
 BOOK REVIEWS

Anleitungen für die Chemische Laboratoriumspraxis. Band IX. Tabellen zur Röntgen-Emissions- und Absorptions-Analyse. By Dr. KONRAD SAGEL, Wissenschaftl. Mitarbeiter im Metall-Laboratorium der Metallgesellschaft A. G. Frankfurt (Main). Springer-Verlag, Heidelberger Platz 3, Berlin-Wilmersdorf, Germany. 1959. vii + 135 pp. 16 × 23.5 cm. Price, DM. 27.—.

This book of tables for the X-ray analyst, compiled by an eminent metallurgical authority, is meant primarily for rapid reference purposes in the industrial laboratory. The first 36 pages are devoted to a brief presentation of the principles of X-ray emission and absorption analysis, both qualitative and quantitative, and to the German instrumentation. This section is followed by a series of 35 tables and 6 graphs of wave lengths in KX. units and critical voltages (KV.) plotted against the angle θ values and corresponding $K\alpha_1$, $K\beta$, $L\alpha_1$, and $L\beta_1$ characteristic wave lengths for CaF_2 (200 and 111 reflections), LiF, NaCl, CaCO_3 , quartz (1011 and $10\bar{1}0$ reflections), pentaerythritol, gypsum, mica, sucrose and corundum crystal analyzers. The tables include atomic energy levels, K, L, M, N series emission, and K and L series absorption wave lengths; mass absorption coefficients, data for the various crystal analyzers mentioned, mathematical functions, etc. Much of this information is provided in up-to-date forms in the United States in the "Handbook of Chemistry and Physics" (Chemical Rubber Publishing Co.), the "Lange Handbook" (McGraw-Hill Book Co.), brochures of manufacturers of X-ray equipment, and elsewhere.

It is a complete mystery why Sagel has listed wave lengths in the old Siegbahn KX. units (based upon erroneous value of the electronic charge so that crystal and ruled grating data were discrepant) instead of absolute Ångström units. Of course KX., is converted to Å. by the correction factor 1.00202. The true consistent values are now listed in the Handbooks and in contemporary papers. Even granted that the older spectroscopic data in the literature are all in the Siegbahn units, there seems to be no valid reason for this retarding for present research and testing. This book, well printed and attractively bound in pliable plastic, may well be a useful compendium of data for the X-ray analyst, especially in Europe.

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Induced Oxidation. By W. P. JORISSEN, Formerly, Reader in Inorganic and Physical Chemistry, University of Leiden (The Netherlands). D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1959. x + 208 pp. 15.5 × 23.5 cm. Price, \$8.75.

The monograph "Induced Oxidation" by Professor Jorissen describes primarily the extensive and valuable contributions of its author and associates and the schools represented by Engler, Böeseken, Haber, and other European contemporaries to the field of *induced oxidation* or *oxygen activation*. One may be surprised in reading this volume with the many important applications found for induced oxidation not only in the elucidation of mechanisms of oxidation, but in such important applications as control of inflammation and explosion limits in gases, retardation and control of cancer, promotion of biological processes involving oxidation, e.g., combustion of lactic acid promoted by ascorbic acid. Moreover, one may be especially interested in the links provided by this work and its author with the great Dutch scientists Van't Hoff and van der Waals and with other renowned European scientists of the late 19th and 20th centuries, including among others Arrhenius, Nernst, Christiansen, Kramers, Haber, LeChatelier and Bone.

In this volume the author uses a style characteristic of the old school of chemists in which experiments are sometimes presented in seemingly irrelevant and unimportant detail. While this may seem objectionable to a casual reader, careful

study will permit one to experience the historical and educational value of this style especially in connection with the development of many of the important modern concepts of chemistry. Certainly one cannot study this volume without being excited with new ideas suggested to him from time to time by the occasionally incomplete, yet enlightening, results described in the detail characteristic of this style. A unique feature of this work is the occasional appearance of paragraphs entitled "Suggestion" or "Suggestion for further Research" which illustrate, perhaps, that the author himself experienced the same generation of ideas as will reward one who makes a careful study of this volume.

The work is divided into three main parts. Chapter I discusses experimental results and ideas in the development of the concept of oxygen activation which the author prefers to call *induced oxidation*, including the older concepts of "nascent oxygen," the development of the concept of equipartition of oxygen between acceptor and promoter in the process of induced oxidation, and the development of the chain mechanism which led eventually to the most satisfactory understanding of induced oxidation, especially in some of the more complicated organic oxidation reactions. Chapter II describes the oxidation of organic fuels and gaseous mixtures, and adds a great deal of insight into the mechanism whereby explosion and inflammability limits, particularly the lower limit, may sometimes be controlled. Finally Chapter III treats various biochemical aspects of induced oxidation, and presents information highly suggestive of possible fruitful methods of approach, especially in the control, if not the actual cure, of cancer.

This monograph should be of great value to chemists, especially in view of the long and varied experience of its author. It is to be hoped that others with like experience and stature who have not already done so will be influenced by this work to present similarly their own contributions to the field of chemistry.

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Thermodynamics and Statistical Thermodynamics. By JOHN GELDART ASTON, Professor of Organic Chemistry and Director of the Low Temperature Laboratory, and JAMES JOHN FRITZ, Associate Professor of Chemistry, The Pennsylvania State University. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1959. xiv + 556 pp. 16 × 23.5 cm. Price, \$8.25.

This book is the text which has been used at Pennsylvania State University in recent years for a one-year graduate course in Thermodynamics and Statistical Thermodynamics. The emphasis on spectroscopic and other molecular data as the source of ideal gas thermodynamic quantities is heavy, as may be seen from the space allocated to the various chapters: Scope, 3 pages; Units, 13; History of First Two Laws, 8; Equations of State, 13; First Law, 21; Second Law, 34; Phase Equilibria for Pure Substances, 9; Partial Molal Quantities, 19; Gibbsian Thermodynamics I, 12; Imperfect Gases, 22; Solutions of Nonelectrolytes, 21; Equilibrium Constants, 24; Solutions of Electrolytes, 15; EMF of Cells, 12; Variables Other Than P , T , Composition, 21; Energy Levels and Spectra, 61; Statistical Mechanics, 20; Statistical Mechanical Calculations for Ideal Systems, 27; S.M.C. for Diatomic Gases, 22; S.M.C. for Polyatomic Gases, 19; Crystals, 18; Magnetic Effects, 14; Gibbsian Thermodynamics II, 34. There are in addition ten appendices, occupying 79 pages, of which 40 cover material one might normally find in a Physics course on molecular structure.

The authors make little attempt to hide their disinterest in the classical methods of empirical thermodynamics. For example, in the chapter on partial molal quantities, after a very brief introduction, they state: "The following section gives detailed directions for specific techniques which are useful in determination of partial molal properties. It will