

Interestingly, **1d** rearranges to *cis*-8,9-dihydroindenes^{2,18} (and therefore probably passes through an activated complex related to conformation **5**)^{1,22} whereas **1a-c** do not. Apparently two alkyl groups at C₉ (rather than only a *syn*-9-alkyl group) are required to eliminate rearrangement *via* conformation **5** as the major process. Additional data are required in order to define the cause of this behavior but we suggest that there is greater steric hindrance which is less easily relieved (a "buttressing effect"²³) in the case of **1a-c**. That is, $\angle C_1C_9CH_3$ (α in structure **1**) may be smaller in the dialkyl derivatives than in **1d** (*cf.* $\angle CCC$ in neopentane (109.5°) and isobutane²⁴ (111.2°) and $\angle C=CC$ in isobutylene²⁵ (122.4°) and propene²⁶ (124.3°)), and

(22) W. Grimme, *Chem. Ber.*, **100**, 113 (1967).

(23) For other examples of buttressing effects see (a) F. H. Westheimer in "Steric Effects in Organic Chemistry," M. S. Newman, Ed., John Wiley & Sons, Inc., New York, N. Y., 1956, Chapter 12; (b) J. P. Mazaleyra and Z. Welvart, *Chem. Commun.*, 485 (1969), and references cited.

(24) D. R. Lide, Jr., *J. Chem. Phys.*, **33**, 1519 (1960).

(25) L. H. Scharpen and V. W. Laurie, *ibid.*, **39**, 1732 (1963).

(26) D. R. Lide, Jr., and D. Christensen, *ibid.*, **35**, 1374 (1961).

in addition, the force constant (k) for increasing α is probably substantially greater in the case of **1a-c** relative to **1d**; k for $\angle C_{sp^2}C_{sp^2}C_{sp^2}$ has been calculated to be 87% greater than that for $\angle C_{sp^2}C_{sp^2}H$ ²⁷ and k for $\angle C_{sp^2}C_{sp^2}C_{sp^2}$ (or $\angle C_{sp^2}C_{sp^2}C_{sp^2}$) has been taken to be 67% greater than that for $\angle C_{sp^2}C_{sp^2}H$ (or $\angle C_{sp^2}C_{sp^2}H$).²⁸

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(27) (a) J. H. Schachtschneider and R. G. Snyder, *Spectrochim. Acta*, **19**, 117 (1963); (b) see J. B. Hendrickson, *J. Amer. Chem. Soc.*, **89**, 7036 (1967), for a lucid discussion.

(28) N. L. Allinger, J. A. Hirsch, M. A. Miller, and I. J. Tyminski, *ibid.*, **90**, 5773 (1968).

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Additions and Corrections

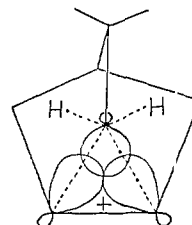
Photolysis of 1,4-Dichlorobutane Sensitized by the n,π^* Singlet State of Acetone [*J. Am. Chem. Soc.*, **91**, 4925 (1969)]. By MORTON A. GOLUB, Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California 94035.

At the end of the caption for Figure 1, Δ should be replaced by \triangle .

Stable Carbonium Ions. LXXXVIII. Hydrogen-1 and Carbon-13 Nuclear Magnetic Resonance and Laser Raman Spectroscopic Study of the 2-Methyl-, 2-Ethyl-, and 2-Phenylbornyl Cation [*J. Am. Chem. Soc.*, **91**, 3958 (1969)]. By GEORGE A. OLAH, JOHN R. DE-

MEMBER, CHRISTINE Y. LIU, and ANTHONY M. WHITE, Department of Chemistry, Case Western Reserve University, Cleveland, Ohio 44106.

On page 3958, the figure was incorrectly reproduced. The corrected figure is shown below.



Book Reviews

The Chemistry of the Nitro and Nitroso Groups. Part I. Edited by HENRY FEUER, Department of Chemistry, Purdue University, Lafayette, Indiana. Interscience Publishers, John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1969. xii + 771 pp. 16 x 23.5 cm. \$29.95.

There has not been a book on this subject before, notwithstanding the great technical as well as academic importance of nitro and nitroso compounds, and it can be judged that the appearance of such a book is overdue by the fact that this one requires two volumes (and even then is not encyclopedic). The subject is too large for proper coverage by one man, of course, and this first volume is written by ten different chemists in nine chapters.

The chapters cover not only classical, descriptive chemistry, but also photochemistry, spectroscopy (two chapters), and "theoretical

aspects of C-NO and C-NO₂ bonds." Some verge on the monumental (that on nitronic acids and esters has 138 pages and lists 490 references). The weakness of so many books consisting of contributed chapters—unevenness of presentation and coverage—is quite apparent, however. The chapter on theoretical aspects does not even mention the dimers of nitroso compounds and their intriguing structure, yet it discusses amine oxides and nitroxides, which are not really relevant to the book.

George Wright's chapter on the nitramino group stands out as particularly well written. It is critical, thorough, and includes both historical perspective and lots of usable information in tables. Arnold Nielsen's chapter on nitronic acids and esters shares honors with Wright's, and the two together make the book really worth having.

Some of the other chapters are good, but some are little more than a mechanical recitation of undigested descriptive material. Unfortunately, those that deal with "methods of formation" are not very critical or comparative; one of these does not even quote yields regularly. The reader interested in synthesis will find such chapters useful principally as lists of references. The editor must share the blame for such shortcomings, and if this review can serve to remind book editors that they have a duty to edit, it will have justified itself.

The title of a book should give a reasonably accurate idea about what is to be found in it. This book might be thought to deal with both inorganic and organic nitro and nitroso compounds, instead of only organic. On the other hand, the cover design includes the symbols "C-NO₂" and "C-NO," yet more than this is intended, as shown by the inclusion of the chapter on nitramines. However, the table of contents of Part 2 (yet to be published) is given on page xii; neither it nor Part 1 includes nitrosamines. The omission is very difficult to comprehend. O-Nitro and O-nitroso compounds (nitrate and nitrite esters) are also omitted.

An author index of 50 pages and a subject index of 37 pages are included. Is an author index really justified in a book of this type? Certainly the subject index will receive enormously greater use. It is a good subject index, with few significant omissions (among them, however, is "Mills reaction").

Taken as a whole, this book is well done, and it will be found useful for many years to come. The viewpoint adopted, "groups" instead of "compounds", should be borne in mind when using the book, or one may be disappointed when seeking information on specific compounds (e.g., the K_a 's for nitroacetic acid) that may not be given. The price is not excessive for a reference book, when considered on a per-page basis (about 4¢ a page), and specialists should be able to justify the expense of a personal copy.

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Isocyanide Complexes of Metals. By L. MALATESTA, Professor of Chemistry, University of Milan, Milan Italy, S.c. Accademia Naz. dei Lincei, and F. BONATI, Associate Professor, University of Milan. Wiley-Interscience, John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1969. vii + 199 pp. 15.5 × 23.5 cm. \$8.50.

This book is intended to bring up to date the chapter on this subject that was written by Professor Malatesta for the first volume of "Progress in Inorganic Chemistry," published by John Wiley and Sons in 1959. The book largely deals with the syntheses and reactions of isocyanide metal complexes. This portion of the book is written in much the same manner as had the original chapter, but expanded to include information reported during the past ten years. Anyone familiar with the original chapter will be disappointed to learn that little of fundamental significance has been accomplished on the descriptive chemistry of these systems in recent years. More compounds have been prepared and more reactions observed, but the basic chemistry elegantly done largely by Professor Malatesta and his school in Milan remains much the same.

The material in the book which does differ from that reviewed previously is the information accumulated on physical measurements reported on these compounds. For example, Mössbauer spectra are now available for some of the iron compounds, and extensive use of the infrared spectra and some use of nuclear magnetic resonance measurements are being made. Single-crystal X-ray structural data are given for a few compounds. These observations are discussed in terms of the contribution of σ and π bonding to the metal-carbon bond strengths in various isocyanide metal complexes.

This book will primarily be used by inorganic chemists, and it was, therefore, very thoughtful of the authors to devote the first chapter to the preparations and properties of alkyl and aryl isocyanides. The second chapter discusses the general properties of isocyanide metal complexes, and the other six chapters deal with such complexes of specific groups of metals. Extensive tables are given of known compounds which include some physical properties and the original literature references to the compounds. Recent publications (through 1968) are discussed and referenced in an appendix.

The book is well written by authors who are very knowledgeable of the field and who have had considerable laboratory experience with these materials. One can certainly expect to find the known experimental facts on isocyanide metal complexes in this book. The book is a must for any good chemistry library and will be a useful reference book for chemists doing research in this general area.

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