

Our experiments revealed that the quartz was attacked very slightly during the dissolution of Ag metal in the warm trifluoroacetic acid-hydrogen peroxide mixture. After making suitable corrections for the loss in weight of the quartz vessel, the calculated ratio AgCl:Ag was low by 0.6 to 1.2 parts per thousand. The attack on the quartz vessel and the low AgCl:Ag ratio make it fairly certain that, under the conditions of the experiment, the trifluoroacetic acid breaks down to a slight extent to yield hydrogen fluoride.

The trifluoroacetic acid-hydrogen peroxide reaction has been tested also with a number of other metals in addition to those mentioned above with these results (asterisk indicates clear solution was obtained):

Metal dissolves rapidly: Mg*, Mn, In*, Fe, Pb*
Metal dissolves moderately rapidly: Be*, Al*, Ni*, Sn, W, Sb*

Metal inert to reagent: Cr, Ta, Nb, Au

Elements tested but results indecisive: Si, Zr, Ti, Ga, P, Os, Ir, Pt.

The authors are indebted to Dan S. Kemp for valuable help with part of these experiments. The assistance of a research grant from the National Science Foundation is gratefully acknowledged.

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RECEIVED FEBRUARY 10, 1959

BOOK REVIEWS

The Infra-red Spectra of Complex Molecules. By L. J. BELLAMY, B.Sc., Ph.D., Senior Principal Scientific Officer, Ministry of Supply. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1958. xvii + 425 pp. 14.5 × 22 cm. Price, \$8.00.

Today's explosive growth of infra-red spectra makes this volume a welcome book. The absorption bands with which it deals constitute a kind of molecular language, telling us of the manifold events in the world of atomic partnerships; and the number of recognizable "words" in this language has now grown so large that a "dictionary" containing them all would be almost as large as the unabridged Webster's. Bellamy's book does not strive to be even an abridged dictionary, but is rather a lexicon of usage; and with respect to the language of the infra-red, one may fairly say that it is a kind of Fowler's "Modern English Usage," a uniquely valuable guide.

In the words of the introduction this book is an attempt to present a critical review of the data on which infra-red spectral correlations are based. There are twenty-three chapters; and with the exception of the first introductory and the final concluding chapters, each covers a class of compounds in which the factors influencing the frequencies and intensities of characteristic bands are discussed. These chapters are assembled together in four sets concerned, respectively, with C-C and C-H linkages, with C-O and O-H linkages, with C-N and N-H linkages and with the vibrations involving other elements and groups of inorganic origin. Each set of chapters is followed by half-a-dozen graphs to illustrate typical characteristic absorption bands; and in the introductory chapters there are five correlation charts, a total of thirty-three full-page illustrations. The final chapter (added in this second edition) is a comprehensive discussion of the origin and significance of group frequency shifts. With regard to this chapter, the author says in the preface that the reader would do well to treat small portions of it with the reserve accorded to an author's account of his own activities. This is an unmerited apology; the conclusions of this chapter are especially valuable in pointing the way in a field where guidance is particularly needed, today.

At the end of the book there is the usual subject index, a compound index and a table of reciprocals to use in converting wave-numbers. An author-index would have been helpful as there are 1681 references in the bibliographies placed at the end of each chapter.

Readers from many fields will be interested in this book. As a guide in the use of infra-red spectra for identifying compounds, it is invaluable. Those, who need help in employing infra-red spectra to interpret molecular structure, might welcome illustrations to show the exact types of

motion associated with different bands; but these usually can be found by consulting references. The relations of infra-red spectra to thermodynamic properties are largely omitted, perhaps because such relationships are outside the scope of the book; but the thermodynamic evidence for spectral interpretation is frequently important. However in sum, this volume assembles a compact and clear body of facts and conclusions which will be most helpful to workers in many fields all the way from the theoretical to the applied aspects of the subject.

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Anleitungen für die Chemische Laboratoriumspraxis. Band VIII. Tabellen zur Röntgenstrukturanalyse. By DR. KONRAD SAGEL, Wissenschaftl. Mitarbeiter im Metall-Laboratorium der Metallgesellschaft A. G. Frankfurt (Main). Springer-Verlag, Reichpietschufer 20, Berlin W 35, Germany. 1958. viii + 204 pp. 15.5 × 23 cm. Price, DM 28.—.

This book contains a compilation of formulas, numerical tables and other information (such as a collection of crystallographic data for a large number of compounds) which will be of use to practically any person working in the field of X-ray diffraction. The information is given in four sections: (A) Tables for Indexing Diffraction Maxima; (B) Tables for Intensity Determination; (C) Tables for Analysis of Diffuse Background; and (D) Several Physical and Mathematical Tables. In each section (except D) the tables are preceded by a compilation of formulas and explanatory material.

The only other compilation comparable to this book is Vol. II of Internationale Tabellen zur Bestimmung von Kristallstrukturen (published in 1935 by Gebrüder Bornträger, lithographed in 1944 by Edwards Brothers, Ann Arbor, Mich.), which, of course, is very much out of date (a new edition is to be published soon by the Kynoch Press, Birmingham, England). X-Ray crystallographers, and other people working in the field of X-ray diffraction, will certainly want to have both books. Dr. Sagel's book often contains more information on topics covered by both books. For example, Dr. Sagel gives tables of absorption corrections for plate-like and spherical crystals as well as for cylinders; and his treatment of polarization factors also includes the case of crystal-monochromatized radiation. In those cases where the literature offers a rather wide selection of data, Dr. Sagel has clearly attempted to list information obtained by the best and most modern techniques. His compilation of