choice of topics in the more experimental adventures, or about the very pronounced emphasis placed on ruby devices. I am also sure many professionals will feel that more or less emphasis should have been placed on their work or on the efforts of others. However, I am far more impressed with the positive features of Lengyel's accomplishment than I am distressed by the inevitable deficiencies of a rapidly prepared book about an almost violently active topic. Lengyel has attempted to be useful to the reader, and he has achieved his purpose with considerable consistency throughout the exposition.

The main topic headings will give some idea of the scope of this monograph: Background Material on Radiation, General Description of Lasers, Solid State Lasers, Fluid State Lasers, Applications and Development. Many readers will benefit from the skill with which Lengyel has enfleshed this skeleton.

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Structural Information

Infrared Absorption Spectroscopy, Practical. Koji Nakanishi. Nankodo, Tokyo, Japan; Holden-Day, San Francisco, Calif., 1962. xii + 223 pp. Illus. $8.

This English-language edition of a text originally written and published for the Japanese market was published at the instigation of Carl Djerassi, who has provided an explanatory foreword. The book's title could be a bit misleading, since experimental aspects of infrared spectroscopy are rather briefly treated. Actually the book is intended for use as a guide in interpreting infrared spectra of complex organic molecules—that is, the problem of deducing structural information from the spectrum of an unknown substance. Its publication may cause some surprise, for two excellent and widely used sources of data are already available on the American market.

It is reasonable to inquire whether this is merely an updated and abbreviated Bellamy. The answer is unequivocally no. This is an excellent work in its own right. Nakanishi's systematic organization of the material is excellent and it brings an amazing wealth of information in easily accessible form to the user's fingertips. The references that follow each of the tables of data on a given functional group are up to date (1961) and well chosen.

A welcome innovation is the reproduction of the spectra of commonly employed solvents, and I was pleased to note that Young, DuVall, and Wright's overtone patterns for various aromatic substitution types are also reproduced. No other source provides such a display of accurate information in a format that is suitable for quick reference use. The average organic chemist will find a great deal of use for this part of the text.

There are novel features in Nakanishi's text that will greatly enhance its value to students of modern organic qualitative analysis courses and to graduate students beginning research work. A series of 85 problems that range over all uses of infrared spectral data in organic chemistry are presented. A major portion of the book (pages 71 to 223) is devoted to these problems and the detailed answers to them. Certainly this is the best way for a beginner to gain experience in interpreting infrared spectra. Each problem contains one or more spectral reproductions, an invaluable aid in learning about the shapes and intensities of the various bands. However, students must pay careful attention to the text interspersed among the tables, for only there (and in an exceedingly terse form) will they learn which bands are the more reliable sources of information. Perhaps only experience can teach that the appearance of bands in the spectrum at some given frequency is not always a guarantee of the listed function. Thus, the unwary will continue to interpret the bands at 910 and 990 cm^{-1} in 2-butanol as a vinyl group.

Credit must be given to the proofreader, since this book is quite free of misprints. I noted only one: a misprint in the table on page 20, which changed the C—H stretching vibration from 2925 to 1925 cm^{-1}. The spectra are well reproduced. The binding is of such poor quality that it is not likely to survive the handling this useful book will receive.

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Nuclear Chemistry

Basic Concepts of Nuclear Chemistry. Ralph T. Overman. Chapman and Hall, London; Reinhold, New York, 1963. xii + 116 pp. Illus. Paper, $1.95.

The author aims this monograph at the level of college undergraduates who have some scientific background; he also hopes to attract workers in other fields who lack training in nuclear chemistry and high school students who wish to add to their regular course material.

The mathematical complexity of the material is minimal, and the book may well be useful to high school students, for Overman's coverage of the field is more complete and systematic than that of other works directed toward high school students. For example, good discussions of interactions of radiation with matter, detection devices, and the often neglected errors and statistics are given. However, the book is written in conventional scientific style and will not excite the reader's imagination as successfully as those written in the Gamow style.

The author misses his other objectives. Bright freshmen can handle (and crave) more challenging material. Overman uses lengthy and confusing discussions to avoid simple mathematical expressions. For example, in treating statistical fluctuations, he shows a Gaussian distribution but omits the mathematical expression for it. There is not sufficient detail given to prepare workers in other fields for experiments involving radionuclides. (Overman's earlier books, written with H. W. Clark, excellently fulfils this aim.)

Space is often wasted when Overman introduces topics and then concludes that they are too lengthy or complicated to discuss. In the space required to write the simple Compton scattering relationship, we instead learn that "there are certain limiting values for the energies, especially when the scattering is at 90° and 180°." Overman gives a clever analogy between decay laws and water flowing from tanks, which is quite effective for parent-daughter relationships including secular equilibrium. But he fails to note the example of constant reactor production of a short-lived species. Then, in the discussion of activation analysis, $(1\text{-}e^{-\lambda t})$ is pulled from a hat.