

International Union of Crystallography

Report of the Executive Committee for 1976

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(1977), A33, 1028–1042]. It reports on the meetings and publications of the Union, the work of its Commissions, and the work of bodies not belonging to the Union but on which the Union is represented.

Book Review

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Liquid crystals. By S. CHANDRASEKHAR. Pp. x + 342, Figs. 158, Plates 16. Cambridge Univ. Press, 1977. Price £18.00.

This book is concerned with liquid crystals, the strongly anisotropic, but fluid, states which a large number of organic materials are now known to form and which possess degrees of order intermediate between those of the crystalline solid and the amorphous liquid. Although the title is a general one, the work refers only briefly to lyotropic liquid crystals and concentrates strongly on liquid crystals formed by thermal effects on pure materials or their mixtures – the so-called thermotropic systems. Even here there is a bias, for smectic liquid crystals feature in only one of the four main chapters (additional to the brief introduction), whereas 258 pages are devoted to nematic and the related cholesteric liquid crystals.

Statistical theories of nematic order and continuum theory of the nematic state are dealt with fully in Chapters 2 and 3, respectively. These fairly complex matters are covered lucidly, and it is valuable to have these theories and their implications, on which the published work is scattered rather widely throughout the scientific literature, discussed concisely and logically between two covers. The latter part of Chapter 3 on the relationships between theory and the physical behaviour of nematics is very useful, particularly as it considers, in detail, disclinations and matters such as the twisted nematic cell, the Fréedericksz effect and electrohydrodynamics, all of which are of importance in relation to the application of nematics in electro-optical display devices.

Chapter 4 on cholesteric liquid crystals gives an account, which is again very clear, of the quite difficult optical

properties of this type of mesophase. It then covers disclinations, flow properties, effects of external fields, and factors influencing the helical pitch and the relevance of these matters to the applications of cholesterics in displays and thermography.

Chapter 5 deals rather briefly with just two of the eight smectic polymorphic types (smectics *A* and *C*), and with transitions involving these phases. The account is most valuable however, expounding as it does various theories of the lamellar order of these phases and their interrelationships with the properties of these smectic states.

The book is attractively presented, and the literary style is pleasing and very readable. Diagrams are numerous and clear, and the index seems adequate. Despite the publication date of 1977 the author's preface is dated August, 1975, and it is not therefore surprising that of over 400 reference citations, the numbers decline from around 80 dated 1973, to less than 50 dated 1974 or 1975, to a handful dated 1976.

The text is surely a valuable addition to the current literature on liquid crystals and should be appreciated by anyone of graduate level and above doing research in the field of liquid crystals or concerned with their technological applications.

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