also neglected. Indeed, the treatment of statistical distributions and of the Boltzmann equation is abbreviated to a one-page statement; partition functions are not mentioned, even though the populations of states are computed. Thus, equations 14 and 15 on page 53 are misleading since N_0 is a function of the temperature. I hope these defects will be rectified in a second edition of this useful book. Barrow might find it advantageous to summarize more clearly the diverse structural information that may be derived from spectroscopic studies, including nuclear magnetic resonance.

By comparison with Barrow's book, the second edition of Bak's compact outline suffers considerably. Except for the addition of chapter 6, on nuclear magnetic resonance spectra, the current version differs in no essential respect from the first edition published in 1954. As a compilation of formulas, this book may prove quite handy; it is suitable for a person who knows no spectroscopy but who is conversant with mathematical operations. Bak relies almost entirely on the analytic representation of the solutions of the wave equation for the various models. He discusses these solutions briefly and presents orders of magnitudes, sometimes in tabular form. Practically no data concerning real molecules are included. For each range of the spectrum, he outlines the type of molecular information that may be deduced from the data and the precision that can be attained, and he cites the appropriate expression for the corresponding factor in the partition function.

All books written for students should be scrutinized not only for errors but also for correct but awkward statements that may prove misleading. Neither author discusses what occurs when a photon interacts with a molecule in the case where the resonance condition is not satisfied or gives an adequate analysis of the sequence of events in the case where the resonance condition is satisfied. Barrow fails to explain what is meant by the term *state*. His treatment of two interacting particles, on page 31, is confusing, and on page 53 he sneaks in the condition that both the total angular momentum and its component along some direction must be quantized. There are regrettably many troublesome spots in Bak's book. The invocation of the uncertainty principles to explain the fuzziness of translational levels in many-particle systems will certainly confuse beginners. The potential function, as it is drawn on page 18, leaves a wrong impression of the relative magnitudes of r_e and r when $V = D$. The erroneous formula on page 99 was carried over from the first edition. There are others, but the last paragraph on page 98 is a dilly!

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Mostly for Physical Chemists

Catalysis by Metals. G. C. Bond, Academic Press, New York, 1962. ix + 519 pp. Illus. $15.50.

Although heterogeneous catalysis is well served by a large supply of specialized review articles (for example, those in Emmett's treatise and in the annual volumes of *Advances in Catalysis*), there is a dearth of single-volume monographs. The present book makes a useful contribution by dealing in one volume with the general area of catalytic reactions on metals. The viewpoint is primarily that of a physical chemist. The author makes no attempt to deal with industrial catalytic procedures, and his coverage of descriptive catalytic chemistry is very selective. For example, the hydrogenolysis of benzylic derivatives is not mentioned, Ipatieff does not appear in the author index, and Homer Adkins appears but once. The book will not be of great utility to the organic chemist who seeks merely the best procedure for converting A to B. Rather, the treatment is aimed at the elucidation of the mechanism of heterogeneous catalysis in its broadest sense, and the selection of material is so conditioned.

The introductory portion of the book (150 pages) covers the physics and chemistry of metals, adsorption, and the kinetics of reactions on surfaces. Except for a chapter on catalytic oxidation, the remainder of the book deals primarily with catalytic reactions of hydrogen; this material is organized into chapters on various types of reactions, hydrogenation of carbon-carbon double bonds, isotopic exchange reactions between deuterium and hydrocarbons, hydrogenation of carbon monoxide and of nitrogen, and the like. Considerable emphasis is given to studies that involve isotopic tracers and to the determination of kinetic orders, activation energies, and frequency factors. Some may suspect that the author underestimates the degree to which serious concentration gradients are involved in the data he employs and others, that activation energies and frequency factors are given more space than their contribution to the understanding of the subject warrants.

One finishes the book with the feeling that, although many particular aspects have been well explained, the overall level of explanation is weak and tentative, particularly as it relates to the correlation between the catalytic properties of a particular metal and any of its other properties. This is not the fault of the author but of the present state of our understanding. Bond has written a book which will be widely used by catalytic chemists.

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Potential Laboratory Tool

Absorption Spectroscopy. Robert P. Bauman. Wiley, New York, 1962. xiv + 611 pp. Illus. $12.

This book of over 600 pages is designed both as an elementary text and as a guide for those who need a working knowledge of absorption spectra but to whom the classroom is no longer available. In view of the wide range of subject matter covered, the author has done well in presenting a clear concept of the nature of absorption spectra, of methods for measuring them, of their interpretation, and of their value in qualitative and quantitative analyses and in research.

The book is divided into ten chapters, each of which is followed by a list of pertinent problems that not only enhance the book's value as a text but should also help readers to appreciate absorption spectroscopy's great potential as a laboratory tool. One chapter is devoted to the classical optical principles around which spectrometers are built. Another treats the basic design of instruments and describes in some detail a number of currently available commercial instruments which among them cover the spectral range from infra-