research, administrative and academic assignments. Ralph Ely, Jr., who is active in the Society's Isotope and Radiation Division, spent a number of years in research and development at Westinghouse and at Nuclear Science and Engineering Corporation following completion of his graduate work at Pittsburgh. Robin Gardner, with a Ph.D. from Penn State, was at ORNL and at ORINS, directing at the latter, a program of engineering applications of isotopes. After completing graduate studies at MIT, Harold Richter was at the US Naval Radiological Defense Laboratory and at Nuclear Science and Engineering Corporation where he developed new methods of radiochemical analysis and of low-level radioactivity techniques.

This copious background of experience germaine to the topic makes their review even more meaningful.

Technique of Inorganic Chemistry, Volume One. Edited by Hans B. Jonassen and Arnold Weissberger. Interscience Publishers, New York and London (1963). 268 pp. $9.50.

This book is one of a series on inorganic chemistry intended to be companion volumes to the well known *Technique of Organic Chemistry* edited by A. Weissberger, et al. Each of the six chapters in Vol. I of the inorganic series covers a different subject and is written by a different author. In general, the authors have competently met the objectives established by the editors: "A treatment of the theoretical background and a critical evaluation of the merits and limitations of the techniques are included in each chapter".

The first chapter, "Determination of Formation Constants" is written by Sture Fronaeus, The University of Lund, Sweden. This chapter (33 pp., 84 ref.) is well organized and is written in a scholarly manner. Since the author relies heavily on mathematics to tell the story, the chapter is not written for the casual reader but for those who are interested in a basic understanding of the described experimental techniques.

Alexander I. Popov, Michigan State University, is the author of the second chapter, "Techniques with Nonaqueous Solvents". This chapter (61 pp., 164 ref.) will serve as a general introduction to techniques used in non-aqueous studies and as an excellent source of references to the literature. The author's goal was " . . . to cover only some rather broad general areas of work with non-aqueous solvents and to illustrate the generalizations with a few specific examples". The author met these objectives; however, the reviewer felt that the discussions of the use of non-aqueous chemistry in synthetic work was weak and the discussions on the criteria for solvent purity was inadequate.

The third chapter "Fused Salt Techniques" (47 pp., 216 ref.) is co-authored by John D. Corbett and Frederick R. Duke (Iowa State University). The authors discussed the subject under the headings of (1) General Apparatus and Methods, (2) Preparation and Purification of Materials, (3) Equilibrium Properties of Fused Salts and (4) Dynamic Properties (electrical conductivity, and ionic transport) of fused Salts. A major section (21 pages) of the chapter was used to discuss "Equilibrium Properties of Fused Salts". This section is devoted to discussion of experimental methods primarily pertaining to condensed phase equilibrium, cryoscopy, vapor pressure and vapor equilibria, calorimetry, density, surface tension, potentiometry, and other equilibrium studies. In a few instances, the authors describe the equipment but fail to describe the method adequately; overall, however, the chapter is well written and will serve as an excellent guide to fused-salt techniques.

Spectral measurements in high-pressure systems are covered in the fourth chapter. The bulk of the chapter (15 pp., 38 ref.) is written by W. W. Robertson, University of Texas. A section on "Apparatus for Spectroscopic Measurements Above 10 Kilobars" (5 pp., 23 ref.) is written by H. G. Drickamer. This chapter is well written and the diagrams of high-pressure seals, windows, etc. are clearly drawn and described. The subject matter is primarily devoted to high-pressure equipment design as indicated by the subject headings: (1) Window Designs, (2) The Strength of Window Materials, (3) Pressure-Transmitting Fluids, (4) Simultaneous High Pressures and High Temperatures, (5) Intensity Measurements and (6) Apparatus for Spectroscopic Measurements Above 10 Kilobars.

In the fifth chapter (27 pp., 83 ref.), "The Use of Electric Discharges in Chemical Syntheses" is discussed by William L. Jolly, University of California. The main subject headings are Glow Discharges and Arcs. The chapter is well written and the author clearly indicates the potential and limitations of electrical discharges in chemical synthesis. The chapter is devoted primarily to discussions of experimental equipment and techniques for the use of electrical discharges in laboratory synthesis.

The last chapter, "Differential Thermal Analysis", is written by W. W. Wendlandt, Texas Technological College. In this chapter (44 pp., 162 ref.), the major subjects discussed are: (1) Theory of Differential Thermal Analysis, (2) Instrumentation, (3) Factors Affecting Experimental Results, (4) Quantitative Aspects of Differential

Thermal Analysis, (5) Reaction Kinetics and (6) Applications to Chemical Problems. The author concentrates primarily on experimental methods with a limited discussion of experimental equipment. The potential and limitations of "Differential Thermal Analysis" techniques to chemical studies are clearly defined.

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About the Reviewer: Dr. Arthur D. Tevebaugh is currently a Senior Chemist in the Chemical Engineering Division of Argonne National Laboratory. He formerly worked at the Knolls Atomic Power Laboratory and the Research Laboratory of the General Electric Company, and at Iowa State University on the Manhattan Project. In addition to experience in the field of nuclear-reactor chemistry, he has worked in the areas of inorganic polymers, fuel cells, and thermoelectric materials.

Technique of Inorganic Chemistry, Volume Two. Nuclear Chemistry. by Noah F. Johnson, Eugene Eichler, and G. Davis O'Kelley. Interscience Publishers. 190 pages. $8.00.

The authors define Nuclear Chemistry as the use of chemical techniques in the solution of nuclear problems, and Radiochemistry as the use of radioactive species to solve chemical problems. Many of the principles and experimental techniques of these two fields overlap, and this book will be useful to both groups of investigators. In the last ten years the most striking changes in nuclear chemistry have been in the type and complexity of instrumentation used for the detection of nuclear radiations.

The longest and best chapter of the book, comprising about half of its entirety, deals with the detection and measurement of nuclear radiation (Chapter VI). Quite detailed information is presented on all the major counting methods in use today, including a clear exposition of the basic physics underlying the operation of these instruments. The authors give an excellent discussion of the principles, construction, and uses of semiconductor detectors. Another useful feature of Chapter VI is the section on auxiliary electronic components. The treatment is brief, but serves to guide the reader to what is available in amplifiers, scalers, pulse-height analyzers, and coincidence circuitry.

Another highlight of the book is the chapter on the production of radionuclides. For those unfamiliar with the subject, the authors explore such practical matters as the preparation of accelerator targets and their cooling, and they survey the intensities and energies of the available charged-particle sources. Details are given of pile-irradiation techniques, including drawings of pneumatic-tube sample carriers in use at Oak Ridge, and devices for handling irradiated solutions.

We believe that the authors might well have included more information on the production of monoenergetic charged particles and neutrons, since so much work is being done with these sources. Some discussion could also have been given to the measurement of neutron flux, both monoenergetic and thermal, and to the use of semiconductor detectors for the study of charged-particle reactions in an accelerator beam. All of this has of course been discussed elsewhere, but this book might have served as an introduction to these current problems, and a source of the relevant literature.

The treatment of the remaining subjects in the book is concise and clear. The chapter on radioactive decay covers the growth and decay laws adequately, and explains the various decay processes in a lucid manner. The chapter on interaction of radiations with matter is intended to enable the reader better to understand the basis for the material in the later sections on counting, sample preparation, and absorption corrections. This is accomplished in a concise, clear presentation. Chemical separation techniques are sketched very briefly to acquaint the reader with new procedures, and to point out new problems that an experienced chemist might encounter on first working with carrier-free samples.

The cost of the book, $8.00 (four cents per page) seems rather high.

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About the Reviewers: C. E. Crouthamel is now the group leader of the Regenerative Fuel Cell program at Argonne National Laboratory. His graduate work at the University of Iowa (Ames) was in inorganic chemistry.

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