

1. Record Nr.	UNINA9910828777503321
Titolo	Flexoelectricity in liquid crystals : theory, experiments and applications // edited by Agnes Buka and Nandor Eber
Pubbl/distr/stampa	Singapore ; ; London, : World Scientific, c2013
ISBN	1-283-73918-6 1-84816-800-4
Edizione	[1st ed.]
Descrizione fisica	1 online resource (299 p.)
Altri autori (Persone)	BukaAgnes EberMilton
Disciplina	548.85
Soggetti	Liquid crystals - Electric properties Liquid crystals
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 index.
Nota di contenuto	Preface; Contents; Introduction to Flexoelectricity: Its Discovery and Basic Concepts R.B. Meyer; References; 1. Molecular Theory of Flexoelectricity in Nematic Liquid Crystals M.A. Osipov; 1.1. Introduction; 1.2. Dipolar and Quadrupolar Flexoelectricity; 1.3. Density Functional Theory of Flexoelectricity; 1.4. Influence of Polar Molecular Shape on the Flexocoefficients; 1.5. Influence of Dipole-Dipole Correlations; 1.6. Influence of Real Molecular Shape; References; 2. Flexoelectro-optics and Measurements of Flexocoefficients N.V. Madhusudana; 2.1. Introduction; 2.2. Theoretical Background 2.3. Experimental Techniques 2.4. Some Remarks on the Experimental Results; References; 3. Flexoelectricity of Bent-core Molecules A. Jakli, J. Harden and N. Eber; 3.1. Introduction; 3.1.1. Bent-core (banana-shaped) liquid crystals; 3.1.2. Bent-core nematics; 3.2. Flexoelectricity in Bent-core Liquid Crystals; 3.2.1. The flexoelectric coefficients; 3.2.2. A direct flexing method for measuring flexoelectric coefficients; 3.2.3. Giant flexoelectricity of bent-core nematics studied by the flexing method; 3.3. The Inverse (Converse) Flexoelectric Effect; 3.3.1. Converse giant flexoelectric effect 3.3.2. Flexoelectricity of bent-core molecules studied by indirect methods 3.4. Physical Origin of Giant Flexoelectricity; 3.5. Giant Flexoelectric Effect in Liquid Crystalline Elastomers; Acknowledgments;

References; 4. The Role of Flexoelectricity in Pattern Formation A. Buka, T. Toth-Katona, N. Eber, A. Krekhov and W. Pesch; 4.1. Introduction; 4.2. Equilibrium Structures: Flexodomains; 4.3. Dissipative Structures: Electroconvection; 4.3.1. Standard electroconvection; 4.3.2. Non-standard electroconvection; 4.4. Crossover between Flexodomains and Electroconvection 4.5. Discussions and Conclusions Acknowledgements; References; 5. Flexoelectricity in Chiral Polar Smectics M. Cepic; 5.1. Introduction; 5.2. Ferroelectric Liquid Crystals; 5.2.1. Phenomenological modelling of chiral tilted smectics; 5.2.2. Polar properties and flexoelectricity; 5.3. Antiferroelectric Liquid Crystals; 5.3.1. Structures of phases; 5.3.1.1. The ferroelectric SmC* phase; 5.3.1.2. The antiferroelectric SmC* A phase; 5.3.1.3. The incommensurate SmC* a phase; 5.3.1.4. The antiferroelectric SmC* FI2 phase; 5.3.1.5. The ferroelectric SmC* FI1 phase; 5.3.1.6. The six-layer SmC* 6d phase 5.3.2. Discrete model 5.3.3. Discrete form of flexoelectricity; 5.3.4. Lock-in periodicities; 5.3.4.1. Achiral interactions a1; 5.3.4.2. Achiral interactions a2; 5.3.4.3. Achiral interactions a3; 5.3.4.4. Chiral interactions f1; 5.3.4.5. Chiral interactions f2; 5.3.4.6. Quadrupolar biquadratic interactions bQ; 5.3.4.7. Period two: The SmC* FI2 phase; 5.3.4.8. Period three: The SmC* FI1 and the SmC* 6d phases; 5.4. Flexoelectricity in Complex Structures; 5.4.1. General direction of polarization; 5.4.2. On the observability of flexoelectric polarization; 5.5. Conclusions; References 6. Flexoelectricity in Lyotropics and in Living Liquid Crystals A.G. Petrov

Sommario/riassunto

The book intends to give a state-of-the-art overview of flexoelectricity, a linear physical coupling between mechanical (orientational) deformations and electric polarization, which is specific to systems with orientational order, such as liquid crystals. Chapters written by experts in the field shed light on theoretical as well as experimental aspects of research carried out since the discovery of flexoelectricity. Besides a common macroscopic (continuum) description the microscopic theory of flexoelectricity is also addressed. Electro-optic effects due to or modified by flexoelectricity as we
