

Reference

COCKS, F. H., PREECE, C. M. & KING, H. W. (1966). *Phys. Lett.* **22**, 287–288.

Crystallographers

This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J.N. King, International Union of Crystallography 13 White Friars, Chester CH1 1NZ, England).

The Executive Committee of the International Union of Crystallography elected at the Tenth General Assembly at Amsterdam for the triennium to 1978 is as follows: President – Professor **A. Magnéli**, Vice-President – Professor **B. K. Vainshtein**, General Secretary and Treasurer – Professor **S. E. Rasmussen**, Immediate Past President – Professor **Dorothy Hodgkin**, Ordinary Members Dr **F. R. Ahmed**, Professor **E. F. Bertaut**, Professor **K. Kuchitsu**, Dr **K. Łukaszewicz**, Dr **S. Ramaseshan**, Dr **D. P. Shoemaker**.

Professor **L. H. Jensen** and Professor Dr **D. Mootz** have resigned as Co-editors of *Acta Crystallographica*. Dr **F. R. Ahmed**, Division of Biological Sciences, National Research Council of Canada, Ottawa, Professor Dr **H. Bärnighausen**, Institut für Anorganische Chemie der Universität Karlsruhe, and Professor **E. C. Lingafelter**, Department of Chemistry, University of Washington, have been appointed Coeditors in their places.

Professor **M. M. Woolfson** has resigned as Book Review Editor of *Acta Crystallographica* and *Journal of Applied Crystallography*. Dr **J. H. Robertson**, School of Chemistry, University of Leeds, has been appointed to take his place.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (M. M. Woolfson, Physics Department, University of York, Heslington, York YO1 5DD, England). As far as practicable books will be reviewed in a country different from that of publication.

International tables for X-ray crystallography. Vol. IV. Edited by **J. A. Ibers** and **W. C. Hamilton**. Pp. xi + 366, Figs. 10, Tables 39. Birmingham: Kynoch Press, 1974. Price £10.

Volume IV of *International Tables* contains updated values for much of the

numerical information in Volume III and also extra material concerning certain aspects of crystallography which have been extensively developed since the earlier volumes were published. The choice of the latter topics was partly due to the personal preferences of the editors and although important topics have been omitted, crystallographers will welcome the authoritative treatment of important subjects which is presented in the later sections.

Section 1 contains tables of X-ray wavelengths, one collated according to the atomic number of the elements and a second table collated in increasing wavelength. This section gives a much more extensive tabulation than is found in Volume II.

Section 2 begins with tables of X-ray cross sections and attenuation coefficients. These are followed by tables of X-ray scattering factors. New in this volume are a table of coefficients for an analytical approximation to the scattering factors giving maximum and mean errors, and a table of X-ray scattering factors of unfilled orbitals which may be used for aspherical atoms. The table of dispersion corrections for X-ray scattering factors gives what are apparently more accurate values than in Templeton's tabulation in Volume III, but no indication of accuracy or variation with $\sin \theta$ is given. The electron scattering factor tables are much more extensive than in Volume III, occupying more than one hundred pages.

Section 3 is devoted to diffractometer geometry. A series of excellent sub-sections by the late W. C. Hamilton deals with the mathematical aspects of the calculation of setting angles, the determination of an orientation matrix and measurement procedures.

Section 4 by the same author, gives a table for R -factor ratio significance tests and tables for analysing least-squares weights for consistency. The accompanying discussion is very valuable.

Section 5 contains mathematical articles by C. K. Johnson and H. A. Levy on the thermal motion of independent atoms and rigid bodies. The correction of interatomic distances and angles for thermal motion is also covered. A final sub-section deals with the site symmetry restrictions on the coefficients of thermal-motion tensors.

In Section 6, J. Karle discusses the solution of the phase problem by direct methods. Tables for assisting origin specification along with examples of choices of phases for the different space-group types are included. The following

two sub-sections include discussions on the normalization of structure factors and phase-determining formulae. The final sub-section discusses the symbolic addition method of application of these formulae in X-ray and neutron diffraction. It is a pity that greater recognition is not given to the computer applications of the formulae that have developed in the last ten years. Although Section 6 contains some very useful material, the clarity of presentation of the textual material is not up to the high standard of the previous sections.

In sum, Volume IV is a fine addition to the other volumes. The earlier volumes of the pre-computer era now look rather dated. One hopes that Volume IV sets a standard that will be followed by future volumes in this series.

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Writing scientific papers in English. By **M. O'CONNOR** and **F. P. WOODFORD**. Pp. vii + 108, Figs. 9. Amsterdam: North-Holland, 1975. Price £21.00 (about US \$7.95).

This book could have quite an important influence upon the standard of presentation of scientific work. It gives advice about all aspects of writing papers for publication; although it is aimed particularly at foreigners writing in English, most English-speaking writers could learn a great deal from it as well. The fact that it is primarily directed at biologists does not in the least detract from its usefulness to physical scientists, and, if the authors of papers presented to this Journal were to accept the instructions given, the task of the Editors of this Journal would be made much easier. (For example, it is stressed that typing should be double-spaced – a request in our *Notes for Authors* that is largely ignored.)

The chapters are all very useful and could hardly be bettered. Instructions are given clearly and concisely and in unpretentious language. Grammar is treated only briefly, but the points made are those that the authors consider particularly important; we should, however, have welcomed a longer discussion of the use of hyphens, which we think could make some scientific writing a great deal less mystifying than it often is. Since English makes much use of nouns

as adjectives, it is often not clear, except to the expert, what group of words is acting as an adjective to qualify a noun later on.

The only doubt that we have about the book is that it seems to make the writing of a paper almost impossibly difficult. The number of steps recommended is large; in an appendix 27 such steps are listed leading to the presentation of a manuscript. A new author may well be led to believe that his work cannot really be worth all this effort!

One chapter, however, that is of undoubted use is that on typing. This will be of great help to any typist who is relatively new to the task of preparing a satisfactory scientific manuscript.

Appendix 5 (*Expressions to avoid*) is well worth while studying. It is particularly interesting to see the words 'anticipate' and 'sophisticated' in the 'avoid' column, as these are so often used in the wrong sense.

On the whole, we think that the book should be used as a reference book rather than as a manual. In other words, we think that an author should prepare his work as he thinks best, turning to the book only when he is not sure what to do. Otherwise, he might find that he has spent so much time thinking about the presentation that he has forgotten about the contents!

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Systematic materials analysis.

Vol. 1. Edited by J. H. RICHARDSON & R. V. PETERSON. Pp.xix + 363 Figs. 112, Tables 26. New York: Academic Press, 1974. Price £13.15.

This is a small and expensive book which is the first of a series. This one contains brief descriptions of nine techniques by nine different authors and a general introduction by the editors. The topics covered are: α -particle spectrometry; Auger electron spectrometry; high and low-energy electron diffraction; the electron microprobe; electron paramagnetic resonance spectrometry; fluorometry; infrared spectrometry; liquid chromatography.

Each chapter outlines the principles of the various methods and gives simple

examples of the calculations required to take what is measured and convert it into the quantity required. The emphasis in this volume is largely upon structural determination and the identification and estimation of the elements present in the sample. The range of applications and the sensitivities obtainable are usually illustrated by examples. The references provided by each author will give the reader an introduction to the relevant literature for each chapter.

It is surprising that a series of such books containing a great deal of emphasis upon spectroscopy should not contain a general discussion of how the output of a spectrometer is related to its input. A discussion of instrumental functions and their deconvolution from the output would have produced a unifying basis for all these authors and helped the reader to make a more profound comparison of the techniques under offer. A similar criticism can be made of the disjointed treatment of diffraction in this book – no fundamental theoretical basis is set.

Since all of this material can be found in other books and review articles and since no coherent pattern is imposed upon the various contributions so as to give the book useful form then it cannot be recommended. In addition it is priced at an absurdly high level for the value of its contents.

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X-ray diffraction procedures for polycrystalline and amorphous materials. By H. P. KLUG and L. E. ALEXANDER. 2nd Edition. Pp.xxv + 966, Figs. 375, Tables 97. New York, London: John Wiley, 1974. Price \$34.95, £18.55.

When the first edition of 'Klug and Alexander' was published twenty years ago,* it immediately became recognized as the standard work of reference in X-ray powder crystallography. Despite spectacular advances during the intervening years, particularly in the fields of diffractometry, line-broadening analysis

and the automatic collection and processing of data, the usefulness of the book as a basic text has hardly diminished. Nevertheless, the revised, enlarged and updated second edition should receive the universal acclaim accorded its predecessor. The essentially practical approach has been retained, with the inclusion of sufficient diffraction theory to meet the needs of the majority of diffractionists and ample references to satisfy those requiring a more detailed treatment. The revision has not in any way invalidated the authors' original contention that the book should appeal to those wishing to acquire a knowledge of powder diffraction techniques through their own efforts as well as being of use to workers with a formal training in the subject.

The introductory chapters, covering elementary crystallography, the production and properties of X-rays and fundamental principles of X-ray diffraction, needed little revision, though some new material has been incorporated. The section on standard X-ray sources has been extended and mention is made of high-intensity and microfocus tubes and isotopic sources. The information on commercial generators has been brought up to date and the section on monochromatization now includes details of balanced filters and the use of graphite monochromators. The only substantial alteration to the chapter on diffraction theory is an introduction to thermal (given as 'temperature' in the text) diffuse scattering (TDS) in the discussion of the temperature factor.

There have been relatively few major advances in photographic powder techniques since the publication of the first edition, aside from the field of low-angle scattering. Improvements to the parafocusing camera are detailed in Chap. 4, but more information on the alignment and use of these cameras would have been useful, in view of their increasing popularity in X-ray laboratories; as it is, the reader must refer to the cited literature for practical details. Microcameras and the use of fine-focus beams, and recent developments involving high- and low-temperature and high-pressure cameras also receive a fuller treatment in the revision of this chapter.

Chapter 5, which deals with diffractometric techniques and is one of the most useful in the book, has undergone a major revision. The geometries of diffractometers in common use are described and the authors discuss alignment considerations in some detail. There is, however, no mention of the

* Review: H. S. Peiser. [*Acta Cryst.* (1955). **8**, 366].