

# 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.

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