



METADATA

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Abstract

The term "liquid crystal" describes the state of matter, whose properties are between the isotropic liquid and crystalline solid. Since their discovery, at the end of the 19th century, by F. Reinitzer (1888) and O. Lehmann (1889), there have been thousands of compounds that they present this unusual and at the same time very interesting liquid crystals or mesophase state of matter. The fundamental condition for liquid crystallinity is that the molecule presents a high degree of anisotropy in its shape. Anisotropy in shape also leads to dielectric anisotropy and optical anisotropy, which are the main features in imaging technologies. Depending on the nature of the molecular structure, a compound may pass through one or several different liquid crystalline phases, characterized by order and symmetry, before the conversion in an isotropic liquid. There are two general categories of liquid crystals, thermotropic liquid crystals that occur through thermal transitions and lyotropic liquid crystals that occur from the solubility variation. The molecules of liquid crystals are mainly distinguished either in rod-like or calamitic or discotic. For the past 40 years, liquid crystals have been applied in optical displays, known as

liquid crystal displays or LCDs. Today, liquid crystals rule the roost in the global flat panel display market, from laptop to desktop displays to more recently, with penetration into the large television market. Because of the technological advancement in this field, researchers specializing in Liquid Crystal Science and Technology are oriented towards new applications through the characteristic and strong electro-optical properties of liquid crystals. The book is divided in 9 chapters, including: In the first chapter, the states of matter, a brief introduction to liquid crystals, an overview on the discovery of liquid crystals and a brief historical overview. In the second chapter, the classification of all categories and types of liquid crystals. In the third chapter, polymeric liquid crystals. In the fourth chapter, a brief review regarding the chemistry of thermotropic liquid crystals and the effects of their structural groups on the type of mesophase and the methods of their characterization. In the fifth chapter, the main theoretical approaches in relation to the formation of liquid crystalline phases. In the sixth chapter, the optical and other physical properties of thermotropic liquid crystals. In the

