

solution was flooded with water. Large, flaky white crystals separated. The product was recrystallized eight times from a 1:8 acetone-water mixture, avoiding undue heating, and was then dried *in vacuo* at 60° for 8 hr. *Anal.* (by Alfred Bernhardt, Microanalytical Laboratories, Max Planck Institute, Mülheim, Germany, with values calculated for  $(i\text{-Am})_4\text{NB}(i\text{-Am})_4$  given in parentheses): C, 80.73 (80.88); H, 15.26 (14.94); N, 2.69 (2.36). The compound which had m.p. 181° dec. was nonhygroscopic and was readily

soluble in acetone, acetonitrile, and nitromethane, and only very slightly soluble in methanol.

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## BOOK REVIEWS

**Technique of Inorganic Chemistry, Volume I.** Edited by HANS B. JONASSEN and ARNOLD WEISSBERGER. Interscience Publishers, John Wiley and Sons, Inc., 605 Third Ave., New York 16, N. Y. 1963. 268 pp. 6.5 × 9.5 cm. Price, \$9.50.

The stated objective of this companion series to "Technique of Organic Chemistry" (Weissberger, Interscience) is "to present in a comprehensive manner the various techniques used specifically in inorganic chemistry and radiochemistry." Within the broad scope of this objective, Vol. I of "Technique of Inorganic Chemistry" succeeds admirably well. It contains six very well-written and thoroughly documented chapters. Brief statements of the contents of these chapters are given below.

"Determination of Formation Constants of Complexes" by Sture Fronaeus contains a short discussion of calculation techniques and a more lengthy consideration of experimental methods.

"Techniques with Nonaqueous Solvents" by Alexander I. Popov considers nonaqueous solvents with respect to selection of solvent, synthesis in a solvent, liquid-liquid extraction, and potentiometric and conductometric studies.

"Fused Salt Techniques" by John D. Corbett and Frederick R. Duke considers techniques with respect to apparatus, preparation and purification of materials, studies of equilibrium and dynamic properties, and spectroscopic and diffraction methods.

"Spectral Measurements in High Pressure Systems" by W. W. Robertson discusses windows, pressure-transmitting fluids, high pressures at high temperatures, and intensity measurements.

"The Use of Electric Discharges in Chemical Syntheses" by William L. Jolly discusses in detail electrode discharges, electrodeless discharges, arcs under liquids and solutions, and arcs in flowing gases.

"Differential Thermal Analysis" by W. Wendlandt considers instrumentation, factors affecting results, quantitative aspects of differential thermal analysis, and reaction kinetics and applications to chemical problems.

While the other chapters in Vol. I are restricted to relatively special topics which are either thoroughly discussed or documented, "Techniques with Nonaqueous Solvents" is general in nature, illustrating generalizations with a few selected examples. Unfortunately, by restricting the discussion to generalizations, techniques which are intimately related to specific solvent systems are not necessarily discussed and a vast body of information is ultimately ignored, in spite of Prof. Popov's extensive bibliography. In the opinion of this reviewer a more useful presentation would have been to devote an entire volume to nonaqueous solvents with perhaps an introductory chapter, such as Prof. Popov's, followed by more detailed discussions of techniques related to specific solvents.

This reviewer was surprised and disappointed to note that vacuum technology is not listed in the contents of the existing volumes (I, II, III) of this series. Hopefully a volume or at least a chapter will be devoted to this important topic in a future volume of the series.

The contents of Vol. I and III do not appear to have a coherent plan. Topics for each volume have been chosen, seemingly, at

random. Although Vol. II is devoted to "Nuclear Chemistry" exclusively, it is of interest to note that "Technique of Handling Highly Active Beta- and Gamma-Emitting Material" is presented in Vol. III. Considering the apparently haphazard arrangement of topics plus the relatively small size and high price of Vol. I, perhaps Vol. I and III should have been combined into a single volume, thereby minimizing the cost of the series.

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**Oxidation Mechanisms. Applications to Organic Chemistry.**

By ROSS STEWART, University of British Columbia. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1964. 179 pp. 16 × 23.5 cm. Price, \$7.50.

The oxidation of organic compounds has attracted the attention of countless chemists, resulting in a tremendously complex literature. Professor Stewart is to be commended for having picked and chosen well. After first defining what he means by oxidation, he goes on to describe equivalence in oxidation reactions and breaking of carbon-hydrogen and carbon-carbon bonds. Next, he discusses most of the better known oxidants for organic compounds. These include chromic acid, permanganate, and other transition metal derivatives, the so-called glycol-cleaving group, various nonmetallic oxides, including dimethyl sulfoxide, peroxides, and various miscellaneous agents such as quinones. He concludes with a chapter on "Biochemical Oxidation Mechanisms."

Each topic is considered carefully and completely from the standpoint of scope and reaction mechanism. It is impossible to completely satisfy everyone on such a broad field; the reviewer, for example, would have liked to see a more complete discussion of dimethyl sulfoxide oxidations and mention of oxidative coupling reactions, particularly oxidative polymerization of phenols. However, Prof. Stewart has in general done an excellent job in choosing and presenting his material.

He is to be particularly commended for his chapter on biochemical oxidations. It is an especially concise summary of this frequently confused area. The information is well presented, particularly for those who have some previous acquaintance with biological systems. For the general reader, however, an additional introductory paragraph explaining the interrelationship of the various biological oxidations would have been useful. Those without a modern biochemical background may regard the chapter as series of interesting but unrelated essays, although those who persist to the section on "Biochemical Machines" will be well rewarded.

The book is well written and easy to read. The format is pleasing and the text relatively free of misprints.

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