REPORT OF SOAP STOCK COMMITTEE 1938-1939

THE Soap Stock Committee in 1937-1938 studied the dry extraction and wet extraction methods for determination of total fatty acids in acidulated and non-acidulated soap stock. These methods were revised and adopted. During the past year the method for total fatty acids of soap stock or acidulated soap stock from copra and palm kernel oil was rewritten, making it consistent with those adopted last year. The only change in technique is the use of 125 ml. rather than 50 ml. of petroleum ether in the first extraction.

Proposed Method for Total Fatty Acids of Soap Stock or Acidulated Soap Stock from Copra, Palm Kernel and Other Oils of Similar Characteristics. (cf. A.O.C.S. Methods p. 19 or N.C. P.A. Rule 276, Sec. 4)

Weigh out from a weighing bottle 8 to 10 grams of a well mixed sample of soap stock or 4 to 5 grams of acidulated soap stock and transfer to a 400 ml. beaker. Saponify with 50 ml. of 95 per cent alcohol and 2 to 3 grams of stick potassium hydroxide, or an equivalent of stock alcoholic solution of potassium or sodium hydroxide, by heating on the steam bath under a watch glass, with frequent stirring, for at least thirty minutes. After saponification is complete, remove the watch glass, continue heating on the steam bath with stirring, until the alcohol is driven off. The soap should not be evaporated dryer than to a pasty mass. If necessary, a small amount of water may be added when most of the alcohol has evaporated.

When the alcohol has evaporated, add 100 ml. of water and heat until the soap is dissolved. Wash the contents of the beaker into a glass stoppered cylinder with hot water, taking care not to exceed 130 ml. total volume in the cylinder. Add 3-5 drops of methyl orange indicator and acidify with dilute hydrochloric acid (1:1), carefully avoiding too large an excess. Mix gently by rotating the cylinder. When the cylinder has cooled to 50° C. add 125 ml. of petroleum ether. (See Specifications, Rule 272, Section 3). It is not necessary for the fatty acids to have cleared thoroughly. Stopper cylinder and shake gently, then allow to stand until the petroleum ether layer has separated. Siphon off this petroleum ether layer through a 9 cm. filter paper. (See Specifications, Rule 276, Section 2), into a 600 ml. beaker. If this extract is cloudy, it should be refiltered but any subsequent cloudiness may be disregarded. Make at least four more extractions, using 25-30 ml. of petroleum ether and shaking the cylinder vigorously for at least 30 seconds for each extraction.

Filter each petroleum ether extract through the same filter paper as the first, allow the filter paper to drain well, then wash with a spray of petroleum ether from a wash bottle until all fatty acids are extracted. Evaporate the petroleum ether solution to not less than 50 ml. Add 50 ml. of 95 per cent ethyl alcohol, redistilled from caustic, to which a few drops of phenolphtalein have been added. Titrate with N/1 sodium hydroxide. Evaporate off the petroleum ether on a steam bath, then concentrate until the volume is reduced to about 25 ml. Transfer with hot 95 per cent alcohol, redistilled from caustic, to a 250 ml. beaker tared with a stirring rod. Finish evaporating and dry in an oven at 105-110 degrees C. to constant weight. Stir occasionally while evaporating and drying.

In order to calculate the soda soap to fatty acids a correction must first be made for neutral salts in the sodium hydroxide solution. Neutralize 20 ml. of the N/1 sodium hydroxide with N/2 HCl, using a small amount of phenolphthalein as indicator. Evaporate to dryness and heat to constant weight at 105-110° C. From the weight of the residue found subtract the weight expected if the reagents had been 100 per cent pure. The difference divided by 20 is the correction per ml. for neutral salts. The per cent total fatty acids is then calculated from the formula:

$$\%\text{T.F.A.} = \frac{W - [(0.22 + C)T] \times 100}{S}$$

Where W = Weight of soda soap
C = Correction per ml. for neutral salts

Table 1. Comparison of Results (as % T.F.A.) Obtained with Tentative Official Dry Extraction and Tentative Official Wet Extraction Methods.

	Barrow		Lappen		Long		Reese		Rich		Watkins	
	Dry Ext. Met.	Wet Ext. Met.	Dry Ext. Met.	Wet Ext. Met.	Dry Ext. Met.	Wet Ext. Met.	Dry Ext. Met.	Wet Ext. Met.	Dry Ext. Met.	Wet Ext. Met.	Dry Ext. Met.	Wet Ext. Met.
Sample 1. Peanut S. S.					35.44	35.87			35.18	35.82	35.36	35.31
Sample 2. Soya Bean S.S.	38.25	[a]38.00	38.09	38.18			38.26	38.32			38.18	38.35
Sample 3. C.S. S. S.					38.52	39.25			38.23	39.66	38.66	38.93
Sample 4. Acid. C.S.S.S.	[b]88.94	c	87.98	87.05			86.68	86.17			86.34	86.74
Sample 5. Corn Oil S. S.									38.56	38.25		

a — Dried at 105° C.
b — Constant weight at 100° C. 88.94. Constant weight at 105° C. 86.0.
c — At 105° C. sample continued to lose weight for 21 hours.

T = Titration of fatty acids with N/1 NaOH
S = Weight of sample used

RECOMMENDATIONS

The Committee recommends (1) that the tentative dry extraction and wet extraction methods for total fatty acids of all soap stock and acidulated soap stock, except from copra and palm kernel oils be adopted as official; (2) that the revised method for total fatty acids of soap stock or acidulated soap stock from copra and palm kernel oil be adopted as tentative; (3) that during the following year a survey be made of the various methods for determining neutral oil in soap stock with a view to working out a method suitable for adoption by the Society.

Table II. Results Using Proposed Method for Total Fatty Acids of Soap Stock or Acidulated Soap Stock from Copra and Palm Kernel Oil.

	Barrow	Lappen	Long	Reese	Rich	Watkins
Sample 6. Cocoanut S.S.			44.80		46.27	45.49
Sample 7. Cocoanut S.S.	58.77	58.61		58.97		58.48
Sample 8. Acid. Cocoanut S.S.	95.68	96.74	96.05	96.34	96.68	96.95
Sample 9. Palm Kernel S.S.						38.32

The Committee wishes to thank the following for sample material:
Corn Products Refining Co., Argo, Illinois.
Durkee Famous Foods, Chicago,
Lookout Oil and Refining Co., Chattanooga, Tenn.
The Southern Cotton Oil Co., Ill.
Savannah, Ga.

Respectfully sumbitted,
E. R. Barrow
J. J. Lappen
C. P. Long
W. J. Reese
A. D. Rich
W. T. Watkins, Chairman

Report of the Uniform Methods and Planning Committee May 6, 1939

DURING the past year Mr. T. C. Law, who is Chairman of the Chemists' Committee of the National Cotton Products Association, was made a member of the Uniform Methods and Planning Committee. This has been very helpful, inasmuch as now the two committees can work much more closely together and we feel that in time it will eliminate any discrepancies between the methods of the American Oil Chemists' Society and those published in the Rules of the National Cotton Products Association.

We shall discuss the reports received from the various committees, particularly those which carried any recommendations and shall present the views and recommendations of the Uniform Methods and Planning Committee. We hope that members of the Society will feel perfectly free to discuss these recommendations, in order that we may all be in agreement on the final action taken by the Society.

Color Committee:

This committee has rewritten the method for determining the colors of oils and fats. You have all heard the report presented and have received copies of it. With certain changes the Uniform Methods and Planning Committee approve this report. In describing the booth or cabinet which should contain the colorimeter, we suggest the following wording in place of that suggested:

"The colorimeter should be placed in a booth or cabinet not less than 40 inches wide and 30 inches deep, and closed so that no external light can enter."

In describing the type of light to be used the committee has likewise suggested a change, the paragraph on this subject to be changed as follows:

"The booth should be illuminated by a 15 watt daylight bulb mounted 48 inches above the tintometer 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 the colorimeter, should not be less than 1 or more than 5 foot candles."

There are also some slight changes in the paragraph headed "(b) Determination." This should read, when corrected, as shown below:

"(b) Determination. — Fill a tube (see paragraph above) with the oil to be examined to a depth of 133 mm. Oil must be at a temperature of 20° to 24°C. and must be absolutely clear and transparent. Filter through approved filter paper, such as Eaton & Dikeman or Reeve Angel No. 230, at 20° to 24° C. if necessary to remove turbidity to permit matching the color, and in such cases note on your report that filtering was necessary. If, however, the oil or fat under examination is not completely liquid at 20° C., heat until completely liquefied, and read the color at a temperature not more than 10°C. above that at which it becomes completely liquefied. Place the tube containing the oil in the tintometer and place alongside of it such yellow and red glasses (see paragraph (a)) as are necessary for making comparison desired, observing the colors of the oil and the glasses through the eyepiece.

"Crude Oils of the Coconut Type. — Melt the oil in water at a temperature not exceeding 50°C. and filter through approved filter paper at a temperature not above 35°C. If not clear refilter once. Read the color using proper ratio of yellow to red listed below:"

With these changes the Uniform Methods and Planning Committee approve the report and move its adoption as a tentative method for the coming year. The motion was seconded and passed by the Society.

Committee on Indicators:

The recommendations of this committee are as follows:

"That thirty-five thousandths per cent alcohol soluble aniline blue in isopropol alcohol shall be designated as an alternate indicator.

"Second, that the Secretary of the Society shall be instructed to purchase a supply for sale to the membership.