

Book Reviews

Transition Metal Chemistry. A Series of Advances. Volume 2. Edited by RICHARD L. CARLIN, Department of Chemistry, Brown University, Providence, R. I. Marcel Dekker, Inc., 95 Madison Ave., New York, N. Y. 1966. ix + 350 pp. 16 × 23 cm. \$14.75.

It is often noted that the population explosion is being challenged by the publication explosion. Chemists have been sufficiently clever to invent the *pill* which may arrest the population explosion. It has become increasingly apparent that a corresponding pill or some device is needed to control our publication explosion.

One of the places where some consideration should be given is that of the ever-increasing number of books being published as annual reviews of various topics. For example, in inorganic chemistry prior to 1959, there were no such reviews. If my rough count is correct, there are now ten books appearing each year on some aspect of inorganic chemistry. In spite of "the renaissance" there is no need for this many annual reviews of the subject. The net result is a considerable amount of duplication of effort which is wasteful and unnecessary.

Having made the above remarks regarding publications in general and annual reviews in particular, I find myself in the awkward position of having to highly recommend this volume. It contains only three chapters, as follows: "Reactions of Ligands Coordinated with Transition Metals," by J. P. Collman; "Transition Metal Ions as Reagents in Metallo-enzymes," by A. E. Dennard and R. J. P. Williams; "Optical Activity in Inorganic and Organic Compounds," by A. D. Liehr. The chapters are fairly long and give a very complete and authoritative account of the topics discussed.

This reviewer has read the first two chapters twice and is certain he will have occasion to refer to parts of them again. There is a wealth of information in these two chapters and anyone interested in homogeneous catalysis in organic reactions and in biological systems must take the time to read these reviews. Collman has done an outstanding job in his account of the role of transition metals in certain organic reactions. Williams makes it abundantly clear that inorganic biochemistry takes its place along side of physical biochemistry and organic biochemistry as a significant branch of biochemistry.

Liehr has written a detailed theoretical account of optical activity in inorganic and organic compounds. Unfortunately, this reviewer is not smart enough to understand the mathematical treatment presented. A preliminary discussion of 13 pages is followed with an appendix of 159 pages. The appendix contains much of the detailed mathematics, several tables, and some most interesting illustrations of structures.

Because of the high density of annual reviews, it is doubtful that even an affluent chemist can buy all of these that interest him. However, this volume should be in the personal library of anyone doing research in any of the three areas covered in the book.

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Single Crystal Diffractometry. By U. W. ARNDT, Medical Research Council, Laboratory of Molecular Biology, Cambridge, and B. T. M. WILLIS, Atomic Energy Research Establishment, Harwell, Cambridge University Press, Cambridge, England. 1966. xv + 331 pp. 14.5 × 22 cm. \$15.00.

The application of X-ray diffraction methods to the problem of determining the structure of crystals is now widely practiced, especially in chemistry laboratories. Until recently this has meant taking a large number of X-ray diffraction photographs, and these have had to be indexed and hundreds, or thousands, of individual measurements of the blackness of the diffraction spots made. It is now possible to avoid this lengthy and tedious procedure by measuring the diffraction intensity with electronic counters, *e.g.*, scintillation counters, gas-filled proportional counters, etc. This means that some complicated electronic equipment (standard apparatus developed in connection with nuclear physics) is required, but above all it is necessary to have some means of orienting the single crystal in the X-ray (or neutron) beam so that each crystal plane is in its correct reflecting position. To do this by hand is extremely tedious and it is with instruments which carry out this process automatically that this book is concerned. Both authors were involved in the development of such instruments and it is not surprising therefore that their approach is a very practical one. They describe the design and use of such instruments and include the application of neutron diffraction as well as the more familiar X-ray diffraction. There are two main types: (a) linear diffractometers which are analog machines in which the reciprocal sphere is surveyed line by line with, usually, some adjustments having to be made after each reciprocal lattice layer is measured; and (b) three- or four-circle diffractometers where the orientation of the crystal plane and the detector are controlled by digital information supplied by punched tapes, punched cards, or by an on-line computer. Both of these are fully described, and practical matters such as the design and arrangements of collimators, the way in which the geometry of diffraction influences the use of the instruments, the design of programs for operating them in several different modes, the selection of the correct angle of scan, the conditions which govern the accuracy of intensity measurements, and many other such matters are considered in considerable detail. Anyone who has tried to use these complicated pieces of equipment will find points to criticize and will wish that some others had been given a fuller treatment. However, they will find that they are constantly turning to the book for information and guidance. This is not a book for beginners in X-ray or neutron diffraction and, although there are chapters on diffraction geometry and on electronic circuits, these are only of use to research workers who are already familiar with the subject. The book is well produced but the quality of the paper is not as high as one could wish in a book which will be more often in the laboratory rather than in a library, and the yellow tinge is not liked by this reviewer.

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