

1. Record Nr.	UNINA9910830938703321
Titolo	Oriented polymer materials [[electronic resource] /] / edited by Stoyko Fakirov
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, 2002
ISBN	1-281-84269-9 9786611842697 3-527-61505-9 3-527-61504-0
Descrizione fisica	1 online resource (536 p.)
Altri autori (Persone)	FakirovStoyko
Disciplina	547.84 620.192
Soggetti	Polymers
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	Oriented Polymer Materials; CONTENTS; Chapter 1. Problems of the physics of the oriented state of polymers; 1 . Introductory considerations; 1.1. Interplay of fundamental and applied problems . Molecular cybernetics; 1.2. Principal routes to the formation of uniaxially oriented structures in polymers; 2 . Configurational information and orientation phenomena in synthetic polymers; 2.1. Direct generation of orientational order from solutions and melts . Orientational hardening, orientational crystallization, and orientational catastrophes; 2.2. Assemblage; liquid crystalline polymers 2.3. Reconstruction3. Failure under load; 4. Some specific properties of superoriented polymers; 5. Technological implications; 6. General conclusions and summary; 6.1. What is clear?; 6.2. What is incomprehensible?; 6.3. What needs better understanding?; References; Chapter 2. Structural basis of high-strength high-modulus polymers; 1. Introduction; 2. Structural transformation in semicrystalline polymers on stretching; 2.1. Deformation mechanisms at small strain; 2.2. Folded-extended chain solid phase transition in the neck region 2.3. Micro- and macrofibrillar structure in oriented polymers and its plastic deformation2.4. Drawing arrest and fracture of oriented

polymers; 2.5. Alternative mechanisms of drawing; 3. Deformation-induced strengthening of semicrystalline polymers; 3.1. Structural kinetic approach to the enhancement of polymer characteristics by deformation; 3.2. Physical criteria for the optimization of the drawing process; 3.3. Optimal molecular weight and molecular weight distribution; 4. Mechanical properties of highly oriented polymers; 5. Thermal properties of superstrong high-modulus polymers; 6. Structural peculiarities of highly oriented polymers; References; Chapter 3. X-ray diffraction by quasiperiodic polymer structures; 1. Introduction; 2. Qualitative phenomenological aspects; 2.1. Fibre diagrams; 2.2. Crystal density, chain cross section and chain conformation; 2.3. Anisotropy perpendicular to the chain direction, planes of plates; 2.4. Position sphere; 2.5. Lattice distortions of the first and second kind. Distortion parameter; 2.6. Special lattice types; 2.7. Small-angle scattering, fibrils, layer lattices; 3. Basics of experiments; 3.1. X-ray spectrum and absorption; 4. Theoretical relationships; 4.1. Structure factor; 4.2. The Ewald sphere; 4.3. Pair distribution; 4.4. A special application example; 5. Simple lattice models; 5.1. Ideal periodic lattices; 5.2. Distortions of the first kind; 5.3. Distortions of the second kind; 5.4. Inhomogeneous coordination statistics; References; Chapter 4. Characterization of polymer deformation by vibrational spectroscopy; 1. Introduction; 2. Experimental and instrumentation; 3. Orientational measurements by infrared dichroism; 4. Segmental mobility in liquid crystalline side-chain polymers; 5. Rheo-optical FT-IR studies of the poly(ethylene terephthalate) film forming process
