NEW BOOKS

THIN-LAYER CHROMATOGRAPHY, James M. Bobbitt (Reinhold Publishing Corp., 208 pp., 1963, $8.50). This book would be particularly profitable for those of limited experience with thin-layer chromatography. The majority of the book is devoted to tables, diagrams, and references. The table of contents offers an excellent outline of the expanded material it precedes. The index is similarly adequate.

Discussion is presented in a simple style, replete with subject headings in heavy type. Each chapter is allotted to the detailed description of a pertinent phase of TLC (e.g. adsorbents, choice of a solvent system, quantitative thin-layer chromatography). These features qualify this text as a handy reference source for any laboratory using TLC. Most of the information covered in the book has been previously mentioned in various periodicals, but is uniquely combined here into a practical, concise guide. Primarily, the book describes the fundamental physical aspects and ramifications of preparing and documenting TLC. It includes tables of suitable adsorbents and indicators.

For those already engaged in thin-layer work, however, the last chapter is noteworthy. It contains in tabular form most of the specific applications of TLC published prior to 1963. This listing is not only a bibliography as found in the many other reviews on TLC, but also an extensive compilation of specific organic and biochemical compounds and the corresponding adsorbents, developers, and visualization reagents which have been employed to chromatograph them.

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INFRARED BAND HANDBOOK, H. A. Szymanski (Plenum Press, 484 pp., 1963. $35.00) is all tables. Seven pages of introduction, presented in English with partial translations into French, Russian and German, explain how to use the remainder of the book. The main portion of the Handbook, 424 pages, contains a uniform presentation of information relevant to a specific absorption for a specific chemical in the 3610–621 cm^{-1} region of the IR spectrum. Some 8,500 absorptions, 20 to a page, are arranged in order of decreasing wavenumber. Each entry includes the exact wavenumber of the absorption ($\pm$ 1–10 cm^{-1}, depending on the region of the absorption and the quality of the referenced spectrum), the physical state of the sample, the radiation dispersing element if other than NaCl, the structural group responsible for the absorption and mode of the vibration as pertinent, the formula of the chemical and pertinent references from which this information was compiled. Generally, only absorptions of medium or stronger intensity are reported. No spectra are included.

The index is based on empirical formulas using the Chemical Abstracts system. Instead of indicating page numbers, citations are made to wavenumbers and corresponding intensities. Two appendixes contain correlation tables for methyl deformation frequencies (11 pages) and C-N stretching frequencies (4 pages).

The value of this Handbook would depend on the role spectroscopy plays in a particular laboratory. With a known chemical one can find the major absorptions in its IR spectrum if it is included in the Handbook. However, a reference spectrum would give the same information with more complete confidence in the actual identity of the material. With an unknown chemical, correlation tables are most valuable for qualitative identification. Ultimately, reference spectra must again be consulted for more exact identification. The correlation tables in the appendixes to this Handbook are inadequate in scope for this purpose. Since less than 15% of the absorptions compiled are identified as to causative molecular structure, these entries provide little help even in qualitative identification of an unknown chemical even if it should happen to be included in the Handbook.

A reliable empirical formula can save time in using this Handbook, although the empirical formula index does not indicate molecular structure or chemical names unless two or more compounds contained in the Handbook have the same empirical formula. This limits the usefulness of this interesting feature of the Handbook. (A single referral to one of the entries cited in this index does, however, immediately indicate the structure of the indexed compound.) Only about 1,000 compounds are indexed and compiled in this Handbook out of some 43,500 ASTM spectra. Thus, "sorting" through this Handbook by wavenumber could be tedious, especially if in the end the compound of interest was not listed. Furthermore, with about ten compounds having an absorption at the same wavenumber, and allowing for a $\pm$ 5 cm^{-1} variation in a given absorption, about 50 compounds become possibilities at each wavenumber. This requires further sorting and extensive hand cross listing by the user.

This Handbook is apparently trying to fill the gap between the generalities contained in published correlation tables and the exact information found in the extensive published sets of complete spectra and spectra retrieval indexes. This may be the first step in getting IR spectral data into a form that will permit computerized retrieval methods based on key absorptions. However, because of the small number of specific compounds compiled in this present Handbook, this reviewer doubts that many readers of this Journal would find it of enough value to justify the relatively high price of $35.00.

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MAN-MADE TRANSURANIUM ELEMENTS, Glenn T. Seaborg (Prentice-Hall, Inc., Englewood Cliffs, N. J. 120 pp. 1963. $3.95). This little monograph is a concise summary of the synthesis and properties of the transuranium elements. The treatment of the subject is on a very elementary level and is almost wholly descriptive; which is as it should be, for the purpose of the book is to supplement one of the chapters in the textbook for Chemical Education Material Study, "CHEM Study," designed to improve the teaching of chemistry in high school. Thus it is written with high school students in mind, and the breadth of subject matter which is discussed, coupled with its stated objective, bear eloquent testimony to the aspirations of the CHEM Study program.

The text is divided into two parts. The first part deals with the discovery of each of the elements; their position in the periodic table; the experimental methods of investigation with emphasis on chemical techniques; a short discussion of problems and limitations in synthesizing elements of even higher atomic number; and applications of the transuranium elements.

The second part of the book deals with the large-scale synthesis of these elements; their electronic structure; their chemical and physical properties; and finally the nuclear properties of the actinide elements, including discussions of nuclear reactions, α, β and γ decay, and spontaneous fission. Much useful chemical and physical information is given in the form of tables and graphs. The decay properties of the presently-known transuranium nuclides is given in an appendix. For those who wish to dig deeper into the subject there is a list of suggestions for further reading.

While the book is on too elementary a level to be of much use to professionals working in the field, it serves admirably to give the layman a comprehensive picture of this rather exotic and highly specialized field. The second chapter, dealing with the discovery of these elements, is well worth anyone's time to read. In an intimate account, liberally salted with amusing ancedotes, Dr. Seaborg succeeds in conveying the feeling of excitement, as well as an appreciation for the formidable technical problems associated with the discovery of these elements. The book is well illustrated with photographs and line drawings which complement a lucidly written text.

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