

Analytical Q&A

(The following column is based on questions sent to AOCS' technical director. If you have a question concerning analytical methodology of fats and oils or related products, please send your question to: AOCS Technical Director, 508 S. Sixth St., Champaign, IL 61820.)

Q. Is there an official AOCS method to determine if sunflowerseed oil has been dewaxed?

The cold test, Method Cc 11-53(73), is the only official method that might be applicable. This method is used for all animal and vegetable oils. A rapid test for wax in sunflower oil, based on nephelometry, was reported in *JAOCS* 56:857 (1979). The nephelometric procedures cover a range of 10 to 200 ppm wax.

Q. Do high erucic acid oils (rapeseed, crambe) that cannot be used as a source of edible oils have any commercial value?

The high erucic oils do have industrial applications, although these may have not been fully exploited yet. Erucic acid oils and derivatives have potential uses as lubricants in steel castings, formulated lubricants, rubber additives, corrosion inhibitors and plasti-

cizers. See *JAOCS* 48:723 (1971).

Q. May polyethylene be used for the packaging of edible oils?

Polyethylene may be used for the packaging of edible oils provided it meets the specifications noted in CFR 177.1520 for olefin polymers. A ruling on the use of proposed packaging material may be obtained by contacting FDA, Indirect Additive Branch, Division of Food and Color Additives—HFS335, 200 C St. SW, Washington, DC 20204 (telephone 202-472-5680). High density polyethylene is currently being used for packaging cooking oils.

Q. Is there an equation for estimating either the volume change or specific gravity change in vegetable oils during heating?

For vegetable oils, the density exhibits almost a linear change in the temperature range of 40 C to 260 C.

Within this range, the density of the oil will decrease by 0.00064 for each degree centigrade increase in temperature. The change is greater at lower temperatures. In the range of 0 C to 40 C, the decrease is 0.00069 for each degree centigrade. These factors do not apply to hydrogenated oils, lard or other fats. For additional information, see *Bailey's Industrial Oil and Fat Products*, Vol. 1, 4th edition, pp. 186-191.

Q. What is a foots test and where can the method be found?

The foots test is used to give an approximation of the percentage of gums (or "foots") in oils. The gums are mainly phospholipids. The test that is suitable for determining gums in linseed oils (*JAOCS* 27:545 [1950]) can, with some modifications, be used in crude vegetable oils (*JAOCS* 28:393 [1951]).

Q. What are cycloartenol and citrostadienol and where are they found?

These compounds are plant sterols. Cyclostenol is a triterpene alcohol and citrostadienol is a 4-methylsterol. Both of these sterols have been isolated from 19 vegetable oils. See *JAOCS* 50:122, 50:300 (1973).

Publications

Book reviews

Opportunities in Chemistry 1985, Committee to Survey Opportunities in the Chemical Sciences (National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418, 1985, 344 pp., \$18.50 US, Canada and Mexico; \$22.50 elsewhere).

This survey is a new version of the Westheimer publication with a similar title, and is a new survey of chemical science and its intellectual and economic impacts. The book is divided into chapters concerning control of chemical reactions, molecular complexity,

chemistry and national well-being, manpower and education, and resources for basic research in the chemical sciences. Two appendices cover the areas of chemistry in industry and contributors. The report draws conclusions and makes recommendations concerning the state of chemistry in our nation today. It also states several priorities which should be given to various areas of chemical research. The section concerned with "resources for basic research in the chemical sciences" stresses a well-known point—that basic research and education cannot continue to advance without continued funding to purchase state-of-the-art equipment, and that this funding

must come from federal agencies. Although this report focuses on the discipline of chemistry, the reader should recognize that many other disciplines beyond chemical sciences also use the chemical sciences and face the same dilemma. The book is interesting reading for the person with a background in chemistry. It would be useful to the advanced undergraduate as an indication of potential career opportunities, although the primary audience is those responsible for guiding science policy in the United States.

E. G. Perkins

Publications

Synthetic Reagents, Vol. 6, edited by J. S. Pizey (Ellis Horwood Ltd., Chichester, England, and John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158, 1985, 438 pp., \$89.50.)

This book is part of a continuing series. Three reagents are reviewed in depth in order to provide a full understanding of their utility. In this volume, the three reagents reviewed are chloramine-T, hydrogen peroxide and polyphosphoric acid. Each section has its own table of contents, which indicates the major functionalities and compounds which undergo reaction with the reagent. Each section appears to be lavishly illustrated with structures and reaction schemes as well as with an extensive reference list. The chapter on polyphosphoric acid contains 1117 citations. The book also contains an extensive index which is categorized according to both chemical name and chemical reaction. This book would be very useful as a resource for the practicing organic chemist who wishes to quickly check the applicability of a particular reagent for organic synthesis.

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The Role of Fats in Human Nutrition, edited by F.B. Padley and F. Podmore, in collaboration with J.P. Brun, R. Burt and B.W. Nicols (VCH Publishers, 303 NW 12th Ave., Deerfield Beach, FL 33442, 1985, 210 pp., \$41).

The title of this book is identical to that of a 494-page book edited by A.J. Vergroesen and published by Academic Press in 1975. Unlike the older book, in which human lipid nutrition received a comprehensive treatment from as broad a base as was then possible, this newer book deals with 15 specific topics, hence 15 chapters. They range from dietary trends in Britain (first chapter) and the interpretation of dietary recommendations relating specifically to the British scene (last chapter) to current controversial issues in the international field. Foreign readers familiar with the

writings of some of the investigators may find few surprises and perhaps not all of the references that they might expect to see in this book. The treatments given some specific oils and fatty acids should be considered as views of the authors rather than reviews of scientific progress. The book is, however, eminently readable and provocative.

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Handbook of Reactive Chemical Hazards, 3rd Edition, by L. Bretheric (Butterworth Publishers, 80 Montvale Ave., Stoneham, MA 02180, 1985, 1852 pp., \$99.95).

Implementation of the OSHA Hazard Communication Standard (November 1985) and the requirement therein for training programs (May 1986) has led to a proliferation of new books and new editions of old books on chemical hazards. This particular handbook, first published in 1975, has been revised to provide data on 4900 compounds, according to the author, and 9000 compounds, according to the publishers. Coverage of 4900 compounds in 1400 pages, however, results in many compounds being cross-referenced to discussion by class, i.e., haloalkanes, diazonium sulfates or halo-silanes. Emphasis is on reactive chemicals and circumstances or interactions causing fires or explosions. This theme is reiterated in the appendices, which list structures associated with explosive instability, low flash points and relatively low auto-ignition temperatures.

In a handbook of this type, the mode of organization and quality of the indices and appendices are of critical importance. The user may frequently be faced with the problem of expeditiously locating the information for a specified listed compound or the class characteristics of an unlisted compound. Bretheric appears to have made a particular effort to make it as easy as possible for the user to access information. This book can be recommended to anyone concerned

with laboratory safety. Unfortunately, such information is all too frequently omitted from the average laboratory course and university education.

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CORD issue

The Asia and Pacific Coconut Community has recently published the second issue of its biannual publication, *CORD, Coconut Research and Development*. *CORD* is devoted to research and development activities in the coconut industry. Subscription rates per copy are \$7.50 for Asia and the Pacific and \$10 for the U.S. and Europe. Contact: Asian & Pacific Coconut Community, PO Box 343, Jakarta, Indonesia.

New books

From Marcel Dekker Inc., 270 Madison Ave., New York, NY 10016:

Principles of Colloid and Surface Chemistry, 2nd edition, by Paul C. Hiemenz, 1986, 840 pp., \$39.75 (U.S. and Canada), \$47.50 (other).

Handbook of Polycyclic Aromatic Hydrocarbons, Vol. 2: Emissions Sources and Recent Progress in Analytical Chemistry, ed. by Alf Bjorseth and Thomas Randall, 1985, 432 pp., \$95 (U.S. and Canada), \$114 (other).

From John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158:

The Manufacture of Soaps, Other Detergents and Glycerine, by Edgar Woollatt, 1985, 473 pp.
Industrial Adhesion Problems, ed. by D.M. Brewis and D. Briggs, 1985, 298 pp.

The Cotton Gazetteer, by Arlen W. Frank. Reference book on cotton

Publications

growing and manufacturing, organized by country, from Afghanistan to Zimbabwe. Publication June 1986, hardcover, 206 pp., \$19.75, Arlen W. Frank, 3812 Croydon St., Slidell, LA

70458.

CSMA Detergents Division Test Methods Compendium, 2nd Edition, Chemical Specialties Manufacturers Association (CSMA)

Publication Sales, 1001 Connecticut Ave., NW, Suite 1120, Washington, DC 20036, 1985. 120 pp., \$45 CSMA members, \$54 nonmembers.

New Products

FLUORESCENCE DETECTOR

A programmable fluorescence detector from Hewlett-Packard Co. provides a range of detection options for liquid chromatographers working on environmental, food, pharmaceutical and pathological samples. Time programming allows the HP 1046A to optimize selectivity and sensitivity by automatically switching excitations and emission wavelengths for each peak. It can be used as a phosphorescence or chemiluminescence detector and is compatible with any HPLC. Contact: Inquiries Manager, Hewlett-Packard Company, 1820 Embarcadero Rd., Palo Alto, CA 94303.



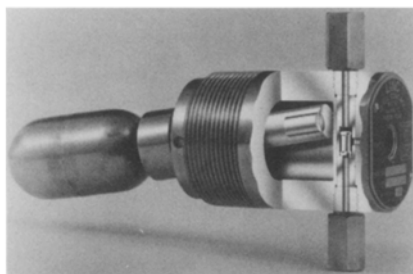
GAS PACK CYLINDERS

Andonian Cryogenics Inc. has available cryogenic gas-pack cylinders which can be used in pairs with an automatic changeover manifold to supply a continuous supply of gas equivalent to 48 high-pressure compressed gas cylinders. Additional gas packs can increase the system's capacity to the equivalent of 196 high-pressure gas cylinders. Contact: Andonian Cryogenics Inc., 26 Farwell St., Newtonville, MA 02160.

pH METER

Whatman LabSales Inc. has introduced a stick pH meter featuring

± 0.01 pH accuracy, two-point calibration and automatic temperature compensation. No additional temperature probe is required; it has an optional submersion assembly and a variety of pH electrodes. Contact: Whatman LabSales Inc., 5285 N.E. Elam Young Parkway, Suite A-400, Hillsboro, OR 97124.



LIQUID LEVEL SWITCHES

Granzow Inc. has announced a line of liquid level switches with a cylindrical float of stainless steel, titanium, plastic or synthetic material in a communicating bypass tube. The float contains a permanent magnet, and a magnetic level indicator is fitted to the outside of the bypass tube. Contact: Granzow Inc., 6033 Kenley Ln., Charlotte, NC 28210.

SPECTROMETER

Applied Research Laboratories Inc. has available a bench-top spectrometer designed for the smaller lab. The ARL 3410 ICP with Minitorch reportedly consumes 30-40% less argon and power than ICP counterparts. Contact: Eric Mower and Assoc., 101 S. Salina St., Syracuse, NY 13202.

LEVEL CONTROL TESTERS

The 282-21 from Linc Manufacturing allows an operator to test pneumatic level controls without removing them from service. With an external knob, the operator can press a button and move the float manually, testing pneumatic and mechanical parts. Made of stainless steel, the level control has a standard working pressure rating of 1,500 PSI and can operate in liquids with specific gravities as low as 0.5. Contact: Linc Manufacturing, P.O. Drawer 788, Porter, TX 77365.

TITRATOR

Brinkmann Instruments Co. has introduced its Metrohm 682 titrator designed to control up to four titrating burettes automatically with up to 40 stored programs. A single button runs any sequence of stored programs from the 682's library of 40 individual or linked procedures. Contact: Brinkmann Instruments Co., Cantiague Rd., Westbury, NY 11590.

LIQUID SEPARATOR

Action Engineering's Hi-Rise liquid/liquid separator system uses the principle that immiscible mixed fluids, when slowed from turbulent to laminar flow, will separate and rise in proportion to their specific gravities in their respective chambers when separated by an inclined plane. Uses include wastewater treatment, soluble coolant cleansing, industrial and toxic waste cleanup, tramp oil removal from water, and soluble coolants. The system has no movable parts and can accept oil mixtures and variable oil concentrations. Options include multiple inlet flows, sectionalized units for large installations and flow rates to 1000 gallons per minute. Contact: Action Engineering Inc., PO Box 505, Temple City, CA 91780.