

istry, *e. g.*, stereochemistry, olation, and the problems of synthesis, as well as from the findings of recent research, *e. g.*, the mechanism of replacement reactions and the role of coordination compounds in catalysis, and determination of structure through studies of absorption in the infrared. It is unfortunate that the author has not used consistently the system of nomenclature recommended by the International Union of Pure and Applied Chemistry.

Although the reviewer has found a few minor errors in this book, he recommends it as portraying clearly and succinctly the current thinking on coordination chemistry.

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JOHN C. BAILAR, JR.

system, and the special relations involving the allotropic forms of iron in ternary alloys; but these are treated only for the sake of the general schematic relations illustrated. The book, first published in 1932, is therefore in no sense out of date. "Masing" has been the model for subsequent expositions of ternary diagrams, and the book is still unsurpassed for the thoroughness of its treatment of the fundamentals. It is thus still of great value, if not even a requisite, for the serious study of phase diagrams.

The reprinting is in every way as good as the original printing of the English translation (1944).

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JOHN E. RICCI

**Name Index of Organic Reactions.** By J. E. GOWAN, Ph.D., Lecturer in Organic Chemistry, University College, Dublin, and T. S. WHEELER, D.Sc., M.R.I.A., Professor of Chemistry, University College, Dublin. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1960. vii + 293 pp. 14.5 × 22 cm. Price, \$8.50.

Certain reactions, as well as rules and laws of nature, have for many years been named after their discoverers; the numbers were small, and names and reactions readily remembered. Some time was saved in this way, and the fact that a chemist is remembered with his contributions adds appeal to the usage. During the last two decades, it has, therefore, become quite general to refer to reactions by the names of their discoverers, but with the multitude of reactions and authors, a serious problem of memorizing has arisen. Wheeler and Gowan's "Name Index of Organic Reactions," published in 1950 as a pamphlet of 46 pages, was one of the earliest attempts to cope with this situation. The little booklet saved much time, incomplete though it was in regard to entries and to the lack of formulas. The new edition remedies both deficiencies. In a space more than 6 times that of the first edition, it presents an apparently complete list of name reactions and gains further in value by ample references to the literature, by a Type of Reaction Index and by a General Index.

The book not only makes easily available information on reactions which are referred to by their names and serves as a guide to the respective literature, but it may also be useful to some degree as a checklist for possible reactions. Anybody who shares with the reviewer a liking to leaf through encyclopedias may find it a "readable" book and a means of indulging this passion for superficial information. It should be a very useful book for every organic chemist.

RESEARCH LABORATORIES  
EASTMAN KODAK COMPANY  
ROCHESTER 4, NEW YORK

A. WEISSBERGER

**Ternary Systems. Introduction to the Theory of Three Component Systems.** By G. MASING. Translated by B. A. ROGERS. Dover Publications, 180 Varick Street, New York 14, N.Y. 1960. iv + 173 pp. 14 × 21 cm. Price, \$1.45.

This is a welcome reprinting of an excellent translation of a classic work. Masing's exposition of binary phase diagrams accomplishes its teaching purpose with remarkable brevity and consummate clarity. The book deals with the "theory" of three component systems in the sense of the principles of phase diagrams, in particular the spatial relations in the temperature-composition prism representing the liquid-solid equilibria of condensed ternary systems. These spatial relations, which are sometimes quite complicated, are minutely and patiently dissected, through pictures of "state spaces," projections and series of sections. The numerous diagrams are clear, ingeniously inter-related for consistency, and helpfully repeated when necessary to match the text.

The book deals essentially with the schematic relations for the fundamental elements of condensed ternary systems, involving solid solutions, compounds and two-liquid equilibria. The language is that of the metallurgist, "the sample" always being called "the alloy," but the presentation otherwise applies to all materials. Only three specific examples are considered, the aluminum corner of the iron-silicon-aluminum system, the copper corner of the tin-zinc-copper

**$\alpha$ -Aminoalkylierung. Darstellung und Eigenschaften der Kondensationsprodukte H-Acider Stoffe mit Carbonylverbindungen und Aminen.** By HEINRICH HELLMANN and GÜNTER OPITZ. Verlag Chemie, G.m.b.H., Pappelelle 3, Weinheim/Bergstr., Germany. 1960. xi + 336 pp. 17.5 × 24 cm. Price, DM 36, —

The major part of this book (about three fourths) deals with reactions of the type  $AH + RR'C=O + HNR''R''' \rightarrow ACRR'NR''R''' + H_2O$  ("aminoalkylations") among which the Mannich reaction [*Org. Reactions*, 1, 303 (1942)] is the most prominent example. The remaining quarter of the volume deals mainly with reactions of the type  $ACRR'NR''R''' + BH \rightarrow BCRR'NR''R''' + AH$  ("transaminoalkylations") and  $ACRR'NR''R''' + BH \rightarrow ACRR'B + HNR''R'''$  [alkylations with Mannich bases and related compounds, *cf. Org. Reactions*, 7, 99 (1953)]. The senior author, H. Hellmann, is probably the world's foremost expert in the area of these reactions.

A monograph of this type necessarily slices across the body total of our knowledge of organic chemistry. It must be judged, in part, on the basis of whether the cross-section so exposed contains a maximum of correlated facts and excludes as little related information as possible. Based on this criterion the present volume scores highly—more so than the closely related book "Die Mannich Reaktion" by B. Reichert [reviewed by R. Stern in *J. Am. Chem. Soc.*, 83, 1519 (1961)]. Such seemingly diverse reactions as the Leuckart-Wallach reaction ("amino-alkylation of hydrogen," p. 83), syntheses of alkaloids under physiological conditions according to Robinson and Schöpf (p. 210) and the Pictet-Spengler tetrahydroisoquinoline synthesis (p. 216) are all dealt with or at least referred to in the book. However, the score is not perfect. For example, the synthesis of 1-benzylmercaptomethyl-2-naphthol by alkylation of benzyl mercaptan with 1-dimethylamino-2-naphthol described by Poppelsdorf and Holt, *J. Chem. Soc.*, 1124 (1954), is referred to in the section on condensation reactions of Mannich bases (p. 284), but the synthesis of the same compound developed in the same paper by direct condensation of 2-naphthol, formaldehyde and benzyl mercaptan (the equivalent of a Mannich reaction but using a mercaptan instead of an amine) is nowhere mentioned. Neither is it indicated that the reaction of 1-dimethylaminomethyl-2-naphthol with excess benzyl mercaptan gives 1-methyl-2-naphthol in 92% yield. Still in the same thought, this reviewer regrets that alkylations of simple amines and ammonium salts are not included in the section on alkylation with Mannich bases. Thus the reaction of 1-methylgramine with methyl cyanoacetate is discussed in some detail (p. 294), but the entirely analogous reaction of benzyldimethylamine with methyl cyanoacetate [Snyder, Eliel and Carnahan, *J. Am. Chem. Soc.*, 72, 2958 (1950)] is not covered.

Despite the senior author's major contributions to the mechanism of the Mannich reaction and to the mechanism of the alkylation with Mannich bases, the present monograph is largely descriptive; much of the information is summarized in tables. By the way of a caveat: the tables do not always appear to be complete; thus the reaction of gramine methiodide with various Grignard reagents [Snyder, Eliel and Carnahan, *J. Am. Chem. Soc.*, 73, 970 (1951)] is omitted from Table 13 (p. 279) although the analogous reaction of 1-methylgramine methiodide described in the same paper is included in Table 14 (p. 283). There is enough mechanistic and correlative thinking in the book to keep it from making dull reading, but the presentation of mechanistic reasoning is not as penetrating as in the authors'

original papers in the field. On p. 140 an outmoded mechanism is presented for the Sommelet reaction [cf. S. Angyal, *Org. Reactions*, 8, 199 (1954)]. The mechanism proposed for the reaction between furfural and N,N-dimethylformamide on p. 183 appears most unlikely, a reaction course similar to the one shown on p. 84 for other Leuckart-Wallach reactions being much more plausible.

The book is attractively bound and well printed; the type and formulas are large enough to be easily legible. There are 1876 references collected at the end of the book in alphabetical order; unfortunately, this collection does not double as an author index, since it is not possible to tell where the reference occurs in the text. A related but much more serious drawback is the absence of a subject index. Because of this it is quite difficult to locate specific information in the book (the arrangement of the subject matter being of necessity somewhat complex) and this reviewer seriously suggests that a subject index be added in subsequent printings.

This book is a well-written, timely and valuable contribution containing a wealth of useful information. The moderate price (*ca.* \$9.00 or less than 3¢ per page) will keep it from being confined to the shelves of libraries. Because of the wide scope of the reactions discussed, the book should be bought by anyone primarily interested in synthetic organic chemistry and especially by those concerned with the synthesis of compounds of potential pharmacological interest.

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