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| Nota di contenuto | Modern Polymer Spectroscopy; Contents; 1 Two-Dimensional Infrared Spectroscopy; 1.1 Introduction; 1.2 Background; 1.3 Basic Properties of 2D Correlation Spectra; 1.4 Instrumentation; 1.5 Applications; 2 Segmental Mobility of Liquid Crystals and Liquid-Crystalline Polymers Under External Fields: Characterization by Fourier-Transform Infrared Polarization Spectroscopy; 2.1 Introduction; 2.2 Measurement Techniques; 2.3 Theory; 2.4 Structure Dependent Alignment of Side-Chain Liquid-Crystalline Polyacrylates on Anisotropic Surfaces 2.5 Electric-Field Induced Orientation and Relaxation of Liquid-Crystalline Systems2.6 Alignment of Side-Chain Liquid-Crystalline Polyesters Under Laser Irradiation; 2.7 Orientation of Liquid-Crystals Under Mechanical Force; 2.8 Conclusions; 3 Vibrational Spectra as a Probe of Structural Order/Disorder in Chain Molecules and Polymers; 3.1 Introduction; 3.2 The Dynamical Case of Small and Symmetric Molecules; 3.3 How to Describe the Vibrations of a Molecule; 3.4 Short and Long Range Vibrational Coupling in Molecules; 3.5 Towards Larger Molecules: From Oligoiners to Polymers |

3.6 From Dynamics to Vibrational Spectra of One-Dimensional Lattices; 3.7 The Case of Isotactic Polypropylene - A Textbook Case; 3.8 Density of Vibrational States and Neutron Scattering; 3.9 Moving Towards Reality: From Order to Disorder; 3.10 What Do We Learn from Calculations; 3.11 A Very Simple Case: Lattice Dynamics of HCl-DCI Mixed Crystals; 3.12 CIS-tram Opening of the Double Bond in the Polymerisation of Ethylene; 3.13 Defect Modes as Structural Probes in Polymethylene Chains; 3.14 Case studies; Case 1 Conformational Mapping of Fatty Acids Through Mass Defects Case 2 Liquid Crystalline Polymers: Polyesters Case 3 Chain Folding in Polyethylene Single Crystals; Case 4 The Structure of the Skin and Core in Polyethylene Films (Normal and Ultradrawn); Case 5 Moving Towards More Complex Polymethylene Systems; 3.15 Simultaneous Configurational and Conformational Disorder. The case of Polyvinylchloride; 3.16 Structural Inhomogeneity and Raman Spectroscopy of LAM Modes; 3.17 Fermi Resonances; 3.18 Band Broadening and Conformational Flexibility; 3.19 A Worked Out Example: From N-Alkanes to Polyethylene. Structure and Dynamics 4 Vibrational Spectroscopy of Intact and Doped Conjugated Polymers and Their Models 4.1 Introduction; 4.2 Materials; 4.3 Geometry of Intact Polymers; 4.4 Geometrical Changes Introduced by Doping; 4.5 Methodology of Raman Studies of Polarons, Bipolarons and Solitons; 4.6 Near Infrared Raman Spectroscopy; 4.7 Poly(p-phenylene); 4.8 Other Polymers; 4.9 Electronic Absorption and ESR Spectroscopies and Theory; 4.10 Mechanism of Charge Transport; 4.11 Summary; 5 Vibrational Spectroscopy of Polypeptides; 5.1 Introduction; 5.2 Force Fields; 5.3 Amide Modes; 5.4 Polypeptides; 5.5 Summary; Index

Sommario/riassunto

Modern Polymer Spectroscopy provides a 'guided tour' to the state of the art in polymer analysis by vibrational spectroscopy. Five renowned experts describe new experimental and theoretical techniques. Areas of focus include:- two-dimensional infrared spectroscopy- segmental mobility of liquid crystalline polymers under external fields- dynamics and structure of polymers with chemical and structural disorder- spectra of polyconjugated conducting polymers- theoretical calculations on biopolymers. Readers learn experimental techniques and theoretical tools essential for ob
