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2.4. 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
