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SEMICONDUCTING LEAD CHALCOGENIDES

By Yu. I. Ravich, B. A. Efimova, and I. A. Smirnov

A VOLUME IN MONOGRAPHS IN SEMI-
CONDUCTOR PHYSICS*

Edited by L. S. Stil'bans

Translated from Russian by **Albin Tybulewicz**,
Editor, "Soviet Physics—Semiconductors"

The value of lead chalcogenides as semi-conducting materials only serves to highlight the importance of this book, for it is the first full-scale presentation of theoretical and experimental data on these compounds. Much of the information in this work is either difficult or impossible to find elsewhere. As a result, scientists and engineers interested in lead chalcogenides will find this volume an indispensable sourcebook on such topics.

CONTENTS: Physicochemical properties • Optical and photoelectric properties • Electrical properties • Thermoelectric and thermal properties • Magnetic properties • Band structure and scattering mechanisms (theory and conclusions from experimental data) • Applications of lead chalcogenides • Appendices.

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IMPURITY SPECTRA OF SOLIDS

Elementary Theory of
Vibrational Structure

By K. K. Rebane

Academy of Sciences of the USSR; Institute for Physics and Astronomy, Academy of Sciences of the Estonian SSR

Translated from Russian by **John S. Shier**
NASA Electronics Research Center, Cambridge, Mass.

The spectacular development of the solid-state laser linked with widespread interest in solid-state light sources in general has highlighted the need for this book. Offering the first self-contained elementary treatment of the effect of lattice vibrations on optical absorption, luminescence, and scattering in solids containing impurity centers, it also covers the related problems encountered in the Mössbauer effect—including the theory of Mössbauer spectra and the analogy between Mössbauer and vibronic spectra—and the Franck-Condon principle.

CONTENTS: The adiabatic approximation • Theory of quasilinear vibronic spectra of impurity centers • The relation between vibronic spectra and Mössbauer spectra • Vibronic spectra in improved versions of the theory • Infrared absorption and light scattering spectra • Appendices.

Approx. 250 pages May 1970 \$19.50
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reactions are developed almost entirely within this context. The emphasis throughout is on the intuitive and experimental aspects.

Once a student has completed the main body of the text and the associated problems, he should have a "feeling" for how nuclear properties are measured and how these measurements contribute to our present understanding of nuclear structure. The problems at the end of each chapter are essential in successfully achieving this goal. This leads me, in fact, to the only criticism of the book, that is, the difficulty in extracting information for problem solution from some of the figures. The desire for maintaining both self-containment and brevity has led to a reduction in figure size that makes several of the graphs and diagrams awkward to use in any quantitative way. However, because Meyerhof is scrupulous in always giving references to other sources, this difficulty is minor and will not deter the serious student.

In summary, the author should be complimented for having written a concise and uncomplicated text.

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Physics Chairman
University of Nebraska

Introduction to the Thermodynamics of Charged and Polarized Layers, Vol. 10

By A. Sanfeld

258 pp. Interscience, New York, 1968.
\$11.00

This book deals with a complex sub-domain of chemistry and physics, namely electrochemical phenomena in polarizable media and at interfaces. The approach is that of a generalized thermodynamics, in which local variables and local balance conditions are used to interrelate properties of interest.

Unlike most idealized treatments, A. Sanfeld specifically treats those systems where the permittivity depends upon the field strength. Among the topics treated are the distribution of ions and dipoles in an electric field; the relationship between pressure and other variables in a charged polarized system; the equilibrium properties and the distribution of potential, field and charge in a diffuse double layer; interfacial orientation, association and

dissociation in a diffuse double layer. In general the treatment is formal and thorough. Critical remarks pointing out the validity of an argument, or problems of interest, are interspersed throughout the text. Advantageous use is made of numerical examples in several instances. The references cited are useful and, I believe, essentially complete.

One of the two principal drawbacks is that the book is not really in English. By this I mean that the English is certainly understandable but contains enough grammatical errors and foreign word juxtapositions to make it irritating to read. The other is that the treatment is based on formal thermodynamics. Interest in the subject matter would be greatly increased if problems of physical interest were made the focus of study rather than the techniques of formal thermodynamics.

In all, despite the two minor demerits entered, I think Sanfeld's text is a very useful addition to the literature, and recommend it to all those interested in the properties of electrochemical systems.

STUART A. RICE

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University of Chicago

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