

is considerable overlap in the presentation of theories of the liquid state in chapters 4, 6, and 7. A reasonable editorial effort should have eliminated these defects.

LECTURES AT HEIDELBERG

PHYSIKALISCHE CHEMIE. Ein Vorlesungskurs (2nd ed.). By Klaus Schäfer. 432 pp. Springer-Verlag, Berlin and New York, 1964. DM 36.

by *M. E. Straumanis*

Klaus Schäfer is a well known professor of physical chemistry at the University of Heidelberg. The book originated from lectures given to students of chemistry there.

The outline of the book follows the same pattern as proposed by the School of Eucken. A large part of the text (about 150 pages) is devoted to thermodynamics, especially chemical thermodynamics, whereby the calorie is still used, although the value in joules is mostly added. However, the other parts of physical chemistry are not at all neglected: following thermodynamics, on about 50 pages electrochemistry is discussed, and then on 20 pages chemical kinetics. The first 56 pages of the book are devoted, according to the old pattern, to gas laws, liquids, diluted solutions, and the kinetic theory. However, already on page 13, Maxwell's velocity distribution law is introduced.

The last 142 pages deal with the structure of matter, starting with the old quantum theory of atoms, and continuing with wave mechanics (de Broglie, Heisenberg, Dirac, Schrödinger), in application to various chemical bonding problems, such as formation of molecules, organic compounds, and crystal lattices, including the structure of metals. Some facts and thoughts concerning nuclear chemistry, nuclear energy, and the structure of nuclei are added.

There is no colloid and surface

* * *

Professor Straumanis, who is now at the University of Missouri at Rolla, was for many years a professor of chemistry at the University of Latvia. During this time he worked and studied in Germany on a number of occasions.

chemistry, no photochemistry, no x-ray analysis, and there are no phase diagrams, since these topics are covered in separate, special courses in Germany. No exercises are given in the book, although the application of many equations is sufficiently explained.

The book is very concise and uses mathematics extensively. There is hardly a page without equations and there are no superfluous words in the text. All mathematical expressions are given in a form which permits their derivation. Hence, the mathematical requirements are not low: one has to have a good knowledge of the operations of differentiation and integration, differential equations, and analytical geometry. However, the author warns the student not to overestimate the significance of the mathematical tool in its application to physical chemistry.

It seems to the reviewer that in some parts of the book, the mathematical language is too heavy for a chemistry student, but the difficulty is balanced by the very clear writing and appropriate explanations in the text. The book can be recommended to those, who in addition to the requirements mentioned above, have a sufficient knowledge of German. There are no bibliography and no author index in the book. It is well printed and makes, like many other Springer editions, a good impression.

THE PUNISHMENT FITS THE CRIME

THE NEUTRON BEAM MURDER. By Terry Johnson King. 190 pp. Abelard-Schumann New York, 1965. \$3.50.

by *Dietrick E. Thomsen*

Murder by neutron beam is one of the more appalling possibilities provided by modern technology to the vindictive and envious. It is not difficult to accomplish if the victim is doing an irradiation experiment at a reactor and the murderer can get in and secretly replace the beam shielding with balsa dummies. It might also provide nontraditional difficulties for coroners and other forensic physicians, but in this novel they do not get into the act. From the first page, the reader

knows who the murderer is, and the interest is on the means he uses to accomplish his objective (the crime occurs about halfway through the book) and what happens afterward. Such detective work as occurs is done ad hoc by, of all people, a university vice president.

Mrs. King's novel differs from most of the genre in another respect: It is not simply an amusing criminal mystery; it has also the aspects of a medieval morality play. The author is the wife of a nuclear engineer at the University of Miami and seems to have had much opportunity to become familiar with the soul searchings of scientists about their responsibility for the use of the destructive inventions of recent years. She has written something of a nightmare for these people.

Houston Rutherford, chairman of the physics department in a fictional Florida university, is a man of peace and goodwill. In the same department is Rutherford's villain and victim, one Crozier. Crozier is working on a way to seed nuclear bombs with radioactive cobalt, thereby to kill and overkill.

Rutherford thinks that Crozier will become director of a new institute and gain the opportunity to push his nefarious research to the ultimate limit, and this is likely to mean doom for the human race. Rutherford decides to kill Crozier. The horror in the story arises from contemplation of the evil that a well meaning man can do when he once decides that the salvation of the world depends on him and loses trust in the good intentions of his fellows.

The book is not likely to get any prizes for style, but Mrs. King's prose is easy reading when she keeps it tight. When she lets it go, the result is sometimes baroque. The dialogue occasionally sounds a little contrived too. Her people sometimes talk as if they were in a movie instead of life. Nevertheless, it is an engaging and readable book. The plotting is good; very few occurrences are suspected beforehand, and the end is something of a poetic-justice reverse twist for a man of Rutherford's character.

* * *

Dietrick E. Thomsen is editor of the PHYSICS TODAY book department.

Academic Press Textbooks in Physics

IN THE FOREFRONT OF SCIENTIFIC PUBLISHING



Introduction to Electronics

by Theodore Korneff

This book is an introduction to fundamental concepts in electronic circuits. An operational viewpoint is stressed, with emphasis on circuit behavior. Linear approximations and graphical solutions for vacuum and solid state diodes and triodes are included with examples to enable the student to do much of the preparation in self-study. Transistors are treated after the presentation of the material on vacuum tubes. This book gives the student the background to design basic circuits for his own use and for more intelligent use of laboratory equipment.

CONTENTS: DC Circuits. AC Circuits. Filters and Tuned Circuits. Diodes. Power Supplies. Vacuum Tubes-Graphical. Voltage Amplifiers-Analytical. Power Amplifiers. Oscillators. Pulse Circuits and Wave Shaping. Transistors-Graphical. Transistors-Analytical. Transistors-Multistage and Power Amplifier Circuits. The Oscilloscope and Its Uses, and the Electronically Regulated Power Supply.

(K851) April 1966, about 575 pp.

Experiments in Modern Physics

by Adrian C. Melissinos

A working text to be used in the laboratory for a two semester course in quantum physics on an undergraduate and beginning graduate level. Unlike the "cookbook" laboratory manual, however, this book is a text which treats the theory, procedures, and instrumentation of experiments that are the basis of modern quantum theory.

CONTENTS: Experiments on Quantization. Simple Quantum Mechanical Systems. Quantum Mechanical Systems with Large Numbers of Interacting Particles. Useful Techniques. Radiation and Particle Detectors. Scattering Experiments. High Resolution Spectroscopy. Magnetic Resonance Experiments. Time Coincidence Techniques. Elements from the Theory of Statistics.

(M598) March 1966, about 450 pp.

Mathematical Methods for Physicists

by George B. Arfken

Designed to provide the student with the mathematics he will need for undergraduate and beginning graduate study in the physical sciences. Physical examples are heavily stressed to illustrate the relevance of mathematics in science and engineering. The organization of the material is such that large portions of the text may be assigned as independent readings.

CONTENTS: Vector Analysis. Coordinate Systems. Tensor Analysis. Matrices and Determinants. Infinite Series. Functions of a Complex Variable I; Analytic Properties, Conformal Mapping. Functions of a Complex Variable II; Calculus of Residues. Second Order Differential Equations. Sturm-Liouville Theory-Orthogonal Functions. The Gamma Function (Factorial Function). Bessel Functions. Legendre Functions. Special Functions. Fourier Series. Integral Transforms. Integral Equations. Calculus of Variations.

(A987) March 1966, about 675 pp.

Physics of High Temperature Plasmas:

AN INTRODUCTION

by George Schmidt

This text is designed for a two semester course for first or second year graduate students. Developed through classroom use, the book stresses the physics of the subject rather than the mathematical formalism, and attempts to help the student develop a thorough understanding of the relationship of the physical systems to their corresponding models.

CONTENTS: Introduction. Motion of Charged Particles in Electromagnetic Fields. Plasma Equations: General Laws. Magnetohydrodynamics of Conductive Fluids. Hydromagnetic Stability. Plasma in the Steady State. Oscillations and Waves in Uniform Plasmas. Waves and Instabilities in Bounded Plasmas. Collisions in Plasmas. Appendices.

(S093) February 1966, about 360 pp., \$12.95

Crystal Physics

by G. S. Zhdanov

An extraordinary introductory text to the subject of crystal physics, this book can serve as the basis for a first year graduate course in solid state physics. The book thoroughly treats the most basic subject in solid state physics rather than briefly describing a variety of phenomena as do so many other texts of this nature.

CONTENTS: Introduction to Quantum Mechanics. Atomic Structure and the Periodic Table of Elements. The Quantum Theory of Interatomic and Intermolecular Interactions. The Basic Types of Chemical Bond. The Symmetry of Atoms, Molecules and Crystals. The Structure of Crystals. Crystal Chemistry. Cohesive Energy. The Electron Theory of Crystals. Electrical Properties of Crystals. Magnetic Properties of Crystals. Phase Equilibrium and Phase Transformations in Alloys. Ordering and Disorder of the Atomic Structure of Alloys. Formation and Growth of Crystals. Thermal Properties of Crystals. Self Diffusion and Diffusion in Crystals. Mechanical Properties of Crystals. Appendices. Bibliography. Index.

(Z120) Winter 1965-1966, about 500 pp.

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by Jerry B. Marion

(M224) 1965, 576 pp., \$11.50

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