

The hydrogen iodide and sulfur hexafluoride were metered separately into 1-l. glass vessels so that the respective partial pressures were in the ratio 8:1 and the total pressure was about 1 atm. at 20°. The charged vessels were then maintained thermostatically at 25 and 35° for 72 hr. in the dark. At the end of this period no pressure change was detected. A small volume of water was then injected into the gas mixtures to dissolve the HI. The residual gas was found to consist entirely of SF₆. Analysis of the aqueous extracts by means of the standard techniques¹² confirmed

(12) A. I. Vogel, "A Text-Book of Quantitative Inorganic Analysis," 3rd Ed., Longmans, Green and Co., London, 1961.

the absence of free iodine, hydrogen sulfide, and fluoride ion. When the experiments were repeated with the reaction vessels exposed to radiation from a mercury vapor lamp it was found that iodine was formed to the extent of about 5% of the hydrogen iodide originally taken. There was again no evidence of SF₆ decomposition.¹³

(13) NOTE ADDED IN PROOF.—Mr. W. G. LAWN, University of Pennsylvania, has confirmed our observations in a recent investigation of the reaction in question.

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Book Review

Friedel-Crafts and Related Reactions. Volume II, Parts I and II and Volume III, Parts I and II. Edited by GEORGE A. OLAH. John Wiley and Sons, Inc., New York, N. Y. 1964. 16.5 × 24 cm. Volume II: Part I, 658 pp.; Part II, 703 pp. \$50.00. Volume III: Part I, 910 pp.; Part II, 695 pp. \$60.00.

The key words in the title of these rewarding volumes are "Related Reactions," for "Friedel-Crafts Reactions" is liable to call to mind a too-restricted domain of organic and inorganic chemistry. Investigators with an interest in nearly any branch of chemistry will find rich fare in at least one chapter in these four volumes. As is to be expected, a majority of the chapters deal with "classical" Friedel-Crafts reactions, alkylations of aromatics with alkanes, alkenes, dienes, and alkynes, with ethers and carbonyl compounds, and acylations with acid derivatives. Volume III, Part I, for instance, consists mainly of two long chapters, one (381 pages, including 216 pages of tables and 2160 references) describing the synthesis of aromatic ketones and the other (375 pages, including 235 pages of tables and 1701 references) dealing with acylations with di- and polycarboxylic acid derivatives. Shorter chapters on the Houben-Hoesch synthesis and the Fries reaction are also included. These chapters are much like those which appear in "Organic Reactions," and they provide critical keys to the literature and discussions of mechanisms and catalytic and solvent effects. Volume III, Part II consists of shorter articles covering more varied grounds. A chapter on cycliacylation is followed by a short but illuminating one on the mechanism of acylations. The chapter on aliphatic acylations is an excellent example of the wide scope of these articles. The reactions of alkenes, alkanes, and alkynes with acid chlorides are considered, and, in addition to straightforward reactions, a host of fascinating rearrangements and unexpected transformations are described. Aromatic halogenation, sulfonation, nitration, and sulfonylation as well as the synthesis of aromatic acids and aldehydes are reviewed in other chapters.

Volume II follows somewhat the same pattern. Part I covers the alkylation of aromatics with alkenes, alkynes, and alkanes, with haloalkanes, alcohols, and ethers, with aldehydes and ketones, and with esters of inorganic acids. In Part II generally less-familiar reactions are considered including cyclialkylation

and dehydrogenation condensation reactions. Chapters dealing with isomerization of aliphatic and aromatic hydrocarbons and alkylation of saturated hydrocarbons again take us far afield from aromatic chemistry and provide a great deal of information which it is difficult to obtain elsewhere. A chapter on polymerization, one on hydrogen exchange, and others on the Prins reaction, the condensation of haloalkanes with alkenes, and haloalkylation complete this part.

With such a large number of authors, the quality of the chapters varies, but the average is high and the authors have obviously devoted a great deal of effort to their contributions. Since all the reactions considered have many elements of similarity, there is inevitably a rather high degree of redundancy in some of the sections—notably those dealing with mechanism and catalytic effects. Few readers (including even a reasonably conscientious reviewer) will read all of these volumes at one stretch. As a consequence, this redundancy is welcome, as chapters can be dipped into nearly at random.

These volumes will be available in any good chemistry library. They are expensive, and purchase for a personal collection will vary according to need. As a handy reference for synthetic work, Part I of both volumes can be recommended. My own preference is for the second parts. These chapters on less common reactions provide illuminating insights into many aspects of organic chemistry, some far afield from the Friedel-Crafts reaction.

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BOOKS RECEIVED

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JAMES B. HENDRICKSON. "The Molecules of Nature." W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 1965. v + 189 pp. Hardback, \$7.00; paperback, \$3.95.