while in the temperature range 315 to 365° the least squares probable error in $\mathfrak{D}_{Na}$ varies between 1.2 and 1.8% (40 experimental points) and that in $\mathfrak{D}_{NO_3}$ lies between 0.7 and 1.1% (18 experimental points).

The following facts appear significant. The heat of activation for self-diffusion is independent of temperature in the range studied and is the same for both anion and cation within experimental error. The ratio of the absolute rates of self-diffusion of the two ions is approximately, but not exactly, proportional to the inverse square roots of their masses, reminiscent of Graham's law of effusion. We have found that the Nernst–Einstein equation is not applicable to reliable computation of the electrical conductance of fused sodium nitrate from the self-diffusion coefficients.

Detailed information and theoretical considerations about self-diffusion in fused sodium nitrate and other molten salts will be published later.

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BOOK REVIEWS

An Introduction to Quantum Statistics. BY WILLIAM BAND, Professor of Physics, The State College of Washington, Pullman, Washington. D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York, N. Y. xiii + 342 pp. Price, $6.00

This book is written for physicists and specifically for post graduate students in physics and physical chemistry. In order to use it the reader should have the usual mathematical requirements for a physics degree and should be well acquainted with quantum mechanics. However most post graduate students in physical chemistry have also studied these disciplines and it is well worth their while to possess this volume. Especially is this true because many examples throughout this book are taken from the fields of physical chemistry, chemical thermodynamics and statistics. The arrangement of the material contained in this volume is carried out in a most satisfactory manner. The simpler cases precede the more complex topics and the latter are built closely on the earlier material presented.

Another and most valuable feature of the book is the set of problems outlined at the end of each chapter. The student who works these exercises will indeed gain most definite knowledge of the subject matter. Also located at the end of each chapter is a list of references for further study for the use of those students who wish to pursue this science in even greater detail than is portrayed in this book. The fifteen chapters carry the following titles: I, Review of Quantum Mechanics; II, The Formalism of Statistical Mechanics; III, Statistical Interpretation of Thermodynamics; IV, The Partition Function in Classical Statistics; V, Equilibrium between Phases; VI, Chemical and Dissociative Equilibrium; VII, Assemblies of Dependent Systems; VIII, Independent Systems with Quantum Degeneracy; IX, Phase Equilibria Among Quantum Degenerate Systems; X, Dissociative Equilibrium Among Quantum Degenerate Systems; XI, Quantum Degenerate Assemblies of Dependent Systems; XII, The Grand Partition Function and Its Applications; XIII, General Theory of the Liquid Phase; XIV, Some Solid State Problems; XV, Fluctuations and Nonequilibrium Phenomena.

Anyone interested in these highly theoretical and therefore most important aspects of physics and chemistry must know and possess this book. The individual who already has acquaintance with this field will be delighted by the very careful presentation of a complex subject.

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Advances in Cancer Research. Volume III. Edited by JESSE P. GREENSTEIN, National Cancer Institute, National Institutes of Health, U. S. Public Health Service, Bethesda, Maryland, and ALEXANDER HADDOW, Chester Beatty Research Institute, Royal Cancer Hospital, London, England. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. viii + 369 pp. 16 × 23.5 cm. Price, $8.50.

The third volume contains a particularly lucid review by Doll of the epidemiology of lung cancer. In it appears an excellent analysis of the etiological factors including tobacco, industrial hazards and atmospheric pollution. In his concluding remarks on the carefully presented arguments concerning the role of smoking he says:

> "In the author's opinion, taking into consideration the philosophical principle of Occam's razor which has already been referred to, the facts are such that the hypothesis that cigarette smoking is a cause of the main histological types of lung cancer should be accepted. They also, in his opinion, justify a strong presumption that the smoking of pipes and cigars is, in this respect, relatively innocuous. The discovery that a known and powerful carcinogen is present in tobacco smoke in significant quantity strengthens the credibility of the conclusion, but it has yet to be shown experimentally that the substance concerned has a direct action on the bronchial mucosa."
>
> "The great majority of the observed facts accord with the hypothesis, but the picture is not yet complete. We need to know, in particular, why the mortality from the disease in the United States is so low relative to the past consumption of cigarettes; and why the association which appears to exist between cancer of the larynx and cigarette smoking has not been reflected in an increase in the incidence of cancer of the larynx comparable to that believed to have occurred with cancer of the lung. The data on the significance of inhaling are also conflicting, and it is uncertain whether the difference between the effects of smoking tobacco in the form of cigarettes and in a pipe can be attributed to differences in the extent to which the smoke is usually inhaled or whether it is necessary to postulate some other mechanism. These fields of uncertainty are, however, small in relation to the extent of established knowledge and do not justify throwing doubt on the main conclusion."

In a very comprehensive review by Morris of the experimental development and metabolism of thyroid gland tumors,