

The final section, the Table des Cycles, is a general index by rings to all the *Cahier* series, principally volumes V through IX. It includes carbocyclic as well as heterocyclic compounds. For each ring, the code number of the reaction involved in its formation, the page of the Texte where it is discussed, and the page of the Tableaux where it is to be found, are given. This section would properly constitute the starting point of a search. Except for the Texte, only a minimal knowledge of French would be required for efficient use.

It is to be hoped that this volume will be followed by one on the larger field of polymolecular heterocyclization. Such a book, together with the present one, would constitute a substantial forward step toward the systematization of information on all heterocyclic chemistry.

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Les Triterpenes Tetracycliques. By GUY OURISSON, Professeur a la Faculte des Sciences de Strasbourg, and PIERRE CRABBE, Professeur a l'Institut Menrice-Chimie de Bruxelles. Hermann et Cie., 115, Boulevard Saint-Germain, Paris VI, France. 1961. 194 pp. 17.5 × 24 cm. Price, 30 NF.

This survey of the chemistry of "Tetracyclic Triterpenes" is the first rather complete review on the subject to include the important advances which have been made since 1955.

After an introduction to the general subject, the book gives a description of the methods used for the elucidation of structures. This description is based on the chemistry of various functional groups as they are affected by the environment found in each ring and is probably more valuable than a description of the elucidation of the structures and of the chemical properties of individual tetracyclic triterpenes taken one at a time. Synthetic work in the field is briefly mentioned as well as various biochemical aspects (biogenesis and biological properties) of the tetracyclic triterpenes.

A major contribution of this monograph consists in the tables at the end of the book which report formulas, physical properties and pertinent references for every known triterpene at the time of publication. In a further table, the data on infrared, ultraviolet and rotatory dispersion for each type of function are summarized. These tables alone should make this volume useful in any laboratory interested in the study of natural products.

Although the foreword was written on May 2, 1961, it is obvious, as shown by the list of addenda at the end of the book as well as on the basis of various omissions, that the printing of the book took a rather long time (there is, for instance, no full description of the chemistry of limonin, nomilin and obacunone, no mention of the interesting n.m.r. study of the cucurbitacins made by Noller, *et al.*, etc.). One can also regret a number of printing errors (see pp. 12, 33, 35, 79, 99, 110) and some confusion in the author index (R. N. Jones has been confused with E. R. H. Jones, for instance). Along the same lines the work of Djerassi on the bromination of 4,4-dimethyl 3-ketones (p. 28), is not mentioned while on page 166 the formula gives the wrong absolute configuration for mevalonolactone.

In spite of these criticisms, the book is a very interesting effort at bringing some order into a very difficult field and should be valuable to chemists interested in the natural products.

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Crystallization. Theory and Practice. By ANDREW VAN HOOK, Professor of Chemistry, College of the Holy Cross, Worcester, Massachusetts. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1961. ix + 325 pp. 16 × 23 cm. Price, \$12.50.

The aim of the American Chemical Society Monographs, of which this book is No. 152, is to make available thorough treatments of selected areas of research for the use of

workers in more or less unrelated fields to assist them in correlating their own work with a larger field of science; also, to stimulate research in the specific field being discussed. To achieve this aim an extensive bibliography is required as a basis for the monograph.

It is fair to say at once that the author has succeeded in realizing the objectives most satisfactorily. The presentation of the material has been organized well. There are but six chapters, each with its own references, plus an appendix in which are listed general references to books, reviews and symposia. The first chapter is intended as a historical review of observations and largely qualitative concepts which have been especially important in the development of the field; Ostwald's influence figures prominently, but recent work is mentioned also and the effect is to provide some orientation in a field whose many different aspects make it very complex. The second chapter, on the basic principles expected to be useful in subsequent discussions, mentions the phase rule, crystallographic principles and X-ray crystallography in such a condensed manner (about four pages each) as to be of limited utility, but then goes on to discuss qualitatively the concepts which have been applied to the growth of external form and habit modification and to outline the development of the Kelvin equation. The chapter concludes with a section on entropy and tables are provided to show the entropy change of various transitions of many different substances; in effect, this chapter is also a survey but of a narrower part of the field.

The third chapter presents, in considerable detail, theories which deal with nucleation-growth phenomena; this is done in two major sections and in each, selected experimental results are given. The first section includes the theories developed for three-dimensional nucleation in liquid-vapor systems and those applying to condensed systems (melts, solutions and solids); two-dimensional nuclei and Frank's screw dislocation theory are also discussed here. The second section of the chapter gives some details of the diffusion and of the adsorption theories of growth.

The fourth chapter contains little theory and serves chiefly to describe methods which have been used to observe the onset of nucleation and the rate of crystallization and to tabulate representative data on nucleation and growth; the collection of references is intended to be sufficiently complete to expedite literature searches for information on specific substances.

The fifth and sixth chapters are devoted to the practical matters of the laboratory preparation of crystals and plant crystallization problems. Crystallization as a unit operation is described rather fully to the point of listing manufacturers of various types of crystallizers and of indicating how a selection might be made. In these two chapters, the author's experience in the sugar industry is the basis for much of the information but, in addition, there is some discussion of heavy chemicals and fertilizers, of single crystals of synthetic gems and of glass and ceramics, the last provided by the Corning Glass Works.

Inevitably, a comparison will be made between this book and the admirable work on crystal growth by H. E. Buckley which appeared in 1951, but actually they are not comparable in detail. Professor Van Hook had first planned a review of the entire subject, but Buckley's book and one by G. Matz in 1954 led him to emphasize more recent theories and crystallization processes. To the extent that there is an overlap in subject matter, the aim has been to make the present book complementary to the others by giving details of matters which appeared in a more condensed form previously and to be brief where former reviews had been fully developed. In addition, the references have been carried through 1959 certainly and apparently through a part of 1960; about 1400 references are given and a casual examination indicates relatively little duplication among chapters. One of the most useful features of the treatment may be the extensive bibliography.

Some regrettable features of the book must be reported. The figures are usually adequate but are rarely excellent and some are crude; there is little uniformity among them. The photographs are good but curiously chosen; for example, it is puzzling that solar salt evaporation should be shown or that bucolic scenes of an old batch sugar process on the island of Mauritius should be included. The number of mistakes in the text is deplorable; without making a line by line search, something like thirty errors were noted in two chapters, including a mis-spelling of Ostwald's name in