

1. Record Nr.	UNISA996199397203316
Titolo	Physical properties of liquid crystals [[electronic resource] /] / [edited by] D. Demus ... [et al.]
Pubbl/distr/stampa	Weinheim ; ; New York, : Wiley-VCH, c1999
ISBN	1-282-28241-7 9786612282416 3-527-61394-3 3-527-61395-1
Descrizione fisica	1 online resource (526 p.)
Altri autori (Persone)	DemusDietrich
Disciplina	530.4/29 530.429
Soggetti	Liquid crystals Polymer 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	Physical Properties of Liquid Crystals; Contents; Chapter I: Introduction and Historical Development; 1 Introduction; 2 The Early Years up to About 1925; 3 The Second Phase from 1925 to 1959; 4 The Third Phase from 1960 to the Present Time; 4.1 Lyotropic Liquid Crystals; 4.2 Theory; 4.3 Polymer Dispersed Liquid Crystals (PDLCs) and Anchoring; 4.4 Materials and New Phases; 5 Conclusions; 6 References; Chapter II: Guide to the Nomenclature and Classification of Liquid Crystals; 1 Introduction; 2 General Definitions; 3 Structural Features; 4 Polymeric Liquid Crystals 5 Notation of Thermotropic Liquid Crystalline Properties5 .1 Description of the Solid State; 5.1.1 Description of Soft Crystals; 5.2 Description of the Liquid Crystalline Phases; 5.2.1 Nematic and Chiral Nematic Phases; 5.2.2 Smectic Liquid Crystals; 5.2.3 Chiral Smectic Liquid Crystals; 5.2.4 Columnar Phases; 5.2.5 Plastic Crystals; 5.2.6 Condis Crystals; 5.2.7 Cubic; 5.2.8 Re-entrants; 5.3 Description of the Clearing Parameters; 6 Stereochemistry; 7 References; Chapter III: Theory of the Liquid Crystalline State; 1 Continuum Theory for Liquid Crystals; 1.1 Introduction

1.2 Equilibrium Theory for Nematics
1.2.1 The Frank-Oseen Energy;
1.2.2 A Virtual Work Formulation; 1.2.3 Body Forces and Moments;
1.2.4 The Equilibrium Equations; 1.2.5 Boundary Conditions; 1.2.6
Proposed Extensions; 1.3 Equilibrium Theory for Smectic Liquid
Crystals; 1.3.1 An Energy Function for SmC Liquid Crystals; 1.3.2
Equilibrium Equations; 1.4 Dynamic Theory for Nematics; 1.4.1 Balance
Laws; 1.4.2 A Rate of Work Hypothesis; 1.4.3 The Viscous Stress; 1.4.4
Equations of Motion; 1.5 References; 2 Molecular Theories of Liquid
Crystals; 2.1 Introduction
2.2 Microscopic Definition of the Order Parameters for Nematic and
Smectic Phases
2.2.1 Uniaxial Nematic Phase; 2.2.2 Biaxial Nematic
Phase; 2.2.3 Smectic A and C Phases; 2.3 Anisotropic Intermolecular
Interactions in Liquid Crystals; 2.3.1 Hard-core Repulsion; 2.3.2
Electrostatic and Dispersion Interactions; 2.3.3 Model Potentials; 2.4
Molecular Theory of the Nematic Phase; 2.4.1 Mean-field
Approximation and the Maier-Saupe Theory; 2.4.2 Short-range
Orientational Correlations; 2.4.3 Excluded Volume Effects and the
Onsager Theory; 2.4.4 Packing Effects in Thermotropic Nematics
2.4.5 The Role of Molecular Biaxiality
2.4.6 Density Functional Approach
to the Statistical Theory of Liquid Crystals; 2.5 Molecular Models for
Simple Smectic Phases; 2.5.1 Mean-field Theory of the Nematic-
Smectic A Transition; 2.5.2 Phase Diagram of a Hard-rod Fluid; 2.5.3
The Role of Intermolecular Attraction; 2.5.4 Smectic A-Smectic C
Transition; 2.6 Conclusions; 2.7 References; 3 Molecular Modelling; 3.1
Techniques of Molecular Modelling; 3.1.1 Molecular Mechanics; 3.1.2
Molecular Dynamics and Monte Carlo Simulation; 3.1.3 Quantum
Mechanical Techniques
3.2 Applications of Molecular Modelling

Sommario/riassunto

This handbook is a unique compendium of knowledge on all aspects of the physics of liquid crystals. In over 500 pages it provides detailed information on the physical properties of liquid crystals as well as the recent theories and results on phase transitions, defects and textures of different types of liquid crystals. An in-depth understanding of the physical fundamentals is a prerequisite for everyone working in the field of liquid crystal research. With this book the experts as well as graduate students entering the field get all the information they need.
