bubble aeration and the skimming away of the resulting foam will significantly reduce the ABS concentration in the mother liquor. This finding is presently being further investigated under varying conditions of aeration, using waters of different mineral content.

The second problem in connection with ABS in sewage-treatment plant effluents concerns the effect of ABS on aquatic life. This project is maintained at the Philadelphia Academy of Natural Sciences under the direction of John Cairns and Ruth Patrick. Their interest is the determination of the tolerance of aquatic life for alkylbenzenesulfonate. The organisms under test are bluegill fish, snails, and diatoms. This project, too, has been under way for a relatively short period only. Preliminary results indicate that the lethal dose of ABS in both hard and soft water is many times greater than maximum concentration ever recorded in any lakes or streams.

Summary

Several university research programs on the effects of alkylbenzenesulfonate (ABS) and condensed phosphates on water-treatment plants and sewage-treatment plants are reviewed. Methods of analyzing for very small amounts of these materials have been developed. The concentration of condensed phosphates in surface waters was determined, and it was found that even at several times these levels the effect on normal water-treatment procedures is slight. In sewage treatment plants the presence of ABS is only one of the factors in the frothing problem. Ammonia nitrogen, BOD, and temperature are also involved. Most of the ABS entering an activated sludge process is biologically degraded, and it has no toxic effect on sewage bacteria. At the levels found in surface waters ABS does not have a toxic effect on aquatic life.

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Report of the Color Committee, 1957-1958

THE WORK of the Color Committee of the American Oil Chemists' Society during the 1957–58 year has been confined to the revision of Method Cc 13b-45 and to the acquiring of the necessary data for publishing an article on the standardization of Lovibond glasses, which appeared in the March, 1958, issue of the Journal of the American Oil Chemists' Society. The article appearing in the Journal is self-explanatory and resulted from a decision made at the New Orleans meeting in May, 1957. A copy of the revised method for the determination of color follows. The Color Committee recommends the amended procedure to the Uniform Methods Committee for adoption.

A meeting of the committee was held on April 20, 1958, to discuss a program for 1958–59.

R. C. STILLMAN, chairman

Sampling and Analysis of Commercial Fats and Oils
A.O.C.S. Official Method Cc 13b-45
(Corrected Nov. 1947, revised Oct. 1952, revised Nov. 1953, revised Oct. 1955)

COLOR

Wesson Method, Using Lovibond Glasses Calibrated in Accordance with N″ Scale.

Definition: This method determines the color by comparison with glasses of known color characteristics.

Scope: Applicable to all normal fats and oils, providing no turbidity is present in the sample.

A. APPARATUS

1. *Colorimeter.* The instrument consists of a light-proof box with a dull black interior, illuminated by a 100-watt blue frosted Mazda electric light bulb. A block of magnesia 1 x 2¾ x 3¾ in. is placed in the instrument at the proper angle to reflect the light from the electric bulb vertically upward through the color tube and color glasses. Thinner magnesia blocks may be used in combination with a spacer to give the 1-in. total thickness.
   An eye piece finished with a dull black interior is fitted over (outside) the rectangular top of the tube holder so that the light passes through the color tube and color glasses. Eye pieces with split fields are not permitted. The tube holder (1 in. i.d.) is fitted with 13/16 in. i.d. rings at the bottom. One ring is to retain the color tube containing the oil sample, and the other is to permit an equal amount of light to reach the color glasses.
   a. *Wesson Type.* Wesson type of colorimeter, constructed as shown in the illustration.
   b. *Stevenson.* The Stevenson colorimeter conforms to the above specifications for the Wesson Colorimeter and is approved. See Oil and Soap, *13*, 18–20 (1938).
   c. *Lovibond Tintometer, Model 14A.* The Lovibond Tintometer, Model 14A, conforms to these specifications and is approved when operated according to the manufacturer's instructions.
2. *Color Booth.* The colorimeter is maintained in a booth or cabinet, not less than 40 in. wide and 30 in. deep. The booth or cabinet is closed so that no external light can enter. The inside of the booth is painted a dull neutral gray of Munsell value 4. The booth is illuminated by a 15-watt daylight bulb, mounted 48 in. above the colorimeter box in an indirect fixture so that no direct rays strike the colorimeter or the eye of the reader. The level of illumination in the booth, at top of the box of the colorimeter, is to be not less than 1, nor more that 5 foot candles.
3. *Color Glasses.* Color glasses shall be callibrated to conform to the National Bureau of Standards N″ Scale. Glasses may be calibrated by the Electrical Testing Laboratories or may be compared against a standard set calibrated by the Electrical Testing Laboratories or the National Bureau of Standards. The method of comparison shall conform as nearly as possible with that outlined in Bureau of Standards Research Paper 653, p. 274.
   The minimum standard set shall consist of the following numbers of red and yellow glasses:

   Red:

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1.0	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0
7.6	8.0	9.0	10.0	11.0	12.0	16.0	20.0	

   Yellow:

1.0	2.0	3.0	5.0	10.0	15.0	20.0	35.0	50.0	70.0

   Glasses above 1.0 red need not have the exact value shown in the table but should cover the same range.
   Caution: Keep the color glasses clean and free from oil film. Handle carefully and protect against scratches. It is especially important that every color glass be clean at the time of use.
4. *Color Tubes.*
   a. Description. Color tubes of clear, colorless glass with a smooth, flat polished bottom and of the following dimensions: length 154 mm. over-all, inside diameter 19 mm., outside diameter 22 mm.

b. Markings. The color tubes are provided with two etched marks, one to indicate an oil column of 133.35 mm. (5.25 in.) and another to indicate an oil column of 25.4 mm. (1 in.).

5. *Filter Paper.* Filter paper, fine porosity such as Eaton and Dikeman No. 512, Whatman No. 12, Reeve-Angel No. 871, or S & S No. 596.

B. PROCEDURE

1. Crude, raw, and refined samples must be treated with 0.5 g. of official diatomaceous earth per 300 g. of oil. Add the diatomaceous earth to the oil and agitate for 2½ min. at 250 r.p.m. at room temperature, or at no more than 10° to 15°C. above the melting point of the fat, if necessary, and filter through an approved paper. Oils which have just been bleached in the laboratory, in accordance with A.O.C.S. Methods Cc 8a-52, Cc 8b-52, or Cc 8d-48, normally are sufficiently clear for the color determination. Suspended material, even if of colloidal size, will cause light scattering. If the sample is not absolutely clear, treat with official diatomaceous earth, as outlined previously, and filter before proceeding with the color determination.

2. Adjust the temperature to 25–35°C., and fill the color tube to the desired mark. If the sample is not completely liquid at 25–35°C., heat to a temperature of not more than 10°C. above the point of complete melting.

3. Place the tube containing the sample in the colorimeter, and put along side of it such red and yellow glasses (see paragraphs a, b, and c) as are necessary to match the color of the oil, observing the sample of the oil and the glasses through the eyepiece.

a. *Crude and Raw Oil Color.*

Crude oils of the coconut type: read the color, using proper ratio of yellow to red listed below:

Up to 3.9 red use	6 yellow to 1 red.
4.0 to 4.9 red use	25 yellow.
5.0 to 5.9 red use	30 yellow.
6.0 to 6.9 red use	35 yellow.
7.0 to 7.9 red use	40 yellow.
8.0 to 10.9 red use	50 yellow.
11.0 to 14.9 red use	70 yellow.
15.0 to 19.9 red use	100 yellow.
20.0 and above use	150 yellow.

If the above ratios fail to give a satisfactory match, this fact should be noted and a second reading made, using the amount of yellow color required for a good match. Report both readings.

Raw inedible oils: tallows, greases, fatty acids, etc.

10 yellow to 1 red, up to 3.5 red.
35 yellow for 3.5 red to 5.0 red inclusive
70 yellow for above 5.0 red.

Dark oils: if the color of the oil or fat sample exceeds 40.0 red, when using the regular 133.35-mm. column, fill another tube to the 25.4-mm. mark and read the color under the same conditions as described for the longer column. (It is assumed that any color result, in which the column height is not designated, has been read on a 133.35-mm. column.)

b. *Refined Oil Color.*

Use only 1 yellow glass, 35 yellow for refined cottonseed oil and refined peanut oil; 70 yellow for refined soybean oil. Use not more than 2 red glasses up to and including 13.0 red, and not more than 3 red glasses above 13.0 red.

c. *Refined and Bleached Oil Color.*

The ratio of yellow to red to be used in determining color is as follows, except where Trading Rules specify the yellow and/or red to be used in determining given grades:

Cottonseed, peanut, and corn oils—10 yellow to 1 red up to 3.5 red; 35 yellow for 3.5 red or above.

Coconut and palm kernel oils—6 yellow to 1 red up to 3.9 red; 10 yellow to 1 red for 3.9 red or above.

Soybean oil—10 yellow to 1 red up to 3.5 red; 70 yellow for 3.5 red or above.

Tallows, greases, fatty acids, etc.—10 yellow to 1 red up to 3.5 red; 35 yellow for 3.5 to 5.0 red inclusive; 70 yellow for above 5.0 red.

C. NOTES

Off-Color (Hue) Oils. Some oils are at times subject to abnormalities in the composition of their pigment content. This results in the occurrence of hues which cannot be matched, even approximately, using the fixed yellow, or yellow to red, ratio designated above. In such cases, if a standard combination is specified, report whether the oil is lighter or darker than the standard. If a standard combination is not specified, report the yellow and red glasses which most nearly match the color of the sample.

ABSTRACTS . . . R. A. REINERS, Editor

ABSTRACTORS: Lenore Petschaft Africk, R. R. Allen, S. S. Chang, Sini'tiro Kawamura, F. A. Kummerow, and Dorothy M. Rathmann

• Oils and Fats

The separation of complex lipide mixtures by the use of silicic acid chromatography. T. Hirsch, E. H. Ahrens, Jr.(The Rockefeller Inst., N. Y. City). *J. Biol. Chem.* 233, 311–20 (1958). A method is described for the separation of complex lipide mixtures into chemical classes by elution from a single column of silicic acid. The method has been tested by the separation of synthetic mixtures and the mixture of lipides found in human plasma. Some of the many possible applications are illustrated.

Some recent developments in phospholipide chemistry. G. Jacini. *Oléagineux* 13, 39–52(1958). A discussion is given regarding glycerophosphatides (synthesis, chromatographic and countercurrent fractionations, C_{18}–C_{22} fatty acids, lecithinases, and lysophosphatides), plasmalogens, inositophospholipides, sphingomyelin, and sphingosine. (*C.A.* 52, 12123)

Presence of sitosterol in soft and hard wheat flour. G. Fabriani (Ist. nazl. nutriz. del Cons. nazl. ricerche, Rome) and A. Fratoni. *Quaderni nutriz.* 15, 130–41(1955)(Pub. 1956). The sitosterol content (in mg.-%) of Italian soft and hard wheat varieties was given. For macaroni samples of hard and soft wheat seminola, contents of 0.86–2.08 and 8.53, respectively, were found. (*C.A.* 52, 12258)

Influence of rancidity in cereals. K. Karp. *Oléagineux* 13, 153–6 (1958). The fat content of cereal grains is physiologically important. The rye germ oil has the highest content of linoleic acid, the most important of the essential fatty acids. In breadmaking, it is essential from the quality standpoint, to prevent the labile germ oil from autoxidizing and becoming rancid. A fat-stable and undamaged grain should be used. Twelve references. (*C.A.* 52, 12257)

Human milk fat as ointment base. J. Schmid. *Pharm. Zentralhalle* 94, 1–3(1955). Pooled human milk, unsuitable for infant feeding, is churned, separated, the butter layer extracted with ethyl ether, dehydrated with sodium sulfate, and the ethyl ether distilled off. The fat, with or without water, is nonirritant and readily absorbed by the skin. It is used in various ointments. (*C.A.* 52, 12316)

Infrared spectrophotometry of linseed oil. Comparative autoxidation of the cis and trans forms in the case of one double bond. J. P. Helme and J. Molines. *Oléagineux* 13, 141–8(1958). A study was made of the infrared absorption spectra of linseed oil, both raw and treated (stand oil), and of the relative autoxidation of the *cis* and *trans* forms of the oil. The 10.35-micron band was found to correspond to the formation in the treated oil of the highly active *trans* form, which autoxidizes more slowly than the *cis* form. (*C. A.* 52, 12418)