

metallic and ionic crystals. Exact geometrical laws governing the kinematics of slipping and twinning were formulated, the resolved shear-stress law of slip was discovered, and much was learned about the processes of strain hardening, alloy hardening, thermal softening, recrystallization and the formation of textures. The main task that Dr. E. Schmid and Dr. W. Boas set themselves was to tell the story of these discoveries. They did it superbly. For this reason, and also because the story forms a more or less self-contained chapter in the science of plasticity, these parts of their book are as fresh and useful as when they were first written.

Since that time the subject has changed in two ways. First, its technological value has become more widely recognized. Practising metallurgists have realized that the solution of certain problems—for example, the working of hexagonal metals, or the production of transformer sheets with magnetically soft textures—depends upon a detailed knowledge of the crystallographic laws of plastic deformation. It is noteworthy that the translation under review was sponsored by an industrial firm that specializes in magnesium, a metal which is particularly difficult to work because of the manner in which it deforms.

Secondly, academic interest has turned towards the task of building up a theory of plasticity in terms of atomic structure. In 1935 the theory was still convalescing after the shock of the great discrepancy between the theoretical and observed strengths of solids. Admittedly the idea of dislocations had already been thought of; but it was too early for the full impact of this to be felt. The theory of plasticity has now advanced almost beyond recognition, partly because of new knowledge that has come from refined experimental techniques, and particularly because of the new life that the idea of dislocations has brought into the theoretical work.

Because of these developments the last two chapters of the book have become rather dated and their interest is now largely historical. Is it possible to persuade Dr. Schmid and Dr. Boas to prepare a second edition, to tell this second part of the story in the same masterly way as the first one? Perhaps the success with which this very good translation, by Mr. L. H. Tripp, must surely meet, will encourage them to do so.

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## ORGANIC CHLORINE COMPOUNDS

The Preparation, Properties, Chemical Behavior  
and Identification of Organic Chlorine Com-  
pounds

Tables of Data on Selected Compounds of Order III.  
By Prof. Ernest Hamlin Huntress. Pp. xxv+1443.  
(New York: John Wiley and Sons, Inc.; London:  
Chapman and Hall, Ltd., 1948.) £8 5s. 0d. net

SUCH strides have been made, both academically and industrially, since Mulliken's volumes on the identification of pure organic compounds appeared that the task of modernizing them is no light undertaking, both by way of deciding what to include and what to omit. The first volume of this revision appeared in 1941 and covered compounds of order I, that is, compounds of carbon and hydrogen with or without oxygen. With the present volume, which

deals with compounds of order III, that is, compounds of carbon and chlorine with or without hydrogen and/or oxygen, many changes have been introduced; even the publisher's well-known reddish-brown binding has given place to one strongly suggesting the colour of a positive Beilstein halogen test. Compounds are not arranged, as formerly, in chemical families. The classification is simply: solids, in order of melting point; liquids for which boiling points at ordinary pressure are reported, in order of that boiling point; and liquids with boiling points reported only at reduced pressure, in sequence of their empirical formulae. The second group is subdivided into sections according to whether the density at 20° C. is greater or less than 1.15.

The author has not attempted on this occasion to select the best values for physical properties, but has given the full range culled from the literature; where some appeared to be doubtful, this opinion has been indicated. The most important change, however, is in the treatment of the individual entries; the aspect of identification, which was the main purpose of the earlier volume, is fully retained, but the scope has been widely increased to include also methods of preparation (in outline), general chemical behaviour and uses. In consequence, the number of references to the literature has been greatly increased, for example, to more than six hundred for chloroacetic acid; and patent references are also included in moderation and with reserve. The information given is based on a careful search of the literature up to 1945, supplemented to some extent by a selection from 1946 and 1947; but there is no claim that every iota of information has been detailed. One rather novel feature is the inclusion of negative information, that is, where a particular reaction or derivative has not been reported, though the word "unreported" really implies not traceable from index sources.

In all, 1,320 compounds of order III are given individual treatment, of which more than one-quarter are so relatively new as not to be mentioned in the fourth edition of Beilstein; for the others, Beilstein references are included. Of course, with the derivatives described for identification purposes and others mentioned in connexion with chemical behaviour, the compounds described are very much greater in number and, of necessity, branch out in other 'orders'. The space allocated to an individual varies greatly, ranging from a few lines to several pages. This 'order' includes many chemicals of commercial importance, for example, solvents, insecticides, plant-growth regulators, medicinal compounds and intermediates for a variety of purposes; these obviously demand more detailed treatment than compounds which are included because they are relatively simple members of their respective families.

A special feature is made of indexing. Apart from the conventional alphabetical name-index, which includes many of the possible alternative titles, there are indexes based on empirical formulae, on percentage chlorine content, on molecular weight and on chemical type; the last forms a link with the system adopted for Volume 1. It would have been a remarkable achievement had no errors slipped through in a work of this size and of such detail, but the few which have been detected are not worthy of mention here. The combination of the identification aspect with that of chemical behaviour and uses makes this book a contribution of great worth to chemical literature, a value which will be enhanced when the companion volumes appear.