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## Book Reviews

*Works intended for notice in this column should be sent direct to the Book-Review Editor (R. F. Bryan, Department of Chemistry, University of Virginia, McCormick Road, Charlottesville, Virginia 22901, USA). As far as practicable, books will be reviewed in a country different from that of publication.*

*J. Appl. Cryst.* (1993). **26**, 145

**Structural and chemical analysis of materials. X-ray, electron, and neutron diffraction; X-ray, electron, and ion spectrometry; electron microscopy.** By *J. P. Eberhart*. Pp. xxx + 545. Chichester (UK): John Wiley & Sons, 1991. Price £95.00. ISBN 0-471-92977-8.

This book gives a comprehensive treatment of the principles governing the use of electromagnetic and particle radiation in materials research. By identifying the concepts that are common to X-ray, electron, neutron and ion radiation, it succeeds in providing a coherent overview of interactions between matter and radiation.

The material is divided into five parts: (i) interactions of X-rays and particle beams with materials; (ii) radiation generation and measurement; (iii) the application of diffraction techniques to materials analysis; (iv) the application of X-ray, electron and secondary-ion spectrometry to materials analysis; (v) techniques of electron microscopy. Helpful cross references between chapters are given.

The first of these parts deals chiefly with the elastic scattering of X-rays, electrons and neutrons, with the devel-

opment proceeding from generalized scattering objects, through discrete and continuous distributions of scattering matter, to diffraction by a crystal. The limitations of the kinetic approximation for electron diffraction are highlighted in a separate chapter, where the essential features of the dynamic theory are introduced. Consideration is also given to secondary emissions and the absorption of radiation. Thus photo-, secondary and Auger electrons are discussed, as are the generation of *Bremsstrahlung* and characteristic X-rays.

The second part gives a readable account of the essentials of radiation generation, focusing and filtering. The treatment of thermal neutrons is cursory, as this is considered to be too specialized a topic. The principles of the design of X-ray detectors (gas ionization and solid-state) are given, together with the essentials of WDX and EDX spectrometers. Brief consideration is also given to the detection of electrons and ions.

The third part of the book is divided into two long chapters, the first dealing with X-ray and neutron diffraction and the second with electron diffraction. The treatment is necessarily selective, with the emphasis on experimental considerations rather than on methods of solving structures. Although there are sections on the indexing of Laue patterns, rotation photographs and X-ray powder diffraction patterns, they provide more of an overview than a didactic treatment. The chapter on electron diffraction gives an adequate treatment of the indexing of single-crystal diffraction patterns and the merging of Laue zones in diffraction patterns. The principles of Kikuchi lines, CBD and LEED are also covered.

The fourth part is helpful in unravelling the acronyms that abound in spectroscopy, e.g. EXELFS, EPMA, with a glossary of these terms at the end of the book. Useful guidance in quantitative analysis is given for each of the techniques. The treatment covers elemental (XRF/EPMA) and surface (ESCA/XPS/AES/SAM) analysis, together with X-ray and electron-absorption techniques such as EXAFS and EELS. Surface analysis by SIMS is covered in a separate chapter.

The final part, dedicated to techniques in electron microscopy, provides an interesting overview. Factors limiting resolution are discussed, as are the principles of bright- and dark-field imaging in TEM. A section on HREM presents the possibilities and limitations

of structural imaging and summarizes the objectives of computerized image modelling. A chapter on SEM highlights the differences in forming images with secondary and back-scattered electrons. This is followed by a brief consideration of STEM, with the final chapter describing the contemporary interest in scanning tunnelling microscopy (STM).

The general standard of presentation is high, although there are a few blemishes and typographical errors. The book has been translated by the author from the original French version, published in 1989. The translation is generally excellent, apart from a very occasional unusual choice of word.

The book focuses on the principles of the physical techniques themselves, rather than on the structure of materials. Thus it will be of value to research workers in materials science, condensed-matter physics and solid-state chemistry. The book provides the essential background information on contemporary techniques and brings out their inter-relationships most effectively. Bibliographies for each chapter, together with a list of primary references at the end of the book, give the reader helpful points of entry into the relevant literature.

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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.*

*J. Appl. Cryst.* (1993). **26**, 145

**Introductory solid state physics.** By *H. P. Myers*. Pp. xi + 546. London: Taylor and Francis, 1990. Price £18.00 (paper back). ISBN 0-85066-761-5. A review of this book, by B. J. Hickey, has been published in the January 1993 issue of *Acta Crystallographica Section A*, page 215.

## International Union of Crystallography

### *Journal of Applied Crystallography* Notes for Authors

#### 1. Submission

The *Journal of Applied Crystallography* is concerned with the application of crystallography and crystallographic techniques, other than crystal structure determination, and with the apparatus, techniques and other factors involved.

##### 1.1. Languages and submission of manuscripts

The languages of publication are English, French, German and Russian.

Every issue of each journal contains the names and addresses of the editors (Editor and Co-editors) and the Technical Editor. Manuscripts may be submitted to any of the editors, but not to the Technical Editor.

Contributions should be submitted **in triplicate** to the editor most convenient for the author. This will normally be the nearest editor but contributions in French, German or Russian should preferably be submitted to an editor in the appropriate country.

The author should retain a copy of the manuscript for checking proofs.

##### 1.2. Machine-readable submissions

Authors who have used  $\text{\TeX}$ ,  $\text{\LaTeX}$ , Wordperfect or Word to prepare their manuscripts are invited to send a machine-readable version with their submission. The following formats may be used: 3.5 and 5.25" IBM-compatible, 3.5" Apple Macintosh and 3.5" Sun OS diskettes; 0.5" 1600/6250 bpi magnetic tape.

##### 1.3. Author's warranty

The submission of a paper is taken as an implicit guarantee that the work is original, that it is the author's own work, that proper credit is given to others, that the manuscript has not been published (in any language), and that it is not being considered and will not be offered elsewhere while under consideration for an IUCr journal. For this reason, the submission must be made over the signature of at least one author.

##### 1.4. Copyright

Except as required otherwise by national laws, an author must sign and submit a copy of the Transfer of Copyright Agreement form (given at the end of these Notes) for each manuscript before it can be accepted.

##### 1.5. Handling

The editor to whom a paper is submitted is responsible for choosing referees and for accepting or rejecting the paper, including deciding its final form for publication and interpreting these Notes, when necessary.

If the paper is accepted, it is the responsibility of the Technical Editor to prepare the paper for printing; he may have to correspond with authors and/or the editor involved in order to resolve ambiguities or to obtain satisfactory figures or tables. The date of acceptance that will appear on the published paper will be the date on which the Technical Editor receives the last item needed.

##### 1.6. Author grievance procedure

An author who believes his paper has been unjustifiably rejected by the Co-editor may appeal initially to the Editor for a new review and, finally, to the Editor of *Acta Crystallographica* if the author is still aggrieved by the decision.

#### 2. Categories of contributions

##### 2.1. Full articles

All papers are sent to referees (ordinarily two) before they are accepted for publication. Full articles should not normally exceed the equivalent of about 10 000 words (1000 words are equivalent to about four pages of double-spaced manuscript).

##### 2.2. Short Communications

*Short Communications* differ from ordinary articles not only in being shorter (they should not normally exceed 1000 words), but also in being printed in smaller type. They are sent to referees in the normal way.

*Short Communications* are not intended for interim reports of work in progress. Although such accounts may be accepted when they concern long-range projects, authors are requested not to submit them when completion of the work may reasonably be expected within eighteen months.

##### 2.3. Fast Communications

*Fast Communications* should not normally exceed the equivalent of about 2000 words (or eight pages of double-spaced typescript). Figures should be clearly lettered. If the paper is available on diskette it would be helpful if this could be sent with the manuscript, together with details of the word-processing package used; it would also be helpful if complicated tables could be submitted as camera-ready copy. *Fast Communications* will be refereed promptly and prepared as camera-ready copy in Chester. In the letter accompanying the submission authors should state why rapid publication is essential. Papers submitted for the *Fast Communications* section but judged by the editor not to merit rapid publication will be considered for inclusion with regular papers.

##### 2.4. Reviews

The Commission on Journals occasionally invites leaders in selected areas to write Lead Articles, which are forward-looking reviews of specific topics. In addition, unsolicited review articles may be submitted for publication in any section of *Acta Crystallographica* or the *Journal of Applied Crystallography* by first submitting a brief outline of the proposed article for approval by the Editor. All selected Lead Articles and review articles will be refereed in the usual manner.

##### 2.5. Computer Programs

A brief description of the purpose, strategy, computer language, machine requirements, input requirements, and the type of results obtained should be included. It is also ordinarily required that the adequacy of the documentation shall have been