SHORT COMMUNICATIONS

Contributions intended for publication under this heading should be expressly so marked; they should not exceed about 1000 *words; they should be forwarded in the usual way to the appropriate Co-editor; they will be published as speedily as possible.*

Acta Cryst. (1989). A**45**, 347

On integrating the techniques of direct methods with anomalous dispersion: the one-phase structure seminvariants in the monoclinic and orthorhombic systems. I. Theoretical background. Erratum.

By D. VELMURUGAN and HERBERT H. HAUPTMAN, *Medical Foundation of Buffalo, Inc., 73 High Street, Buffalo, New York* 14203-1196, *USA*

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Abstract

There are two errors in the paper by Velmurugan & Hauptman [*Acta Cryst.* (1989), A45, 158-163]. In equation (3.3), A should read

$$A = 8RR^2_{\mathbf{K}}\bar{R}^2_{\mathbf{K}}[C_2(C_{12}+C_{\bar{1}2}) + S_2(S_{12}+S_{\bar{1}2})],$$

and in Table 1, the third row and second column should read

$$R_1 = |E_{\bar{h}\bar{k}l}|.$$

All relevant information is given in the *Abstract*.

International Union of Crystallography

Acta Cryst. (1989). A**45**, 347

Discontinuation of free offprints

In view of substantial losses suffered by the Union on offprints for articles published in *Acta Crystallographica*, the Executive Committee of the Union in consultation with the Editorial Board has reluctantly decided to discontinue the provision of free offprints to authors for articles published in Section C and not to provide free offprints for articles published in the Fast Communications section of Section A. Authors may still purchase offprints if they wish. The provision of free offprints to authors will continue for articles published in Section B, for articles other than those in the Fast Communications section of Section A, and for articles published in the *Journal of Applied Crystallography*.

The Executive Committee took note of the fact that in Section C nearly all the articles are only two or three pages and without half-tone illustrations, whilst the Fast Communications articles are even shorter, and authors may photocopy their articles instead of ordering offprints. Furthermore, individual readers of *Acta Crystallographica* and the *Journal of Applied Crystallography*, and non-profit libraries acting for them, are permitted to make 'fair use' of the material in the journals, such as to copy an article for use in teaching or research.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (R. O. Gould, Department of Chemistry, University of Edinburgh, West Mains Road, Edinburgh EH9 3JJ, Scotland). As far as practicable books will be reviewed in a country different from that of publication.

Acta Cryst. (1989). A**45**, 347-348

Thermotropic liquid crystals. (Critical reports on applied chemistry, Vol. 22.) Edited by G. W. GRAY. Pp. xii+178. Chichester, England and New York, USA: John Wiley and Sons, 1987. Price £38.

Thermotropic liquid crystals, fundamentals. (Springer series in chemical physics, Vol. 45.) By G. W. VERTOGEN and W. H. DE JEU. Pp. xi+324. Berlin: Springer-Verlag, 1987. Price DM 134.

Both of these books deal with thermotropic liquid crystals, but they address different audiences. The book edited by Gray introduces liquid crystals to those unfamiliar with the diverse terminology and concepts of the field. It is addressed especially to chemists, and it enumerates the great advances that have been made in understanding and utilizing liquid crystals since the advent of liquid-crystal commercial devices two decades ago. The six authors and the editor continually relate the commercial applications of liquid-crystal compounds and mixtures to the basic molecular structures. The book is fascinating reading as it explains the various liquid-crystalline displays in use and under development. The explanations as to how twisted nematics are used in liquid-crystal displays (LCD's) in watches and calculators and how encapsulated cholesterics are used to non-invasively measure temperatures of rooms are both interesting and informative.

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Although the professed aim was to introduce liquid crystals to those new to the field, those who are already working in it will find it to be beneficial. In addition to the descriptions of commercial liquid crystals and brief explanations of how chemists have custom designed new liquid-crystalline materials, the authors have clearly summarized the salient features of the subject in concise tables and descriptions. The first chapter is a convenient summary of the numerous textures and phases in liquid crystals and very nicely categorizes them in a graduated scale from distorted crystals to ordered liquids. The concepts of positional order, bond orientation, and molecular orientation provide useful mental models for thinking of liquid crystals. The second chapter summarizes the current understanding of the relationship between molecular structure and liquid-crystal behavior. Together these first two chapters provide the foundation needed to appreciate the subsequent ones.

The four subsequent chapters discuss advances made in nematics, smectics, cholesterics, and polymers. The focal point of all of these chapters continues to be the commercial applications of liquid crystals. The fundamental models used to explain liquid crystals and the empirical studies that resulted in the current understanding are included to give the reader insight into the advances in the field and how they were made.

The second book on thermotropic liquid crystals by Vertogen and de Jeu does indeed deal with the fundamentals; but unlike the book edited by Gray, it deals with them from a theoretical viewpoint. This book is not designed for those unfamilar with the field of liquid crystals. It begins with a brief description of liquid crystals, the various phases encountered, and experimental methods used to observe these. The descriptions and pictures of the various textures are particularly illustrative.

The second part of this book introduces the continuum theory of liquid-crystalline behavior using a macroscopic theory of elasticity. Since this treatment is based upon tensors of rank two rather than vector fields, this part begins with a brief introduction to tensors for the benefit of the readers. This treatment is then used to calculate the free-energy density, the fluctuations, and even the flow fields found in liquid crystals.

The third section uses a macroscopic viewpoint to explain how techniques such as NMR, polarized Raman scattering, and X-ray and neutron scattering are used to ascertain the ordering and anisotropy in liquid crystals. The physical properties such as refractive index, dielectric permittivity, and electrical conductivity are then explained. These are the basic physical properties that the first book edited by Gray shows are so important to commercial applications.

The fourth and final section of the book by Vertogen and de Jeu gives the phenomenological theory of phase transitions as embodied in the Landau-de Gennes and the molecular-structural description of Maier and Saupe. Theories of both nematic and smectic phase transitions are included. Although these are simplified treatments, the reader will find the treatment thorough enough to merit careful reading.

These two books on thermotropic liquid crystals approach the field from different viewpoints. One is a clear explanation of the field as it has developed commercial applications, while the other is a carefully developed theoretical treatment of the fundamental science that underlies the subject.

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