Methodology

Methods development update

Alternate solvents
Past recommendations for alternate solvents in the iodine value method (AOCS Official Method Cd 1-25) have included trichloroethane (TCE), 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113), glacial acetic acid alone and a 1:4 mixture of acetic acid/cyclohexane. Based on comments expressed at AOCS technical committee meetings, the use of Freon 113 should not be considered due to environmental concerns.

Several laboratories have made a comparison between TCE and carbon tetrachloride in the iodine value method. The reports from the laboratories show that TCE is most likely not a suitable substitute in the method because TCE consistently gave values that were two iodine value units lower than when carbon tetrachloride was used. Therefore, at this time, comparison studies are concentrating on the use of cyclohexane as an alternate solvent in the iodine value method.

Participants in the Smalley Check Sample Program series on edible fats, NIOP fats & oils and fish oil have been asked, on a volunteer basis, to perform comparison studies between cyclohexane and carbon tetrachloride when analyzing the iodine value of the check samples. To date, favorable results have been reported except for fish oil (high iodine value) and emulsified shortenings. One laboratory is undertaking a study to determine the problem with emulsified shortenings.

From a safety and environmental point of view, the use of cyclohexane appears to be worth serious consideration. The *Chemical Regulation Reporter*, No. 30, Vol 11 (Oct. 23, 1987), notes that "cyclohexane (CAS No.110-82-7) has been produced and used in industry for 40 years with no identified health hazards. The industry group members also presented results of three surveys on occupational exposure to the chemical, and claimed there is no significant consumer exposure to it."

The use of cyclohexane as an alternate solvent to carbon tetrachloride in the iodine value method has been proposed as a Recommended Practice in the *1987 Additions and Revisions to Methods*. This method will appear as AOCS Recommended Practice Cd 1b-25.

Smalley Check Sample Program
At the AOCS Governing Board meeting in November 1987, the Technical Activities Coordinating Committee recommended that the scope of the Smalley Check Sample Program be expanded to allow collaborative studies for the validation of new methodology and continued validation of existing AOCS methods. This recommendation was approved by the Governing Board.

The first project to be undertaken concerns the validation of the copper sulfate catalyzed TKN method vs. the presently used mercuric oxide catalyzed method. While the copper sulfate method has been studied collaboratively among 15 laboratories (*JAOCS 64*: 511 [1987]), there is not sufficient data to permit a decision about which is *the* official method that should be used for referee analysis. At this time, the plan is to incorporate the collaborative study of the two TKN methods (copper sulfate vs. mercuric oxide) into the Smalley Check Sample Program for the 1988-1989 year. The copper sulfate method has been adopted as an official AOCS method and will appear in the *1987 Additions and Revisions* as Method Ba 4b-87.

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Publications

Book reviews

Chromatography of Lipids in Biomedical Research and Clinical Diagnosis (Journal of Chromatography Library, 37), edited by Arnis Kuksis (Elsevier Science Publishing Co. Inc., PO Box 1663, Grand Central Station, New York, NY 10163, 1987, 460 pp., $97.75).

This book is divided into 13 major chapters; each of these is further subdivided into sections discussing specific topics concerning lipid chromatography. Topics covered are general strategies for practical chromatographic analysis of lipids, polar capillary chromatography of intact natural diacyl and triacylglycerols, HPLC of arachidonic acid metabolites involved in inflammation, application of GC-MS techniques to the analysis of prostaglandins and related substances, GLC of plasma intact lipids in clinical research, HPLC of the arachidonyl molecular species of glycerophospholipids in alveolar macrophages and immune responses, HPLC of diacylglycerol and phospholipase C-sensitive glycerolipids in microsomes of normal tissues and dystrophic muscle, chromatographic analysis of phosphoinositides and their breakdown products in activated blood platelets/neutrophils, TLC and HPTLC of phospholipids and glycolipids in health and disease, HPLC of molecular species of glycero-containing phospholipids in studies of lipoproteins and lipid transport, HPLC of glycosphingolipids in brain disease, GC-MS of molecular species of glycerophospholipids and LC-MS of natural glycerolipids.

The above listing is but a fraction of the information presented in this book. Much more detailed information can be found in the many subsections. This book contains a wealth of information of

value to both the biomedical-biochemical as well as the analytical chemical-oriented lipid chemist. Any chemist involved in lipid analysis using any type of chromatography will find the information in this book beneficial. In many ways, the book also is a laboratory handbook because many discussions of technique are of sufficient detail to be very helpful. The index is quite detailed, and the figures used are of good quality. This book is highly recommended to any chemist interested in the application of the newer analytical techniques to lipid analysis.

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Thin Layer Chromatography, by Richard Hamilton and Sheila Hamilton (published for Analytical Chemistry by Open Learning by John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158, 1987, 129 pp., $19.95).

The United Kingdom concept of the "Open University" was developed in a compact country with a centralized and uniform educational system. It has no exact parallel in North America, but the concept of "Analytical Chemistry by Open Learning" has some parallels in North America in certification of chemists who can pass examinations set by various chemical societies such as the American Chemical Society or the Chemical Institute of Canada. This slim volume is directed toward ambitious readers with some chemical education.

Thanks to the basic simplicity of thin layer chromatography, simultaneous access to equipment is unnecessary, and this course successfully devotes itself to materials and operations. The dialogue format, with some questions and immediate answers interspersed with instruction passages, is a refreshing alternative to the more common system of saving all of the questions for the end of the section or chapter. The continued popularity of thin layer chromatography for qualitative and small-scale preparative separations suggests that this book should be available in fats and oils laboratories to assist new technical staff to better understand what they may be asked to do. Also, several copies should be available in any university library for use as a teaching aid.

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Basic Biotechnology, edited by John Bu'Lock and Bjorn Kristiansen (Academic Press, 6277 Sea Harbor Dr., Orlando, FL 32821-9989, 1987, 561 pp., $29.95 paperback, $85.50 casebound).

This is a well-conceived book by the editors, whose goal was to convey a working knowledge of biotechnology to those who are not practicing biotechnologists or students in this area of science. To accomplish this goal, the editors have brought together 26 authors to provide 21 chapters of information. Generally, the book is divided into two major parts: "Fundamentals and Principles" and "Practical Applications."

"Fundamentals and Principles" are covered in nine chapters beginning with an introduction to biotechnology by John Bu'Lock. This section then proceeds with chapters covering the areas of science most widely utilized in biotechnology: biochemistry of growth and metabolism; thermodynamics of growth; microbial process kinetics; transport phenomena and bioreactor design; downstream processing in biotechnology; sterilization and sterility; microbial screening, selection and strain improvement; and instrumentation. Each chapter gives a concise but adequate description of the process involved. These are only adequate in the sense that they inform the reader of information needed for grasping the concepts but lack the detail needed for actual design of a biotechnology-oriented project or process.

Once the reader has become familiarized with the basic tenets of biotechnology, the second part of the book provides 12 examples of areas where biotechnology has been or will be applied, aptly named "Practical Applications." In these 12 examples, almost every major field has been covered, from the production of cell biomass for single-cell protein to the use of cultured animal and plant cells for antibodies and exotic natural compounds. The authors of these chapters do an excellent job of describing their processes from the advantages of particular process designs to pitfalls that can accompany any biotechnology project.

This book accomplishes its goal as an informational base for those who are unfamiliar with biotechnology and would be recommended to those in such a situation.

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New books

La régulation de la lipogenèse et de la lipolyse chez les mammifères, by Ph. Guesnet and Y. Demarne, Institut National de la Recherche Agronomique, Service des Publications, C.N.R.A., route de Saint-Cyr, 78000 Versailles, France, 1987, 160 pp., 85 French francs, in French.

A new report, **Nutrition Labelling: An International View**, examining nutritional labeling in the EEC countries, Scandinavia, New Zealand, North America and Australia has been drawn up by Ann Freckleton of the Food Policy Research Unit at the University of Bradford. The report is available for £25 from the Food Policy Research Unite, University of Bradford, Bradford, West Yorkshire, UK.

The 6th Edition of **Handbook of Organic Industrial Solvents** is available from the Alliance of American Insurers' Loss Control Department. Copies are $6 for Alliance members, $10 for nonmembers, by writing to the Alliance of American Insurers, Order Dep't., 1501 Woodfield Rd., Schaumburg, IL 60173-4980.