

## BOOK REVIEWS

X-RAY ABSORPTION AND EMISSION IN ANALYTICAL CHEMISTRY. (Spectrochemical Analysis with X-rays), by H. S. LIEBHAFSKY, H. G. PFEIFFER, E. H. WINSLOE, AND P. D. ZEMANY, 357 pages, John Wiley and Sons, Inc., New York, 1960, \$13.50.

X-ray spectroscopy as a tool for analytical purposes has advanced rapidly in recent years. What has been sorely needed to keep pace with this advance has been a good text to survey the field and function as a reference source. This book fills these needs in an admirable fashion and has already received wide scale approval by workers in the field. The authors describe lucidly the history and basic theory, the reliability of the x-ray methods, a variety of applications, and all the required equipment, instrumentation, and techniques.

The first part of the book is devoted to the origin and properties of x-rays, the measurement of x-ray intensity, detectors, and to the important analytical method using x-ray absorption. The latter part of the book is concerned with the methods based on x-ray emission. An important chapter on reliability of x-ray emission spectrography is included.

The six appendices consist of tables very useful to the practicing x-ray spectrochemist and a bibliography of element determinations.

Of particular interest to the mineralogist is Chapter 7 which is devoted in part to the analysis of minerals. The potential of the technique as well as some specific applications are described.

This reviewer feels that this book has great value in any laboratory performing x-ray spectrochemical analyses.

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METHODS IN GEOCHEMISTRY. Edited by A. A. SMALES AND L. R. WAGER. Interscience Publishers, New York, 1960. 464 pages. \$13.50.

In this modern day, the geochemist has at his disposal an ever-increasing armament of powerful, but complex, instruments and methods for studying earth materials. The literature dealing with these new tools is mostly periodical, is widely scattered, and is, in some cases, written for audiences other than those interested in earth-sciences. For these reasons this work of Smales and Wager is a very timely one, and a very welcome one.

The book contains ten chapters (plus introduction), written by eleven experts, on methods of geochemical analysis (*sensu vasto*). These are: Collection and Preparation of Materials for Analysis; Analysis by Gravimetric and Volumetric Methods, Flame Photometry, Colorimetry and Related Techniques; Spectrochemical Analysis; Fluorescent X-Ray Spectrography; Stable Isotope Geochemistry and Mass Spectrometric Analysis; Mass Spectrometric Isotope Dilution Analysis; Radiochemical Methods; Radioactivation Analysis; Polarography; Some Modern Chemical Separation Methods.

The list of methods covered by the book is not an exhaustive one: no mention is made of such subjects as powder x-ray diffraction techniques, the electron probe, or geochemical and geobotanical prospecting, among others. This is a minor criticism—the authors have done an excellent job on a number of the most important methods. The book can be recommended both to practitioners of the methods covered, and to geologists who would like to know what laboratory techniques can be usefully applied to their problems.

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METHODS AND TECHNIQUES IN GEOPHYSICS, VOLUME I. Edited by S. K. RUNCORN, 374 pages, Interscience Publishers, 250 Fifth Avenue, New York, N. Y., 1960. Price: \$10.00.

The discussions in Volume I of this series treat subjects that are of primary interest to investigators dealing with the solid earth. Methods of making measurements are stressed. Each section includes a discussion of the particular difficulties that are encountered in making measurements and some theory of the instruments employed. Illustrations in the form of line drawings and half-tone prints have been included generously. Each author had produced a condensation from a diversified bulk of publications. References at the end of each chapter will be of great value to anyone wishing to pursue the types of measurement under discussion.

Each chapter has been written to stand alone as an introduction to measurements in a particular phase of geophysics. This causes a lack of continuity from chapter to chapter. The subjects treated, with their respective authors, are: "Measurement of Temperature Gradient in the Earth," by E. C. Bullard; "The Measurement of Heat Flow over Land," by A. D. Misener and A. E. Beck; "Bore-hole Surveying," by T. Gaskell; "Measurement of the Geomagnetic Elements," by K. Whitham; "Measurements in Paleomagnetism," by D. W. Collinson and K. M. Creer; "The Measurement of Gravity at Sea," by J. C. Harrison; "The Detection of Earth Movements," by P. L. Willmore; "Earth Currents," by G. D. Garland; "Properties of Rocks under High Pressure and Temperature," by D. S. Hughes; "Latitude and Longitude, and the Secular Motion of the Pole," by W. Markowitz.

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CRYSTAL-STRUCTURE ANALYSIS, by MARTIN J. BUEGER. John Wiley and Sons, Inc., New York. xvii plus 668 pages, 329 figs. 1960. Price \$18.50.

This book is a very complete description of the various phases of crystal structure determination, as shown by the Chapter headings, as follows:

- Fundamental diffraction relations
- Quantitative aspects of  $x$ -ray diffraction
- Outline of a crystal structure analysis
- Selection of material
- Measurement of intensities. Geometrical and Physical factors affecting intensities
- Number and distribution of atoms in the unit cell
- The Structure Factor. Plane projections in structure-factor calculations
- Examples of the determination of some simple structures
- Fourier synthesis, general theory. Useful forms of Fourier synthesis
- Reciprocal Space. Symmetry in reciprocal space
- Applications of symmetry to Fourier summations
- Practical methods of summing Fourier series
- Phase determinations for structures having heavy or replaceable atoms. Phase determinations for certain special cases. Direct determination
- Refinement of structure
- Calculation of interatomic distances and angles.

There are numerous illustrations and tables, and there is a list of references at the end of each chapter.

The reviewer knows of no other single publication in which such a large amount of

pertinent information is available. The author has thus added one more item to the already long list of his important contributions to the field of crystal structure determinations.

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ADVANCES IN X-RAY RESEARCH, Vols. 1, 2 and 3. Edited by WILLIAM M. MUELLER.

Distributed by Plenum Press, Inc., N. Y. Prices: Vols. 1 and 2, \$8.50 domestic, \$10.00 foreign, Vol. 3, \$12.00 domestic and foreign.

These three volumes represent the Proceedings of the 6th, 7th and 8th Annual Conferences on Application of X-ray Analysis, sponsored by the Denver Research Institute, University of Denver, for the years 1957, 1958 and 1959. The papers presented, with illustrations are included in these volumes as follows: Vol. 1, 32; Vol. 2, 26, and Vol. 3, 25 papers.

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## TEN MORE YEARS OF NEW MINERAL NAMES

MICHAEL FLEISCHER

Ten years ago (*Am. Mineral.*, **36**, 630 (1951)), I summarized ten years of abstracting new mineral names. The table below is a similar summary of the abstracts in Volumes 36 through 45 of the *American Mineralogist*. These are, of course, my opinions of the names proposed, and many of them are subject to argument.

The most obvious points are that new names are being proposed at a rate more than double that of the preceding ten years, but that the percentage that seem to be valid (56 per cent) is not much improved over the previous decade (47 per cent). More than ever, restraint and care in proposing new names is necessary to keep the science from being swamped.

	Total new names proposed	Valid names	Identical with known minerals	Unneces- sary names for varieties	Insufficient data	Minerals discredited
1951	61	15	40	6	0	13
1952	27	16	8	2	1	12
1953	18	16	1	1	0	7
1954	29	22	1	3	3	31
1955	40	21	4	9	6	7
1956	38	27	9	2	0	5
1957	42	23	4	10	5	25
1958	53	31	6	13	3	15
1959	54	31	5	7	11	20
1960	57	32	6	11	8	4
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	419	234	84	64	37	139
1941-1950	164	77	22	33	32	85