

BOOK REVIEWS

Instrumentation for High-Performance Liquid Chromatography, edited by J. F. K. HUBER, Institute of Analytical Chemistry, University of Vienna, Vienna. Elsevier Scientific Publishing Co., P. O. Box 211, Amsterdam, The Netherlands; 52 Vanderbilt Avenue, New York, New York 10017. 1978. xi+204 pp. 17 x 24.5 cm. \$34.75.

The purpose of this text as stated in the preface is ". . . a survey of the general design features and the specific technical solutions in the instrumentation for high-pressure liquid chromatography . . . special emphasis is given to a discussion of the general design principles which will remain relevant even if newer technical solutions are found in the future." The text serves this purpose well. Individual chapters have been contributed by European experts who are actively working in the field. These chapters are, for the most part, easy to read, practical in nature, and thorough.

The chapter on pumps is very well done. Pumps are classified according to pneumatic, syringe, reciprocating and hydraulic amplifier pumps. Basic schematics of each type, together with a clear explanation of the operating principles and a balanced judgment as to the advantages and disadvantages, are provided.

The chapter on solvent gradient systems discusses gradients generated both at atmospheric pressure and high-pressure and should be useful for both purchasers of commercial equipment and those who wish to build their own systems from modules.

The chapter on column design focuses on column dimensions, column materials, column fittings, systems for multiple columns and, finally, column thermostating devices. This is a practical chapter and required reading for any beginners in HPLC.

There is an excellent 17-page chapter on electrochemical detectors with good illustrations and comments. This is in sharp contrast to a short (15-page) chapter by the same author in which refractive index, UV absorption, conductivity and fluorimetric detectors are covered briefly and with no illustrations. Since electrochemical detectors represent less than 5% of all operating LC detectors, this imbalance seems unfair to the reviewer.

There are also chapters on radiometric detectors and LC/MS systems, and the text is concluded with an extensive list of commercially available LC systems, together with specifications of the major items and manufacturers' addresses.

The text is well written and is reasonably current (up to middle 1977). The text is amazingly free of typographical mistakes or technical errors. One minor exception is on page 102, the Waters Prep-pak 500 columns are not 5.7 millimeters in diameter.

Since the authors are European, the emphasis is on European instrumentation. This is informative, however, since little information of this nature is available in the United States.

The text is recommended for workers in the field, particularly those who like to build their own systems; however, the price of \$34.75 will limit the number of individual purchasers.

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The Sadtler Handbook of Infrared Spectra, edited by W. W. SIMONS, Sadtler Research Laboratories. Sadtler Research Laboratories, Inc., 3316 Spring Garden St., Philadelphia, Pa. 19104. 1978. vi+1089 pp. 22 x 29 cm. \$150.00.

The Sadtler collection of ir spectra, one of the earliest to be published on a regular continuous basis, is now well established in the chemical community and can be found in most industrial spectroscopy laboratories and some university libraries. However, a major drawback for small laboratories and individuals is the high cost of such sets. Thus we warmly welcome the publication of this set of approximately 3,000 quality spectra taken with grating instruments.

The wide spectral range of 4000-200 cm^{-1} is an asset. So is the absence of blanked-out regions due to solvents or the matrix since the spectra are measured as neat liquids, melts or KBr wafers. The spectra are arranged in class order, namely, hydrocarbons, halogenated hydrocarbons, N-, Si, P-, S-, O- and finally carbonyl-containing compounds. There are relatively few spectra of natural products, but the collection will still be valuable to the natural products chemist as a source of correlations and characteristic frequencies. Each chemical class section starts with a correlation table between characteristic bands and assignments, and an excellent concise introductory remark which lists characteristic frequencies in order of diagnostic value. For the sake of constructive criticism, some points which could possibly improve the utility of this compendium are listed.

The criterion for compound selection is not clear. The editor states two purposes. The first is to "satisfy the academic need for a small convenient collection of ir spectra relevant to college introductory courses on organic chemistry and supplementary laboratory courses",

whilst the second is aimed at those employed in industry as a reference where comprehensive sets are not available. Since simultaneous fulfillment of these two incompatible objectives is almost impossible, the volume could profitably have been directed more to the latter purpose, i.e., as a mini-reference source, by inclusion of a wider variety of compounds. For example, the nucleic acid bases and nucleosides are only represented by the single compound purine. On the other hand, the catalog carries the spectra of five aliphatic dithiols, which seems to be excessive. A wider representation would be beneficial for the students also.

One additional spectrum could be included in each page without sacrifice in spectral size. The index portion, which consists of a book-order index (67 pp), alphabetical index (80 pp) and Spec-Finder (109 pp), comprises approximately a fifth of the total pages. The indices could be greatly condensed by using two columns instead of one and using smaller print, and a molecular formula index would be more useful than the book-order index which simply lists the compounds in sequence. The Spec-Finder provides a rapid method for retrieving the spectra which have similar absorption bands; although this is useful for more comprehensive sets such as the parent set, the space could well have been used to incorporate more spectra. With these changes, the number of spectra could be increased from 3,000 to approximately 4,800 and the significance of the collection as a mini-reference for general purposes would be greatly enhanced. Finally an index on the top margin of each page indicating the compound class, e.g., polycyclic aromatic hydrocarbons, pyridines, carbohydrates, etc. would facilitate use of the book.

In summary, the catalog which contains 3,000 quality spectra of reasonable size provides a very handy reference source for everyone using infrared spectroscopy; the introductory remarks for each section are also of great diagnostic value. However, its utility would be further enhanced if the number of spectra were increased to 5,000 without page increments.

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Major Medicinal Plants: Botany, Culture and Uses, JULIA F. MORTON, Morton Collectanea, University of Miami. Charles C. Thomas, 301-327 East Lawrence Avenue, Springfield, IL 62717. xix+431 pp. 17.5 x 25.5 cm. \$57.00.

This is an interesting book. Disclaimers in both parts of the "Forward" and also in the "Introduction" emphasize that it is not intended to supplant textbooks of pharmacognosy but rather to supplement them. As such, it provides in 431 well-printed pages more or less detailed information on the botany, distribution, constituents, cultivation, uses, and toxicity of some 58 major medicinal plants plus abbreviated coverage in tabular form of well over 100 plants of lesser significance. Illustrations of the "major" group are numerous and generally well done, although at least one of the 16 colored illustrations (No. 4—*Papaver brachteatum*) is not. Leaves of the great scarlet poppy are not pink.

Nomenclature, which is important in a work of this sort, is generally good. The author citation for *Claviceps purpurea* (p. 5) omits (Fr.), which would properly indicate that Fries assigned the species epithet, but that is a minor point. I particularly like the use of a common family name, in addition to the correct botanical one, because that is helpful to readers with little botanical knowledge. But the arrangement of the drugs by family rather than a simple alphabetic listing implies a sophistication on the part of most readers, even persons well educated by modern standards, which is not realistic. Selection of Prickly Juniper, Marsh Mallow, and Thyme, for example, as "major" medicinal plants might be debated.

In a book containing as much information as this one there are bound to be some statements which are questionable. Generally, Dr. Morton seems to cover the botanical aspects more authoritatively than the chemistry and pharmacology. I shall try to demonstrate this by means of a few selected examples. The *United States Pharmacopoeia* in 1890 did not recommend picrotoxin (p. 94) for anything because uses of drugs were not included in that edition. Perhaps the author had in mind the *United States Dispensatory*. The statement that pigs are apparently immune to henbane (p. 305) is taken from a secondary reference dating back to 1861. Most knowledgeable toxicologists would have suggested the rabbit as the animal most resistant to hyoscyamine (atropine). Actually, common animals listed in ascending order of susceptibility are rabbits, cattle, sheep, goats, pigs, horses, cats, dogs, and birds. Lethal doses of digitalin (a nearly meaningless name unless further defined) are listed (p. 316) in g (grams), but the reference cited reveals that the quantities should be expressed in grains (gr).

I applaud Dr. Morton's correct spelling of the genus *Erythroxylum* (p. 177); at the same time, I question her equivocation (p. 243) on "*Rauwolfia* (or *Rauwolfia*)."
Pharmaceutical usage of the title *Psyllium* includes both blonde (p. 325) and black (p. 331) seed. Why devote two separate monographs to the drug? If emanations from corkwood branches (p. 295) and henbane leaves (p. 305) provoke dizziness and nausea or stupor, it would seem that such an interesting phenomenon could be verified by recent primary references.

Perhaps little fault should be attached to the author for indicating that research in Iran in 1963 (1967?) resulted in the discovery of *Papaver brachteatum* as a potential source of

thebaine (p. 124). Unfortunately, such misinformation is widespread, having been perpetuated in numerous writings, including an erroneous article in *Science* **190**: 1274 (1975). This important discovery was actually made by Neubauer and Mothes and was first published in *Planta Medica* **11**: 387 (1963). The Iranian follow-up study appeared four years later in *Nature* **213**: 1244 (1967).

As I perused the volume, there were a number of minor inaccurate or misleading statements which caught my eye. One example is the implied recommendation of a mixture of pulverized dates, water, butter, and pepper as an antidote for hyoscyamine poisoning (p. 309). Injection of physostigmine would be so much more effective. During my years in the Pacific Northwest, I had always been told that cascara trees were not cultivated because it was economically impossible to guard them adequately to prevent thieves from stripping the bark, rather than because the bark of such trees was of low quality (p. 202).

Dr. Morton's book is still an interesting one for those seeking accurate botanical information on and illustrations of a number of medicinal plants, most of which could be described as "major." With few exceptions (e.g., papaya, pp. 225-228), the sections on cultivation are relatively scanty and not nearly as comprehensive and useful as E. F. Heeger's *Handbuch des Arznei- und Gewürzpflanzenbaues: Drogengewinnung* published in 1956. The paragraphs devoted to chemistry do combine common names with relatively meaningless empirical formulas, but more useful information can be found elsewhere. Discussions of medicinal uses and toxicity are more folkloric-historical than modern-practical. They will need to be read with caution if one intends application. With these caveats in mind, readers will find a great deal of information in the volume. All libraries and individuals with an interest in medicinal plants will want to acquire a copy.

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