considerations with the chemistry reported. It was proposed from bonding principles[6] and molecular orbital energies[7] that the *meta* isomer should be more stable than the *ortho* isomer. Thus the preparation of neocarborane,[4] which was obtained from carborane at approximately 470°, is in accord with this assumption. As opposed to the participation of carborane in five-membered exocyclic rings,[2,3] similar reactions of neocarborane[4] led only to noncyclic derivatives. Also, comparison of neocarborane derivatives with the analogous carborane derivatives has shown that the former are almost invariably lower melting; this would indicate that the former are of a more unsymmetrical conformation than the latter. From additional work in progress in this laboratory, we have not encountered any evidence which would contradict this assignment.

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(6) W. N. Lipscomb, *Proc. Natl. Acad. Sci. U. S.*, **47**, 1791 (1961).

(7) R. Hoffmann and W. N. Lipscomb, *J. Chem. Phys.*, **36**, 2179 (1962).

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The Hydrogen Diiodide Anion[1]

Sir:

Previous attempts to prepare the hydrogen diiodide anion have resulted in black oils[2] or other products.[3,4] An extension of our synthesis of tropenium hydrogen dihalides[5] to the hydrogen diiodide likewise failed since tropenium ion is reduced by hydrogen iodide. We wish now to report the synthesis of tetrabutylammonium hydrogen diiodide, the first salt of this anion to be characterized.

Passage of hydrogen iodide over a stirred solution of tetrabutylammonium iodide in methylene chloride gives a yellow solution; addition of cyclohexane (saturated with hydrogen iodide) precipitates an oil which on repeated treatment with the same reagent crystallizes to yield 99.3% tetrabutylammonium hydrogen diiodide as brilliant yellow microneedles.

Anal. Calcd. for $C_{16}H_{36}NI$: HI, 0.00; I, 34.36. Calcd. for $C_{16}H_{37}NI_2$: HI, 25.72; I, 51.04. Found: HI, 24.99; I, 50.73.

The hydrogen diiodide dissolves in oxygen-free water to give strongly acidic yellow solutions. The crystals lose hydrogen iodide on heating or washing with acetone to yield the iodide. The hydrogen diiodide decomposes rapidly in the presence of light, oxygen, or moisture, but is reasonably stable in their absence; all manipulations were carried out as an oxygen-free drybox under red light.

Since there does not appear to be an opportunity for cation–anion charge transfer in this salt the yellow color of the compound must be ascribed to the anion.

Under similar conditions N-ethyl- and N-butylpyridinium iodides and tetrapropylammonium iodide failed to yield hydrogen diiodides.

(1) Supported by the Petroleum Research Fund and the National Science Foundation.

(2) F. Kaufler and E. Kuntz, *Ber.*, **42**, 2482 (1909).

(3) A. Hantzsch, *ibid.*, **64**, 667 (1931).

(4) G. J. Janz and S. S. Danyluk, *J. Am. Chem. Soc.*, **81**, 3850 (1959).

(5) K. M. Harmon and S. Davis, *ibid.*, **84**, 4359 (1962).

(6) Petroleum Research Fund—American Chemical Society Scholar, 1963.

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Book Review

Advances in Inorganic Chemistry and Radiochemistry. Volume 4. Edited by H. J. EMELÉUS and A. G. SHARPE, University Chemical Laboratory, Cambridge, England. Academic Press, Inc., 111 Fifth Ave., New York, N. Y., 1962. viii + 344 pp. 16 × 23.5 cm. Price, $11.00

This book consists of a set of six review papers, each of which might appropriately have been published in *Chemical Reviews*. Each article deals with a limited topic of considerable recent activity. The widely diverse areas treated emphasize the extent of modern inorganic chemistry. Five of the papers carry comprehensive outlines of contents, and probably the greatest value of the book resides in the extensive list of references for each chapter. The title, authors, and a brief statement of the content of each article are given below.

(1) "Condensed Phosphates and Arsenates" by Erich Thilo, 75 pages, 372 references. This chapter, dealing primarily with phosphates, describes the properties of many phases prepared in high temperature systems and discusses some structural bases for these various phases. (2) "Olefin, Acetylene, and π-Allylic Complexes of Transition Metals" by R. G. Guy and B. L. Shaw, 55 pages, 223 references. This is a catalog of the multitude of compounds prepared in recent years with transition metal atoms bonded to unsaturated hydrocarbon groups. The results of infrared spectroscopy, n.m.r., and X-ray diffraction are cited in discussing the nature of individual compounds. Complexes formed from cyclopentadiene and its derivatives, carbon monoxide, or aromatic compounds are not treated comprehensively in this review. (3) "Recent Advances in the Stereochemistry of Nickel, Palladium and Platinum" by J. R. Miller, 63 pages, 270 references. The stereochemistry of these elements, primarily in the 0, +1, and +2 oxidation states, is discussed with the consideration of recent X-ray diffraction results, spectroscopic studies, and recent developments in ligand field theory. (4) "The Chemistry of Polonium" by K. W. Bagnall, 33 pages, 137 references. This paper is the book's only real condescension to the "Radiochemistry" in its title since all nuclides of this element are radioactive and macroscopic studies invariably involve massive radiation effects. It does not deal primarily