BOOK REVIEWS

Constantes Sélectionées Pouvoir Rotatoire Naturel. I. Stéroides. Tables de Constantes et Données Numériques Organisme Affilié de l'Union Internationale de Chimie Pure et Appliquée. Volume 6. By J.-P. Mathieu, Professor à la Faculté des Sciences de Paris, and A. Petit, Ingénieur I.C.P. Masson et Cie, Éditeurs, 120 Boulevard Saint-Germain, Paris 6, France. 1956. ix + 507 pp. 22 × 27.5 cm. Price, Volumes brochés 12000 Fr., Volumes reliés 12900 Fr.

The purpose of this book is to collect all of the optical rotation data of steroids and to present them in tabular form. This tremendous job has been accomplished with conspicuous success and the authors are to be congratulated and admired for their patience and perseverance. There is no question that this book will be indispensable to investigators in the steroid field, especially research chemists for whom the calculation of molecular rotation differences has been made much easier.

The arrangement of the data (by empirical formula) and of the references (separated by individual journals for each year and then in alphabetical order of authors) is superb and any desired compound or reference can be found at a glance. The introduction (French as well as English) covers various nomenclature problems and on the whole follows the recommendations of the Ciba Foundation Conference.

The book is supposed to cover the literature up to January 1, 1953 and it does so admirably. However, there are listed an additional 600 references for 1953–1955 and spot checks by this reviewer have shown that many of these references are *not* represented in the body of the book. For instance, specific rotations of compounds listed in references 53.142, 53.144, 53.147, 54.254 are not given in the book, while other references from the same years (*e.g.*, 53.129, 54.94, 54.249 and 54.236) are represented. Furthermore, even though a later reference is listed, it does not necessarily mean that earlier incorrect assignments have been corrected (*e.g.*, 19-nordesoxycorticosterone where the rotation listed in ref. 53.223 is not given but rather that of a stereoisomeric mixture reported in 1944). The book is not free of errors (*e.g.*, three consecutive rotations on p. 253, j, k and l, are reported incorrectly) as in fact no compendium of this type could be, but in view of the excellent literature coverage, the original paper can and often should be consulted. It appears to this reviewer that while the reader can take it almost for granted that all compounds listed in the papers of the bibliography through 1952 are given in the tables, this is not the case from 1953–1955 and cross checking with the original papers will be required.

The need for such a book has been created by the great awareness on the part of steroid chemists of the importance of rotational data and the valuable information that can be deduced from them utilizing the method of molecular rotation differences. It is the feeling of this reviewer that much of this work will be supplanted in the future by optical rotatory dispersion data because of the much greater accuracy and scope of this method, particularly as it pertains to the evaluation of conformational factors. At some future date, a similar compilation of rotatory dispersion data will be indispensable and since the direct reproduction of rotatory dispersion curves would hardly be feasible when one deals with many hundred or thousand of them, a general abbreviated scheme for reporting such data should be agreed upon in the very near future. This would insure uniformity in reporting such material in journal articles and it will greatly facilitate eventual collection of optical rotatory dispersion data in book form.

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Mechanism of Organic Chemical Reactions. By E. de Barry Barnett, D. Sc. (Lond.), F. R. I. C., formerly Head of the Chemistry Department, Sir John Cass Technical Institute. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. vi + 289 pp. 15 × 22 cm. Price, $4.75.

Perhaps only three kinds of people should write books dealing with mechanisms of organic reactions: (1) the highly critical (their texts may serve a decade or more), (2) the highly up-to-date (their texts may serve for as long as five years) and (3) those who have made such major contributions that a whole book is required for their work alone. The present book is rather far from these considerations.

The purpose of the author has been to discuss some of the familiar reactions of organic chemistry by means of "a brief account of modern views of the mechanism by which (they) take place." The combination of a wide range of topics with the shortness of the book might render it attractive to some groups of chemists; and the facts, as far as they are given, are presented in a readable and clear style. The emphasis on reactions rather than on mechanisms *per se* occasionally results in rather speculative discussions of little-understood reactions. But the book suffers in a number of more serious ways. Perhaps the major criticism is that not only is the material badly out of date in many areas of current interest but that classic studies done over twenty years ago have been overlooked. The number of incorrect statements of the type, "The mechanism of formation of oximes, phenylhydrazones, semicarbazones and the like does not seem to have been examined," (p. 156) is substantial. In some of these cases the data have been in the literature only a few years, but in several cases for a much longer time.

But even confining evaluation to what is discussed, the book comes off poorly. There is much imprecision of expression and all-too-many errors in interpretation and definition. In a discussion of the nitration of *p*-isopropyltoluene, the conclusion is drawn that "the nitro-group takes the position *ortho* to the methyl group, almost certainly owing to hyperconjugation of the three methylic hydrogen bonds with the nucleus" (p. 48). It is not until three pages later that the importance of the bulk of a directing substituent in electrophilic substitution is introduced (in connection with the *ortho–para* ratios of nitration of monoalkylbenzenes), but there is no suggestion that these same steric considerations may have been the decisive factor in attack by the nitronium ion *ortho* to the methyl group in *p*-isopropyltoluene. Although the author's discussion of mesomerism (or resonance) is satisfactory (p. 1–3), the statement, "the carbonium ion $^{\oplus}\mathrm{CHPh{-}CH{=}CHMe}$ isomerizes very easily to $\mathrm{CHPh{=}CH{-}}^{\oplus}\mathrm{CHMe}$," (p. 252) gives one pause. And to say that acid-catalyzed esterification is *probably* (italics mine) the reverse of acid-catalyzed hydrolysis (p. 254) is an unduly mild way of stating the principle of microscopic reversibility. Incorrect definitions of words, such as *threo* and *erythro* (p. 122) and of expressions, such as "partial rate factor" (p. 50), and incorrect mechanisms (particularly with radical reactions: free radical halogenation, p. 24, substitution, p. 86, 207, N-bromosuccinimide, p. 275) are a further misfortune.

In the preface the author expressed the hope that "the book will be useful not only to students . . . but also be of interest to the older generation of organic chemists who have got somewhat out of touch with modern academic work." For those desiring a general, qualitative introduction to theories of organic chemical reactions, the author's hope may be realizable, but for the reasons outlined above, the book is not recommended to students.

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Physics of Fully Ionized Gases. Interscience Tracts on Physics and Astronomy, No. 3, edited by R. E. Marshak. By Lyman Spitzer, Jr., Princeton University Observatory, Princeton, New Jersey. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1956. ix + 105 pp. 13 × 20 cm. Price, paper cover, $1.75; hard cover, $3.50.