

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).

Dr R. W. Hendricks has now returned to the Oak Ridge National Laboratory after having spent the past year at the Institut für Festkörperforschung der Kernforschungsanlage at Jülich, Germany.

Dr J. Schelten of the Institut für Festkörperforschung der Kernforschungsanlage, Jülich is spending a year with Dr R. W. Hendricks, Metals and Ceramics Division, Oak Ridge National Laboratory.

Professor L. B. Shaffer has now returned to Anderson College, Anderson, Indiana after having spent the last year on sabbatical leave at Oak Ridge National Laboratory.

Book Review

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.

Solid-state theory in metallurgy. By PETER WILKES. Pp.xii + 453, Figs. 210, Tables 18. Cambridge Univ. Press. 1973. Price (cloth) £8.95, (paper) £3.20.

This is a book on solid-state physics written by a metallurgist for students in metallurgy and materials science.

The first part contains a simplified introduction to quantum theory to establish a basis for the subsequent discussion of electrons in metals. The free-electron model and properties are also treated here. That part of statistical physics that leads to the distributions of Fermi-Dirac, Bose-Einstein and Maxwell-Boltzmann is included.

The second part of the book is devoted to the crystal lattice and covers crystal binding, lattice symmetries, reciprocal space and crystal defects. There is also a chapter on experimental methods for investigating crystal structure, and finally an exceedingly simplified chapter on Fourier analysis.

In the third and final part the author returns to the electron problem: the effect of the periodic potential is now taken into account. To begin with this is done in an elementary way as a descriptive extension of the free-electron model. This is followed by a discussion of the important nearly-free electron theory containing the recent development of pseudo-potential theory; electron microscopy is also included.

The aim of the book is supposed to be to bridge the gap between solid-state physics and metallurgy. I think that this is an important task but also a difficult one, especially if it must be carried out within the limits of ordinary undergraduate courses. It takes time, for example, for students who do not have a deeper knowledge in mathematics and the foundations of theoretical physics to obtain an understanding of quantum physics. What one can hope for is that the students should gain an insight into the microscopic properties of matter and a feeling for the bases of the macroscopic characteristics. In that respect this book seems rather promising. The very simple treatment of quantum mechanics is just enough to make it possible to read the book, although I think that the third part can be rather arduous. The text covers many important

aspects of solid-state physics in a concise and lucid way. I would, however, object to the presentation of some mathematical details, which I sometimes find too unorthodox. Instead of making the text simpler they can be confusing. Further, the definition of the Dirac δ -function in the chapter on Fourier methods should perhaps have been given in more detail. This certainly offers a good illustration of the great difficulties one has to face in the preparation of a text like this.

I am looking forward to trying out this book in our materials physics courses.

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Book Received

The following book has 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.

The oxide handbook. By G. V. SAMSONOV. Pp. + 524, Figs. 51, 755 references, New York: Plenum Press, 1973. Price \$45.00.

Satisfying the need for a convenient reference on the physicochemical properties of all known oxides, this handbook systematically tabulates data from 700 literature sources. Crystal structure, entropy, thermodynamic potentials of formation reactions, melting and boiling points, molar heat capacity, vapour pressure, thermal stability characteristics, colour, chemical properties, and catalytic capabilities are among the more than 50 properties covered.