Work continues on alternate solvents

Efforts are still under way to find safe alternate solvents to carbon tetrachloride in the iodine value (IV) method and to chloroform in the peroxide value (PV) method. At this time, the most viable alternative to carbon tetrachloride in the IV method appears to be cyclohexane, although there is concern about using cyclohexane when the IV exceeds 100–120. Possibly a longer reaction time is required. An IV method using cyclohexane was adopted as AOCS Recommended Practice Cd 1b-87 in 1987. The results of a cyclohexane study were reported in the May 1988 issue of *JAOCS*.

At the suggestion of AOCS member Gerhard Maerker of the U.S. Department of Agriculture's Eastern Regional Research Center, isooctane has been tried as an alternate solvent in the PV method. David Books of the Oil-Dri Corp. in Chicago has reported success using isooctane in the PV method for determining the PV of soybean oil. Isooctane is substituted directly for chloroform in the PV method, with no change in the ratio of solvent to acetic acid.

There is a problem with dispersing the saturated potassium iodide solution when using the isooctane/acetic acid solvent mixture. However, this can be overcome either by using 30 ml of the acetic acid/isooctane solvent mixture and increasing the reaction time from one minute to three minutes or by increasing the volume of the acetic acid/isooctane solvent mixture from 30 ml to 50 ml while keeping the reaction time at one minute.

Brooks currently is testing the isooctane/acetic acid solvent mixture for the determination of PV of other oils and fats. He plans to give a poster presentation on his work at the AOCS meeting in Cincinnati in May.

Meanwhile, Scott Lofquist of Continental Commodities Corp., Vernon, California, has reported that attempts to substitute either glacial acetic acid alone or a cyclohexane/acetic acid mixture were unsuccessful. Lofquist has provided documentation that a 3:2 mixture of glacial acetic acid/1,1,1-trichloroethane (TCE) also is a satisfactory alternative to the standard acetic acid/chloroform mixture. Lofquist has tested a variety of fats and oils, with PV ranging from slightly less than 1.0 to about 110.

If possible, a comparison study of these two solvent systems will be arranged through the Smalley Check Sample Program for 1989-1990.

New methods edition

Compilation of the 4th edition of the AOCS methods book is basically on schedule. The complete book of methods is now stored on computer disk to facilitate editing and updating. A functioning review system is in place, using associate methods editors, a concept proposed by David Firestone. As of Feb. 1, 1989, sections Aa, Ab, J, M, S and T, representing 101 methods out of 360, had been reviewed, amended as necessary and reapproved for 1989. Review of the remaining sections of methods is in progress and is expected to be completed by the time of the Cincinnati meeting.

Updated methods and additions and revisions, including any new methods, will be incorporated in the 4th edition during 1989. The anticipated publication date will be Dec. 15, 1989. Publication price will be $300.

Cargo contaminants

E. Wayne Emmons of SGS Control Services is developing new methods for detecting trace contaminants in cargo tanker shipments of fats and oils. Methods for the analysis of benzene, xylenes and

styrene monomers were reported previously (July 1988 issue of *JAOCS*). Emmons has completed the development of methods for the analysis of acrylonitrile, acetophenone, phenol, vinyl acetate monomer, dioctyl phthalate, ethyl acrylate and methyl methacrylate.

These methods use co-distillation, HPLC and diode-array detection. Copies of the abridged versions of the methods are available by contacting Emmons or the AOCS technical director.

Official supplies

Effective Feb. 10, 1989, the AOCS has discontinued the sale of diatomaceous earth. AOCS continues to offer standard bleaching clay, refining cups and standard nickel catalyst. Recently, a request was received for a standard AOCS bleaching cup. Possibly this was an item offered by the AOCS at some time. If anyone has any information on the existence of an AOCS official bleaching cup or if such cups were actually supplied by AOCS at one time, please contact the AOCS technical director.

These articles concerning methodology were prepared by AOCS Technical Director Dave Berner, who is based at AOCS headquarters, PO Box 3489, Champaign, IL 61826-3489, USA.