Additions and Corrections

Hydrolysis of Xenon Hexafluoride and the Aqueous Solution Chemistry of Xenon [*J. Am. Chem. Soc.*, **86**, 2141 (1964)]. By E. H. Appelman and J. G. Malm, Department of Chemistry, Argonne National Laboratory, Argonne, Illinois.

An electrode potential of 3.0 v (IUPAC convention) was erroneously calculated for the half-reaction

$$XeO_3 + 3H_2O = H_4XeO_6 + 2H^+ + 2e^- \qquad (1)$$

The data used in the calculation are

$$HXeO_4^- + 4OH^- = HXeO_6^{-3} + 2H_2O + 2e^- \quad E_B^\circ \simeq 0.9\ v$$

$$XeO_3 + H_2O = HXeO_4^- + H^+ \quad pK = 10.5$$

$$H_2XeO_6^{-2} = HXeO_6^{-3} + H^+ \quad pK = 10.5$$

$$H_3XeO_6^- = H_2XeO_6^{-2} + H^+ \quad pK \approx 6$$

$$H_4XeO_6 = H_3XeO_6^- + H^+ \quad pK \approx 2$$

Correct calculation yields for eq 1 a potential of 2.3 v. Despite this correction, perxenic acid remains an extraordinarily potent oxidizing agent. We have observed, for example, that it instantly oxidizes Ag^+ to Ag^{+2} in 1 *M* perchloric acid.

Book Reviews

Organic Insertion Reactions of Group IV Elements. By Edmund Yanovich Lukevits and Mikhail Grigor'evich Voronkov, Heteroorganic Compounds Laboratory, Institute of Organic Synthesis, Academy of Sciences of the Latvian SSR, Riga. Plenum Publishing Corp., 227 West 17th St., New York, N. Y. 1966. xii + 413 pp. 17 × 23 cm. $25.00.

It is now more than 20 years since it was discovered by several people in this country that hydrides of silicon would add to alkenes and alkynes, under suitable catalytic encouragement, to form authentic organosilicon compounds. Most chemists would say that the silicon hydride added across the multiple bond, hydrogen becoming attached to one carbon atom of the bond and silicon becoming attached to the other. This would simply add the new reaction to a host of other addition reactions for such multiple bonds. From the standpoint of those interested in inorganic hydrides, however, the new reaction was an insertion reaction; two carbon atoms joined by a multiple bond (which could be part of a much larger organic structure) were inserted between the silicon and hydrogen atoms of a silane. A similar reaction was soon found to take place with germanium and tin hydrides, and many aspects of its generality were taken up.

Since there are a great many alkenes and alkynes available as starting materials, and since the number of organosilicon intermediates available by other methods was decidedly limited, it was natural that a great deal of exploratory research should go into the new addition or insertion reactions. Much of this work went on in Russia, as part of a very large effort in the field of organosilicon chemistry and silicone polymers. Two people who have been active in this research, Professor M. G. Voronkov (formerly of Leningrad State University and then head of a research group at the Institute of Silicate Chemistry of the Academy of Sciences at Leningrad and the Heteroorganic Compounds Laboratory of the Academy of Sciences at Riga) and Dr. E. Y. Lukevits (also at Riga), have now written a book summarizing all of the work done in Russia and other countries up to the middle of 1963. A welcome English translation has now been prepared by Michael J. Newlands of Manchester Institute of Technology, who has done skillful translations of other Russian books in related fields. The formidable original title of "Hydrosilylation, Hydrogermylation, and Hydrostannylation" has been changed to "Organic Insertion Reactions of Group IV Elements."

The book consists of an introductory chapter which summarizes briefly the effect of structure of the hydrosilane and of the unsaturated organic compound on the rate and course of the reaction, another brief chapter on mechanism of the reaction, a chapter of 21 pages on the hydrosilylation of the C=C bond, a chapter of only 6 pages on the hydrosilylation of the C≡C bond, and another very brief chapter on the hydrosilylation of carbonyl and nitrile bonds, then a part devoted to the corresponding reactions of hydrides of germanium, tin, and lead, a part devoted to examples of preparative syntheses, and finally an ambitious tabulation of all of the hydrosilylation, hydrogermylation, and hydrostannylation reactions which have been recorded in the literature. This table is well organized, and one can soon find out whether any given hydrocarbon or its derivative has been tried in the insertion reactions. In each case the empirical formula and the structural formula of the organic reactant are given, the formula of the hydrosilane, the reaction temperature and pressure and time, the reaction products (if they were identified), the yield, and finally the references to the original papers. In those many instances where catalysts were used, the catalyst is indicated in a separate column. With its literature references, this enormous table occupies 214 pages, covering 2616 entries. Further to increase its utility as a reference work, the authors have added a formula index and a complete bibliography.

It is hard to find anything to criticize in so useful a piece of work as this. Anyone who is working intensively in the field of preparative chemistry involving silicon will be grateful for the compilation and will not quibble about the price. The printing is clear, the paper is substantial, and the binding is sturdy, as befits a book with so practical a purpose. In your reviewer's opinion, the authors and the publisher have done the busy chemist a good service.

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