Publications

Book Reviews

Microcolumn High-Performance Liquid Chromatography, Journal of Chromatography Library, Vol. 28, edited by Paul Kucera (Elsevier Science Publications Co., 52 Vanderbilt Ave., New York, NY 10017, 1984, 302 pp., $63.50).

The book contains eight chapters: Narrowbore and Microbore Columns by Guichon and Colin; Design of a Microbore Column Liquid Chromatography by Kucera; Theory and Practice of High Speed Microbore HPLC by Hartwick and Dezaro; Special Analytical Techniques by Kucera and Manius; Chemical Derivatization Techniques Using Microcolumns by Kucera and Umagat; Application of Microbore HPLC by Kucera and Hartwick; Liquid Chromatography in Columns of Capillary Dimensions by Novothy, and Micro LC/MS Coupling by Henion.

The pace of development in HPLC has been such that many readers may find it difficult to evaluate the contents of this book from an appropriate perspective. In five years, we have seen a transition from 30 cm × 4-5 mm columns with 10 micron packings to 5 cm × 4.6 mm columns with 5 micron packings and 3 cm × 4.6 mm columns with 3 micron packings. For sample analyses requiring 3000-5000 theoretical plates, these newer columns have provided a 6-10-fold reduction in analysis times and mobile phase consumption. While these short columns make very rapid analyses possible, some apparent loss of efficiency may be seen with some older instruments. During this same period, 25 cm × 4.6 mm columns with 5 micron packings and 15 cm × 4.6 mm columns with 3 micron packings have made possible analyses requiring up to about 20,000 theoretical plates. By reducing the column inside diameter to 2.1 and 1.0 mm, mobile phase savings of 80-95% respectively are realized with no change in analysis time. All of these changes have had the effect of reducing peak volume. A succession of new instruments has been developed providing progressively lower volume detector cells and decreasing extra-column contributions to band broadening. Through a detailed mathematical analysis, Guichon and Colin would appear to conclude (p. 23 and p. 26) that the potential users requiring up to about 20,000 plates will find the 2.1 mm columns the best choice for the next several years, given the capabilities of currently available equipment. They warn that even with these narrowbore as opposed to microbore columns some caution is required to avoid loss of efficiency through extra-column band broadening. Since 70% of the savings in mobile phase solvents obtained with 1 mm columns can be achieved with 2.1 mm columns, they question the economic justification for 1 mm columns.

The caveats expressed in this opening chapter tend to detract from the thrust of the remainder of the chapters. Is this material only of academic interest for the specialist as a cataloging of research programs pointing to the distant future? There seems to be little question that separations requiring very large numbers of theoretical plates will require either serially connected microbore columns or long capillary columns. The constraints such columns will place on instrumental parameters, however, are quite extreme. Given the progress seen in HPLC in the past 5-6 years one would be tempted to conclude that these problems may slow the pace of development, but the pace still will be relatively rapid. The small liquid volumes which are a problem with conventional detectors are a necessity for some of the hyphenated techniques such as LC-MS.

The first chapter alone is clearly worth the price of the book, if it saves the purchase of a single HPLC column. This book is probably most appropriate as a status report for the analytical chemist regularly encountering samples beyond the resolving power of current HPLC techniques.

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CRC Handbook of Chromatography, Lipids, Vol. I and II, edited by Helmut Mangold, Series Editors, G. Zweig and J. Sherma, (CRC Press, Boca Raton, Florida, 1984, pp. 601 and 351, $78 and $58).

These volumes follow the general format characteristics of the series. A typical chapter is perhaps 25% text and 75% tabular chromatographic data. Bob Ackman, however, managed to follow 9 pages of text with 137 pages of tables. The 16 chapters in Volume I include an introduction (Lundberg), extraction and hydrolysis (Christie), fractionation of complex lipid mixtures (Streibl and Janak), alcohols, aldehydes and ketones (Mahadevan and Ackman), straight chain fatty acids (Ackman), branched chain fatty acids (Lie Ken Jie), hydroxy-, epoxy- and keto acids (Viogue), cutins and suberins (Holloway), surface lipids of plants and animals (Holloway), glycerides (Kuksis), phospholipids (Dawson) and glyceroglycolipids (Fischer). The 13 chapters in Volume II include: Sphingoglycolipids and sphingophospholipids (Suzuki and Yamakawa), sphingolipid bases (Huang), prostaglandins and thromboxanes (Fitzpatrick), leukotrienes (Taylor and Morris), prenyl lipids (Lichtenthaler), ozonides and products of ozonolysis (Privett and Nickell), non-volatile oxidation products (Pokorny), antioxidants (Pokorny), fatty acids labeled with deuterium (Patton and Lowenstein), radioactively labeled lipids (Mukherjee), plasma lipoproteins (Assmann and Kladetzky), nitrogen derivatives of fatty acid (Metcalfe et al.), spray reagents (Viogue) and preparation of reference compounds (Mangold and Muramatsu). There also is a brief listing of commercial suppliers.

With so many tables it is extremely difficult to conduct representative random spot checks of accuracy. The compilers, however, are well known and the chapters appear to be both authoritative and comprehensive. As a fan of Holman's Omega System for designation of fatty acid double bond families, it was amusing to note that the chapter of nomenclature appears to give a somewhat garbled explanation (p. 19) of the n-x system. Literature coverage is complete to about 1978. This massive tabulation of useful data is a must for any library used by lipid chemists and biochemists. Recommendations regarding personal purchases must be qualified in terms of currency.

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Lipases, edited by B. Borgstrom and H.L. Brockman, (Elsevier Science Publishers, 52 Vanderbilt Ave., New York, NY, 10017, 1984, 544 pp., $136.25).

Publications

The editors, well known investigators in the field of lipases, have prepared a welcome update on these enzymes. Coverage is limited to well studied lipases which primarily hydrolyze acylglycerols, cholesteryl esters and wax esters. Phospholipase A_2 and many miscellaneous lipases are omitted. The book contains chapters on: General Features of Lipolysis, Brockman; Lingual Lipase, M. Hamosh; Pancreatic Lipase, Verger; Pancreatic Colipase, Borgstrom and Erlanson-Albertsson; Pancreatic Carboxyl Ester Lipase (Cholesterol Esterase), Rudd and Brockman; Lipases in Milk, Olivecrona and Bengtsson; Lipoprotein Lipase, Smith and Pownall; Hepatic Endothelial Lipase, Kinnunen; Lysosomal Acid Lipase, Fowler and Brown; Adipose Tissue Lipases, Belfrage, Frederickson, Stralfores and Tornquist; Plant Lipases, Huang; Fungal Lipase, Iwai and Tsujisaka, and Cutinase from Fungi and Pollen, Kollattukudy and Bacterial Lipases, Sugiura.

In general, the chapters are comprehensive and well written with sections on the physiological aspects. There are some lapses. Discussions of specificity are lacking with some of the enzymes. For example, the extraordinary specificity of *Geotrichum Candidum* lipase for oleic and linoleic acids is mentioned only in passing, and *Candida cylindracea* is not discussed. The chapter on fungal lipase is limited mostly to the work of the authors, and the chapter on bacterial lipases could have been longer. These are minor criticisms and do not detract from the value of the book. It brings the reader up to date from 1974 when the first book on the subject, Lipolytic Enzymes, was published.

As a co-author with H. Brockerhoff of **Lipolytic Enzymes**, I cannot resist pointing out that the cost of our book was $24.50 as compared to the $136.25 for the one I have reviewed. Is **Lipases** worth the cost? My answer is yes. All who are interested in these fascinating enzymes will need to refer to the book.

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New Publications

Rodd's Chemistry of Carbon Compounds, edited by M.F. Ansell, Elsevier Science Publishing Co., PO Box 1663, Grand Central Station, New York, NY, 10163, 1984, 560 pp., $146.25.

Technology and Product-Mix Forecast—Oils and Fats in 2000 A.D., (based on the proceedings of the 29th Annual Convention of the Oil Technologists' Association of India, Dec. 1983), edited by V.V.S. Mani and V.V.R. Subrahmanyan, Oil Technologists' Association of India, Western Zones, PO Box 9981, Bandra(West), Bombay - 400 050, India, 1984, 82 pp., $10.

The Practice of Frying, PORIM Technology Series no. 9, by Kurt G. Berger, Palm Oil Research Institute of Malaysia, PO Box 10620, Kuala Lumpur, Malaysia, 1984, 34 pp., Malaysian $2.50. Also **Hydrogenation**, PORIM Technology no. 10, by M.S.A. Kheiri, PORIM, 1984, 52 pp., Malaysian $2.50. And **Citric Acid in the Processing of Oils and Fats**, PORIM Technology no. 11, by K.S. Law and K.G. Berger, PORIM, 1984, 32 pp., Malaysian $2.50.

Microcolumn High-Performance Liquid Chromatography, edited by P. Kucera, Elsevier Science Publishers, PO Box 1663, Grand Central Station, New York, NY 10158, 1984, 18 pp., $63.50.

Current Topics in Nutrition and Disease, Vol. 10., Malnutrition: Determinants and Consequences (Proceedings), Alan R. Liss Inc., 150 5th Avenue, New York, NY, 10011, 1984, 512 pp., $96.

Practical Aspects of Gas Chromatography, Mass Spectrometry, by G.M. Message, John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158, 1984, 464 pp., $50.

Nutrition, Hypertension and Cardiovascular Disease, by Ronald S. Smith, Lyncean Press, 885 8th Street, Gilroy, CA 95020, 1984, 210 pp., $12.95.

New Products

VACUUM GAUGE

CVC Products has introduced a portable vacuum gauge for measuring pressures in the 1 to 5000 millitorr range. The battery-operated GTC-365 vacuum gauge is housed in a lightweight aluminum case. A battery charging kit is available as an option. The gauge can be operated while recharging. A CVC type GTC-036 thermocouple vacuum sensor comes with the gauge for measurements in the 1 to 5000 millitorr range. A CVC type GTC-004 sensor for readings in the 10 to 1000 millitorr range is available. Contact: CVC Products Inc., PO Box 1886, Rochester, NY 14603.

C18 COLUMN

Burdick & Jackson Laboratories has developed a new C18 column, called the OD5 LC column, for reverse phase liquid chromatography. The column support is spherical 5-micron bonded C18 silica particles which are end-capped and packed into a precision polished tube. The column comes in two lengths: 25 cm for critical separations and 15 cm for routine separations. Finger tight fittings to withstand pressures up to 4,000 psi are provided with each column. Contact: Pat Krieger, Burdick & Jackson Laboratories, 1953 S. Harvey St., Muskegon, MI 49442.

NMR NETWORK

Varian's magNet NMR network technology allows laboratories to run experiments simultaneously with data analysis. With the equipment, one operator can structure files, manage data or write programs and new pulse sequences remotely on the data station while another researcher conducts new NMR experiments. The technology is designed to offer a data transfer rate of 100 Kbytes per second or 800 Kbaud. Contact: Varian Associates, Instrument Group, 220 Humboldt Ct., Sunnyvale, CA 94086.