

The seventh chapter, by J. G. Chystiakova (one of the longest in the book) deals with the optical properties of crystals. The chapter starts with the consideration of plane electromagnetic waves in anisotropic media and then also their behaviour in mono- and biaxial crystals. Such an approach to the subject is a good introduction to the description of the phenomena of binary refraction and light interference in crystals. The other subsections of this chapter concern light absorption and optical activity. The separate problems are the electro-optical, magneto-optical and piezo-optical crystal properties. This subject is richly illustrated by tables of data of the linear electro-optical coefficients and the tensors of elasto-optical coefficients for crystals of different classes of symmetry as well as piezoelectrical and elasto-optical coefficients for some cubic crystals. Also listed are the characteristics of some acousto-optical crystals, e.g. GaP, K, P and LiNbO₃. In the next subsection the author discusses the principle of light dispersion theory, non-linear optical properties and the basis of crystal field theory. She also characterizes laser crystals and the phenomenon of polarized crystal luminescence. For this chapter a rich bibliography dated 1950-1977 has been used.

The last chapter, written by S. A. Pikin, is devoted to liquid crystals. This is a novelty in a handbook on crystallography. Firstly, the author touches on the characteristics of liquid crystals and their optical properties. In the next subsection we find the principles of liquid-crystal theory and information on the magnetic, electrical and thermal properties of liquid crystals. The text of this chapter is excellently illustrated by many colour photographs of typical nematic, cholesteric and smectic structures. The bibliography covers 70 years of publications.

This book will be valuable for all students interested in physics and chemistry. It contains much interesting information for post-graduate students too, who, by that stage, will have touched on crystallography to a greater or lesser degree. I feel this book will also be very helpful to academic teachers for the preparation of lectures. Researchers engaged in the solid-state field will find much valuable information. The authors who composed this book based it mainly on the Russian/Soviet scientific literature together with Anglo-Saxon literature. Any critical remarks in this review do not in any way depreciate the merit of this book, which, in my opinion, is a most valuable publication on crystallography.

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Books Received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

Modern crystallography. Vol. III. Crystal growth. By A. A. CHERNOV, with contributions by E. I. GIVARGIZOV, K. S. BAGDASAROV, V. A. KUZNETSOV, L. N. DEMIANETS and A. N. LOBACHEV. Pp. 20+517. Berlin: Springer-Verlag, 1984. Price DM 154.00, £46.20. This book, just published, is the English language version of Vol. III of the four-volume work on modern crystallography by a large group of Russian authors, whose Editor-in-Chief is Professor Boris Vainshtein. The English volumes tend to follow their Russian language counterparts with a time lag of about two years. In this case the Russian Vol. III came out in 1982 and a review of it has already been published [Auleytner, J. (1983). *Acta Cryst.* A39, 272]. To the original review, the comment may be added that the authors have again taken advantage of the two-year delay due to translation and re-setting by modifying the text and figures here and there, adding extra references, and so on, making the English version rather more than a mere translation but almost a re-editing of the Russian text. As with the previous two volumes, this one, although more specialized (dealing in great detail with crystal growth) is certain to be well received.

The structure of matter: from the blue sky to liquid crystals. By A. GUINIER, translated from the French by W. J. DUFFIN. Pp. x+230. London: Edward Arnold, 1984. Price £9.95. André Guinier, internationally known for his crystallographic achievements and for his warm personality, wrote this book three years ago, in French. (A retired crystallographer, he has explained, can render this sort of service to the public.) Dr Duffin's translation now makes this excellent popular presentation of science available to the world of English-speaking readers. It is truly a most attractive production, full of intriguing and enlightening illustrations, artistic and attention-holding, and, of course, scientifically sound. The original French edition was reviewed by G. S. D. King [*Acta Cryst.* (1982), A38, 559; B38, 1685] who remarked, 'The author's style is so clear that it is a pleasure to recommend this book...'. It is to be hoped that many schools, school pupils and teachers, parents, laymen, ... and even Universities, will make use of it.

Local density approximations in quantum chemistry and solid state physics. Edited by J. P. DAHL and J. AVERY. Pp. xv+851. New York: Plenum, 1984. Price US \$125.00.