phase Separation; 4.4 Diffusion and Permeability in Polymers; 4.5 Latexes and Suspensions; 4.6 Multicomponent and Multiphase Materials; References; General Reading; Study Problems; Appendix 4.1 Scaling Law Theories and Applications; 5 The Amorphous State; 5.1 The Amorphous Polymer State 5.2 Experimental Evidence Regarding Amorphous Polymers5.3 Conformation of the Polymer Chain; 5.4 Macromolecular Dynamics; 5.5 Concluding Remarks; References; General Reading; Study Problems; Appendix 5.2 Calculations Using the Diffusion Coefficient; Appendix 5.3 Nobel Prize Winners in Polymer Science and Engineering; 6 The Crystalline State; 6.1 General Considerations; 6.2 Methods of Determining Crystal Structure; 6.3 The Unit Cell of Crystalline Polymers; 6.4 Structure of Crystalline Polymers; 6.5 Crystallization from the Melt 6.6 Kinetics of Crystallization
Sommario/riassunto	An Updated Edition of the Classic TextPolymers constitute the basis for the plastics, rubber, adhesives, fiber, and coating industries. The Fourth Edition of Introduction to Physical Polymer Science acknowledges the industrial success of polymers and the advancements made in the field while continuing to deliver the comprehensive introduction to polymer science that made its predecessors classic texts. The Fourth Edition continues its coverage of amorphous and crystalline materials, glass transitions, rubber elasticity, and mechanical behavior, and offers updated discussions of