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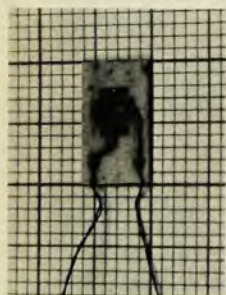
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groups, since they are well covered in other books. I regret that he decided to leave out the application of group theory to solids.

An irritating feature of the book is the large number of footnotes, often of a nature important enough to be incorporated into the body of the text. I noted few misprints, and because one is not aware that the book is a translation, Gerratt is to be congratulated.

There are, however, several misconceptions concerning point groups: A triangle belongs to D_{3h} not C_{3v} ; the proof given concerning the sum of the squares of all the dimensions of all the irreducible representations of a group is in fact not a proof but a verification; symmetry operations are not used to construct matrix representations, but rather sets of homomorphic transformation operators.

In the field of notation something is left to be desired, the symbols $\oplus$ and $\otimes$ are much to be preferred to $+$ and $\times$ in the decomposition and products of representations; Γ should be used as a symbol for a representation and not for an individual matrix.

However, none of these points nor the brevity of some of the explanations will detract someone already fairly conversant with the field and I expect this book will find its way to the shelves of many chemical physicists.

DAVID M. BISHOP
University of Ottawa
Ottawa, Ontario

Glass Science

R. H. Doremus

349 pp. Wiley, New York, 1973. \$17.95

The importance of research on matter in the glassy state has become widely recognized recently with the industrial development of semiconductor, chalcogenide, and metal-alloy glasses, though silicate-glass and polymer people have been busy at it a long time. This is the first textbook for a course on the subject; it is directed also to persons involved in glass manufacture and to research scientists working on glasses. The author, Robert H. Doremus of Rensselaer Polytechnic Institute, has made important contributions to several fields of glass science.

It is a small book, which covers a wide range of topics at the expense, naturally, of not covering any one topic in depth. To make up for this, the author gives generous and quite adequate lists of references, which any reader could use well. The concern is first with silicate glasses, and second with a general discussion of inorganic glasses. Dore-

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mus brings in organic and polymer glasses only when their properties, or theories about them, are relevant to some aspect of inorganic glasses. On the topics I am familiar with, I find that he mentions most of the important points and gives the right references. Topics covered are formation and structure including phase separation and crystallization; transport, including viscosity and relaxation, diffusion, and electrical properties; chemical and surface properties, including glass electrodes; and optical properties, specifically absorption.

It is an excellent book for the beginner, for whom it was written.

MARTIN GOLDSTEIN
Yeshiva University
New York, New York

Molecular Reaction Dynamics

R. D. Levine, R. B. Bernstein
250 pp. Oxford U. P., New York, 1974.
\$10.00

The scope of chemical kinetics has recently expanded greatly as tools have been developed to penetrate into the molecular mechanisms of chemical reactions. This book is an attempt to give beginning students a general introduction to these recent theoretical and experimental developments. R. D. Levine and R. B. Bernstein have contributed to the field in important respects, and they should be well qualified to write such a book. On the whole the effort would appear to be successful. There is a careful discussion of the dynamics of collisions and the use of scattering as a probe of collision dynamics. The authors consider in some detail the processes involving polyatomic molecules with considerable use of potential-energy surfaces, and with consideration of the relationship between the shape of the potential-energy surface and the way the energy is distributed in the product molecules—and how both of these are related to the angular distribution of the scattered particles. There are chapters on energy exchange and on chemical dynamics, dealing in large part with polyatomic molecules.

One of the questions that is considered at different points throughout the book is that of a reaction intermediate. It is pointed out that a long-lived intermediate will give rise to scattering, in a beam experiment, which is more or less independent of angle, while a short collision will cause directed scattering. The vibrational behavior of a long-lived complex between two alkali-halide molecules is described as an example, with a diagram showing typical behavior.

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