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| Nota di contenuto | Liquid Crystals: Viscous and Elastic Properties; Contents; Preface; 1 Introduction; References; 2 Physical Backgrounds for Practical Applications of Liquid Crystals; 2.1 Anisotropy of Physical Properties of Liquid Crystals; 2.1.1 Liquid Crystal Molecules and Phases; 2.1.2 Nonliquid Crystal Compounds; 2.1.3 Typical Methods of Liquid Crystal Material Preparation for Various Applications; 2.1.4 Basic Physical Properties; 2.1.4.1 Dielectric Properties; 2.1.4.2 Optical Anisotropy; 2.1.4.3 Viscoelastic Properties; 2.1.4.4 Elasticity; 2.1.4.5 Viscosity; 2.2 Liquid Crystal Alignment on the Surface 2.2.1 Types of Liquid Crystal Alignment 2.2.1.1 Electrooptical Cells; 2.2.1.2 Planar (Homogeneous) Orientation; 2.2.1.3 Homeotropic Orientation; 2.2.1.4 Tilted Orientation; 2.2.1.5 Other Types of Liquid Crystal Alignment; 2.2.2 Surface Energy; 2.3 Liquid Crystals Under Magnetic and Electric Fields; References; 3 Flows of Anisotropic Liquids; 3.1 Couette and Poiseuille Flows in Isotropic Liquids and Liquid Crystals; 3.2 Hydrodynamic Instabilities in Couette and Poiseuille Steady Shear Flows; 3.3 Steady Flows of Liquid Crystals |

3.3.1 Homogeneous Instability at Initial Planar Orientation Normal to the Flow Plane; 3.3.2 Periodic Instability at Initial Planar Orientation Normal to the Flow Plane; 3.3.3 Instability at Initial Planar Orientation in the Flow Plane; 3.3.4 Hydrodynamic Instabilities at Initial Homeotropic Orientation; 3.3.5 Orientational Instability in a Nematic Liquid Crystal in a Decaying Poiseuille Flow; 3.3.6 Influence of a Decay Flow on Electrohydrodynamic Instability in Liquid Crystals; 3.4 Hydrodynamic Instabilities Under Oscillating Flows; 3.4.1 Oscillating Couette Flow; 3.4.2 Oscillating Poiseuille Flow: Planar Orientation; 3.4.3 Oscillating Poiseuille Flow: Homeotropic Orientation; 3.4.3.1 Experimental Setup for Low-Frequency Poiseuille Flow; 3.4.3.2 Linear In-Plane Motion of a Director Under Oscillating Poiseuille Flow; 3.4.3.3 Hydrodynamic Instabilities Under Oscillating Poiseuille Flows; 3.5 Secondary Instabilities in Poiseuille Flows; 3.5.1 Domain Walls; 3.5.2 Secondary Roll Instability in Oscillating Flow; 3.5.3 Long-Living Domains Produced by Flows; 3.6 Shear Flows at Weak Anchoring; 3.6.1 Linear Oscillating Flows at Weak Anchoring; 3.6.1.1 General Equations; 3.6.1.2 Linear Oscillating Flow at Symmetrical Boundary Conditions; 3.6.1.3 Linear Oscillating Flow at Hybrid Boundary Conditions; 3.6.1.4 Experimental Technique and Results; 3.6.2 Hydrodynamic Instabilities at Weak Anchoring; References; 4 Ultrasound in Liquid Crystals; 4.1 Methods and Technique of Ultrasonic Investigations of Liquids and Liquid Crystals: Longitudinal Waves; 4.1.1 Impulse Method; 4.1.2 Resonator Method; 4.1.3 Ultrasonic Technique for the Study of Liquid Crystals; 4.1.3.1 Peculiarities of Ultrasonic Investigations of Liquid Crystals; 4.1.3.2 Ultrasonic Chambers for the Study of Liquid Crystals

Sommario/riassunto

Covering numerous practical applications as yet not covered in any single source of information, this monograph discusses the importance of viscous and elastic properties for applications in both display and non-display technologies. The very well-known authors are major players in this field of research and pay special attention here to the use of liquid crystals in fiber optic devices as applied in telecommunication circuits.
