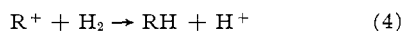


While our reaction is significant in indicating a possible simple hydride ion path for hydrogenation, it is obviously limited to molecules stable under rather drastic basic conditions. We have observed a partial reduction of nitrobenzene to aniline at 160°, but acetone appears to give only aldol condensation products with little if any hydrogen uptake. We are currently exploring additional systems.

In the base catalyzed reaction we believe it is the hydrogen which is activated by conversion to hydride ion. An acid catalyzed process involving activation of the organic molecule by conversion to a carbonium ion is also conceivable.



Reaction (4) is energetically unfavorable in the gas phase by 80–100 kcal./mole but could perhaps proceed to the right in highly polar solvents by virtue of the very high solvation energy of the proton produced. Indeed, a number of examples of the modifying effect of hydrogen on  $AlCl_3$  catalyzed carbonium ion reactions suggest that this may be the case.<sup>4</sup>

(4) Cf. for example the modifying action of hydrogen on  $AlCl_3$  catalyzed hydrocarbon isomerizations, V. N. Ipatieff and L. Schmerling, *Ind. Eng. Chem.*, **40**, 2354 (1948).

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RECEIVED MAY 20, 1961

## BOOK REVIEWS

**Radioactive Isotopes in Biochemistry.** By ENGELBERT BRODA, Professor of Chemistry, University of Vienna (Austria). D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1960. X + 376 pp. 15.5 × 23 cm. Price, \$11.50.

This book is a remarkably concise survey of principles of methodology in the use of radioactive tracers and their application to selected problems in biochemistry. The author avowedly makes no pretense to completeness in any direction. The admitted deficiencies in detail are compensated for to a large extent by more than 3200 references to the original literature, including many of the latest pertinent papers.

The first third of the text is devoted to eight chapters dealing with radioelements in biochemistry, principles of radiochemistry, radiosynthesis, isotope effects, radiation chemistry, radiation biology, protection against radiation, and measurement of radioactivity. This is followed by two chapters on the application of radioactivity to analysis of living matter and absorption and excretion of elements.

The last half of the book entails six well organized chapters on the principal problems and special topics in intermediary metabolism.

The English translation reveals a sound grasp of and feeling for both the original German and English idiom.

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LEON L. MILLER

**Lectures on Theoretical Rheology.** Third Edition. By MARKUS REINER, Dr. Techn., Professor of Applied Mechanics, Israel Institute of Technology, Member of the Israel Academy of Sciences, Sometime Research Professor, Lafayette College, Easton, Pa. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1960. xvi + 158 pp. 15 × 21.5 cm. Price, \$4.85.

This revision of Professor Reiner's earlier twelve lectures (and still earlier ten lectures) is a concise and most readable introduction to a number of topics in the area of rheology. A variety of interesting historical notes are included and are of special interest in that they represent the pertinent comments, unavailable elsewhere, of one of the founders of this area of science.

The differences between this edition and the previous one are largely in the area of readability. Of the three new chapters which have been added one is confined to background calculus and algebra; the other two are very brief

discussions of normal stresses. If one excludes Professor Reiner's own numerous publications, only five or six papers out of a bibliography of perhaps a hundred were published more recently than 1945. Obviously the book was not intended to reflect the scope or results of current research. Neither is the book an encyclopedic compendium of earlier results. However, the reader who is interested in both mathematical and experimental work will find the book a readable and worthwhile introduction to the subject. Professor Reiner's exposition is very lucid and clear and the book appears to be essentially free of typographical errors except for the frequent but usually obvious omission of the dot over a symbol, used to indicate a derivative. The inclusion of pertinent background material in calculus and in fluid mechanics suggest it will be of especial interest to chemists. This reviewer would guess that any scientist becoming interested in rheology in more than an empirical way will want a personal copy of this book if he does not already own the previous edition.

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A. B. METZNER

**Preparativní Reakce V Organické Chemii. Díl V. Aldolisace a příbuzné reakce.** By INŽ. DR. JAROMÍR PLEŠEK and INŽ. ALENA ZOBÁČOVÁ za redakce inž. dr. Miloše Hudlického. Nakladatelství Československé Akademie Věd, Vodičkova 40, Praha 2, Czechoslovakia. 1960. 976 pp. 18.5 × 24.5 cm. Price, Kčs 89, —.

"Aldolization and Related Reactions" is the fifth volume in a series entitled "Preparative Reactions in Organic Chemistry" published by the chemical section of the Czechoslovak Academy of Sciences. The authors of the present volume have attempted to present a comprehensive review of the theoretical and preparative aspects of the acid- and base-catalyzed addition of active hydrogen compounds to aldehydes and ketones, or their functional derivatives. The selection of material for inclusion in the book has been made on the basis of the similarity of reaction mechanisms. All types of synthetic organic reactions involving the addition of active hydrogen compounds to carbonyl groups are included. The book contains chapters on the addition of acetylenes to carbonyl compounds, synthesis of cyanohydrins, Strecker synthesis of  $\alpha$ -aminoacids, reactions of nitroparaffins with carbonyl compounds, reactions of aldehydes with alkyl derivatives of heterocyclic compounds, reactions of carbonyl compounds with "ylids" and triaryl-

phosphinealkylenes, aldolization and aldol condensation, aldol-type condensations of carbonyl compounds with derivatives of carboxylic acids, aldol-type condensations of carbonyl compounds with active methylene compounds, Mannich reaction and related syntheses, as well as other topics.

According to the authors, the Friedel-Crafts reaction and organometallic syntheses, which in some respects may be considered to be related to aldolization reactions in the broad sense, will be the subjects of subsequent volumes of "Preparative Reactions in Organic Chemistry." The authors of "Aldolization and Related Reactions" estimate the number of papers dealing with some aspects of this type of synthesis at several tens of thousands. They have therefore attempted to give only a cross-section of references and to include those papers which are concerned with investigations primarily aimed at the elucidation and elaboration of reactions of the aldolization type. Nevertheless, the authors believe that their book contains enough references to papers describing merely preparative refinements of aldolization-type reactions to be of value as a fairly comprehensive work for the entire field.

The text abounds with discussions of reaction mechanisms and preparative details. Each chapter contains detailed directions for the laboratory synthesis of representative compounds.

Detailed indexes contain over 2600 literature sources (with cross-references giving page numbers in the book where each source is used), a list of authors, a summary of laboratory recipes and a detailed subject index. A very detailed table of contents also contributes to the ease with which the book may be used as a theoretical and practical reference work.

Although the authors have reviewed the literature through 1957, the broad scope of the book necessitated restriction of the number of references by emphasizing the papers which have appeared during the seven years from 1950 to 1957. Attempts were made to include all important references dating back to earlier years.

The broad scope of "Aldolization and Related Reactions," written with the unifying point of view of mechanistically related reactions and, at the same time, paying a great deal of attention to preparative details, makes the book very valuable as a reference work for any practicing organic research chemist.

It is hoped that a future updated edition of this conceptually original, painstakingly detailed, and clearly written book will be translated into other languages so that it will become available to a wider readership.

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IVAN PASCAL

**Proceedings of the Symposium on the Chemistry of Coordination Compounds held during the Twenty-Eighth Annual Session at University of Agra on February 7 and 8, 1959.** Convenor, DR. ARUN K. DEY, Department of Chemistry, University of Allahabad, Allahabad. National Academy of Sciences, India, Lajpatrai Road, Allahabad 2, India. 1960. Part One. 147 pp. 18 × 24.5 cm. Price, Rs. 15.00; Part Two. 203 pp. 18 × 24 cm. Price, Rs. 25.00; Part Three. 302 pp. 18 × 24 cm. Price, Rs. 35.00.

In recent years international chemical conferences have increased greatly in number and importance. Among the more significant of such gatherings has been the series of five conferences on Coordination Compounds which have been held in Welwyn, Copenhagen, Amsterdam, Rome and London (with the sixth to convene in Detroit in the Summer of 1961). Quite independent of this series, but of equal significance in some ways, was the Symposium on the Chemistry of Coordination Compounds which was held in Agra on February 7 and 8, 1959, under the auspices of the National Academy of Sciences of India. The proceedings of the meeting are recorded in the three volumes which are reviewed here. Although most of the conference participants were from India, the meeting was truly international in scope, with representatives from Austria, Canada, Czechoslovakia, England, Hungary, India, Japan, the Netherlands, Scotland, Sweden, the U.S.A. and the U.S.S.R.

Professor Priyadarajan Ray's excellent presidential address "Recent Advances in the Chemistry of Coordination Compounds" opens Part One, which also contains Section I of the symposium: "General Survey." Part Two contains Section II, "Valence Bond Considerations, Stereochemistry and Structure," and Section III, "Techniques and Methods of Investigation." In Part Three are to be found Section IV, "Reactions, Stability and Thermodynamic Considerations," Section V, "Stabilization of Valence States," Section VI, "Analytical Applications" and Section VII, "Miscellaneous."

It is not clear why the symposium was published in three volumes rather than one, for anyone interested in owning this book will certainly want all of it, and would find it more convenient to use if it had one Table of Contents instead of three. This is particularly true since the arrangement of the papers into the seven sections seems in several cases to be somewhat illogical—a situation which is perhaps excusable in view of the difficulty of the problem of classification.

Altogether, this collection contains one hundred and thirty-two papers, some of which are printed in full, and others only in abstract form. The majority are reviews of various fields of coordination chemistry or of specific groups of workers. Several of the subjects reviewed (especially by the European speakers) have been discussed in other places, and are readily available to American readers. A. K. Dey's lecture "India's Contribution to Coordination Chemistry" and that of Kazuo Yamasaki "Recent Researches on Coordination Compounds in Japan" are of special interest in showing how greatly the chemists of these countries have contributed to the understanding and application of coordination chemistry. Many of the papers from the Asian countries (particularly India) reflect the lack of modern research equipment. In spite of this, most of them record valuable work. While it is difficult to produce worthwhile results without extensive equipment, even one well-selected piece of apparatus—for example, an infrared spectrophotometer, a polarograph or a polarimeter—can make possible a great deal of interesting and significant research.

It cannot be truthfully said that the symposium in Agra recorded many significant or new discoveries. It was important, however, in indicating that progress is being made in Asia in the study of coordination chemistry, and it must have been a great inspiration to those who participated in it, and through them, to the chemists of all of Asia. It is to be hoped that more such conferences will be held, and that they will furnish a meeting ground for chemists from the East and West.

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JOHN C. BAILAR, JR.

**The Chemistry of Natural Products. Volume V. The Carbohydrates.** By S. F. DYKE, The College of Technology, Bristol, England. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1960. 232 pp. 16 × 23.5 cm. Price, \$4.75.

This is an amusing little book. The best that can be said for it is: it is cheap and gives a better treatment of the subject than is found in any contemporary American general organic textbook, elementary or advanced. The author has no real familiarity with the field but struggles manfully with its intricacies and especially with the old problem of the two-dimensional depiction of three-dimensional objects—a problem which was long ago solved by the engineers and the crystallographers but still puzzles most organic chemists. Thus, formula XVI on page 39 is pictorially correct but its Fischer projection (VIII) on the preceding page is not quite so. On page 43 a Haworth perspective formula (XXXII) is stated to have been rotated 180° to give an identity (XXX-III) but the two formulas are not identical. On page 22 the fact that the configurational standard selected for the D-series is *dextrorotatory*-glyceraldehyde is not stated. Contrary to the text, the two isomers mentioned at the top of page 72 are predictable but are rarely found; D-glucose *does* form a bisulfite compound under the proper conditions (page 32); for some reason two-dimensional chromatograms are *not* customarily employed with the sugars (page 128); it is *always* possible to obtain selective reaction at the primary hydroxyl group with triphenylmethyl chloride (page 68). Carbohydrate nomenclature for the English