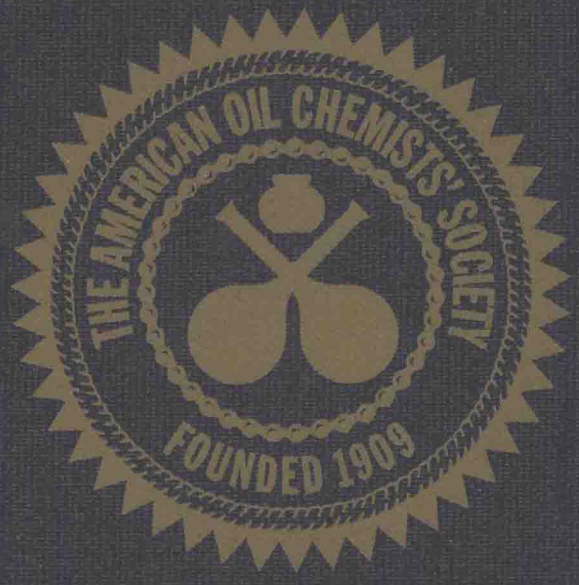
Official Methods and Recommended Practices of the AOCS

6TH EDITION
2ND PRINTING



Celebrating 100 Years of Analytical Excellence

OFFICIAL METHODS
AND
RECOMMENDED PRACTICES
OF THE
AOCS

Sixth Edition

LAB SAFETY

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PREFACE

The Sixth Edition of the *Official Methods and Recommended Practices* continues with a more accessible look. New, easier-to-read typefaces and updated typography have been used while maintaining the stand-alone nature of the methods. As with the earlier editions, this reprinting emphasizes modern techniques and recent advances in analytical chemistry using up-to-date instrumentation. The edition contains more than 430 methods. Thanks are due to the associate editors and the AOCS Technical Department staff. Special thanks are due to Dr. Richard Cantrill, AOCS technical director, for his leadership and technical assistance in editing this edition.

Dr. David Firestone
Editor of Analytical Methods
January 2012

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Explanation of Method Numbers

Each section of methods applying to a specific type of product is designated by a capital letter. Small letters are introduced where sections are divided into subsections. The first numeral indicates a specific method or test. When more than one such method or test is available, small letters again represent the subdivision. The two numerals following the dash represent the year of initial adoption. The numerals in parentheses indicate the year of the latest issue of the method. Methods are reissued when they are revised, corrected, reapproved or become official.

The heading of the method designates whether the method is official, a recommended practice or a standard procedure.

Surplus Methods

Method numbers followed by an asterisk (*) have been placed in surplus status by vote of the Uniform Methods Committee and will not be printed in future issues of this manual. They will be listed in the index for reference purposes only. Individual copies of these methods can be obtained upon request to the offices of the Society.

Methods Used in International Trade of Oils and Fats R 5-09

This list provides a cross-reference between AOCS methods and those required for use when trading under FOSFA International contracts. This list was previously published in Section R.

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Sampling and Analysis of Vegetable Oil Source Materials

Section A

These methods are suitable for sampling and analysis of vegetable oil source materials, including cottonseed, soybean, peanuts, sunflower, corn and rapeseed, as indicated within the scope of each method. They provide procedures for the commercial evaluation of these materials and for the determination of constituents found important in trading. These methods are based on extensive experience, committee investigation and collaborative work.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Sampling and Analysis of Oilseed By-Products

Section B

These methods are suitable for sampling and analysis of cottonseed linters and hull fiber, and cake, meal and meats from cottonseed, soybeans and peanuts, as indicated within the scope of each method. They provide procedures for evaluating these products on a commercial or trading basis. These methods are based on extensive experience, committee investigation and collaborative work.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Commercial Fats and Oils

Section C

The methods in this section are suitable for the analysis of fats and oils of animal, vegetable and marine origin within the scope indicated for each method. The natural fats and oils consist primarily of triglyceryl esters, usually referred to as triglycerides or triglyceride oils, thereby distinguishing them from waxes and petroleum oils and greases. These methods are equally applicable to partial esters of glycerol and the glycols. It is conventional to refer to "fats" as those triglycerides that are solid or semisolid at room temperature, and to "oils" as those that are liquid under the same conditions. These methods have not been developed with special reference to waxes such as beeswax, carnauba wax, wool wax, etc., but many of these methods may be applicable to these substances.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Sampling and Analysis of Soap and Synthetic Detergents

Section D

These methods are suitable for sampling and chemical analysis of normal soap and soap products, soaps containing synthetic detergents, fatty alkyl sulfates and alkyl benzene sulfonates. These methods are applicable to these products in their various physical forms, such as cake, powdered, flake, liquid and paste soaps. They provide procedures for the commercial evaluation of these materials and for the determination of constituents to establish conformance to specifications involved in commercial transactions. The calculations used in the methods in this section yield constituent percentages that are in "weight percent."

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Sampling and Analysis of Glycerin

Section E

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Analysis of Sulfonated and Sulfated Oils

Section F

These methods are applicable to the analysis of surface active agents of the sulfuric acid ester (sulfate) and sulfonic acid (sulfonate) types. In the former, there is an oxygen bridge between the sulfur and the carbon atoms whereas in the latter the sulfur is bound directly to the carbon atom. The sulfuric acid ester or sulfate type is distinguished from the true sulfonate type by the fact that it is hydrolyzed upon boiling with mineral acids to yield free sulfuric acid.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Sampling and Analysis of Soapstock

Section G

These methods are applicable, within the scope indicated with each method, to the sampling and analysis of soap stock obtained from the refining of fats and oils of animal, vegetable and marine origin. These methods have been developed through extensive collaborative work. While these methods are provided primarily for the commercial evaluation of soap stock for trading purposes, they are equally well suited to quality control or research analysis.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Specifications
for
Reagents, Solvents, and Apparatus

Section H

WARNING

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Analysis of Lecithin

Section J

The methods for the analysis of lecithin are applicable to lecithin of vegetable origin. No investigation has been made of the suitability of the methods to the analysis of lecithin products of animal origin, although many of them may apply. These methods have had considerable use in industry and have also been carefully checked by collaborative work, committee investigation and committee review. They are provided in order to furnish a uniform and standard basis for the commercial evaluation and trade of lecithin.

WARNING

Some of the methods contained in this section require the use of flammable, toxic, hazardous and/or poisonous materials. Manufacturers' safety instructions and the cautionary statements included in the methods for handling these materials should be observed. Methods requiring the use of hazardous and toxic materials should be carried out in a properly operating fume hood, to prevent exposure of laboratory personnel. Appropriate protective clothing and equipment should be used. See the Laboratory Safety section of this book.

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Evaluation and Design of Test Methods

Section M

Procedures in Section M include:

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Recommended Practices
for
Testing Industrial Oils and Derivatives

Section S

Each type of material is described in a separate method. The applicable analytical methods are listed and the significance of test results discussed.

WARNING

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Test Methods
for
Industrial Oils and Derivatives

Section T

In this section, analytical methods for similar characteristics have been grouped together. Applicability of a procedure to a particular type of sample is indicated in the scope of the method. Information regarding the significance of the test results is discussed in the methods in Section S.

WARNING

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