ABSTRACTS

Soaps

Edited by **M. L. SHEELY**

Standard Methods of Soap Analysis. *Perfumery and Essential Oil Record* 26, 10, 401 (October, 1935). International Standard Methods for the Analysis of Soap were considered at the annual meeting, recently held in London, of the International Commission for the Study of Oils and Fats. The methods discussed were merely tentative ones which had been suggested by the central bureau of the commission as the result of consideration of the various proposals received from the different countries represented, and it was decided that these should be further considered, together with certain methods put forward from this country, and that the subject should be dealt with more fully at the next annual reunion of the commission, which it is proposed to hold in Lucerne in August of next year. Some of the tentative methods suggested have already been discussed in these columns, and it is doubtful whether they would prove acceptable to British soap chemists.

Meanwhile, the sub-committee of the Society of Public Analysts, which dealt with the matter of Determination of Unsaponified Fat in Soap ("P. & E. O. R.," 1935, p. 322), has now been reappointed by the parent committee, the Analytical Methods Committee of the Society of Public Analysts, under the title of Subcommittee on Methods of Soap Analysis, and this subcommittee will doubtless have come to some conclusions on the subject of soap analysis before the next meeting of the International Commission.

Synthetic Detergents in the Laundry. *Oil and Colour Trades Journal* 88, 1930, 1087 (October 11, 1935). Dr. Oskar Uhl ("Seifens. Zeit.," 1935, 62, 687-9, 719-20). The structure of the new synthetic detergents—the sulphonated fatty alcohols and the fatty acid condensation products—is briefly described and their valuable properties in certain specified uses, especially in the textile industries, are indicated. From the laundry point of view, however, and particularly in dealing with white articles, these comparatively new preparations appear to have their limitations and even disadvantages, unless these are prepared for, and to some extent counterbalanced by, suitable additions to the synthetic products or by subsequent further treatment in the wash. These disadvantages are attributed partly to the absence of any alkaline action, since these new preparations are completely neutral. The author is definitely of the opinion that they cannot entirely replace ordinary soaps in the laundry, especially in the small and so-called economical proportions sometimes claimed, such for example, as one-sixth of the concentrations ordinarily used for laundry soaps. Some practical tests were carried out both with the new detergents and with ordinary soap for washing soiled white goods, and more particularly those which had been stained in some way, as it is found in this latter direction that the alleged shortcomings of new detergents are most marked. No bleaching agents were apparently used. Owing to their neutral state, these products can be used at a high temperature—up to boiling point, and at these temperatures it was found that a grayish-tinted finish of the white articles was produced. This is probably due to the fact that, despite their excellent wetting, emulsifying, and other properties, they were lacking in the requisite dirt-dissolving and dirt-removing qualities. The addition of alkali, and the consequent difficulty of lime-soap formation, is briefly discussed. It is concluded that the ideal soap for the various exacting requirements of laundry and textile work has not yet been evolved, despite the fact that many new combinations of soap with the new synthetics have been introduced, containing from 10 to 30 per cent synthetic to insure lime-resistance. In this connection the fatty acid condensation products have shown greater protective-colloid effect than the fatty sulphonates. The production of an ideal preparation by merely adding a certain percentage of synthetic detergent to ordinary soap is considered doubtful. On the other hand, a true soap may yet be evolved which will better meet all the requirements, and for this it is necessary to consider the three points: the nature and properties of the particular textile fibre, molecular structure and especially carbon linkage, and the position of the sulpho group. It is obvious that fibre structure plays an important part, and some recent research with cottons and woolens have shown this very clearly, including a special study of gel formation and filtration. The question is further illustrated by tests in the removal of rust stains from various types of fabric; also by the differences between cotton and linen fabrics in the retention of oxidation and fatty acid products if acid soaps, e.g., a rancid olive oil soap, should perchance be used. The nature and position of the sulpho group appears to be a decisive factor.

A Study of Some Fat Acids and Their Soaps as Contact Insecticides. L. E. Dills and H. Menusan, Jr. Contrib. Boyce Thompson Inst. 7, 63-82 (1935). As tested on bean and rose aphids, capric and lauric acids are more toxic than oleic, caprylic, myristic, caproic and palmitic acids, while stearic is least toxic. The decreasing order of toxicity of K soaps is: oleate, laurate, caprate, followed by equally toxic caprylate, myristate and palmitate, which are more toxic than stearate and caproate. Addition of nicotine to soap solutions does not alter the order of toxicity. Soap plus nicotine sulfate does not give additive toxicity, but the better-spreading soaps increase the effectiveness of nicotine. Olive oil soap is more toxic than soaps made from coconut, castor, corn, palm, cottonseed or fish oil. The relation of surface tension and angle of contact to toxicity is determined. The order of toxicity of fat acids to plants is the same as that with insects. Fourteen references. (C. A. 29, 20, 7005, October 20, 1935.)

Free Alkali and pH of Soaps. *Oil and Colour Trades Journal* 88, 1932, 1245 (October 25, 1935). Among the various methods used for determining the free alkali content of soaps, according to Vizern and Guillot ("Matieres Grasses," 1935, p. 10593) that consisting of the titration of the alcoholic solution of the sample is the only one which should be retained. The authors also describe the following methods: (a) Free Alkali—The soap is dissolved in 80 per cent alcohol and a known amount of a fatty acid of known molecular weight added. The uncombined acid is then titrated back with standard soda solution, from which the amount of fatty acid used by the free alkali can be calculated. (b) Carbonated Alkali—This is determined

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after titration of the free caustic alkali in the alcoholic solution of the soap, using phenol phthalein as indicator. The strength of the alcohol reduced to 50 per cent by the addition of water, when, in the presence of carbonate, the indicator will again turn red. The titration with standard acid is continued, and the reading represents one-half of the carbonate alkali present. Finally, the authors have studied the pH of 0.01N solutions of soaps (the strength at which they are commonly used). It is shown that the pH is not an indication of the free alkali content, because the pH varies very little with an increase in free alkali. The variation is less the higher the molecular weight and titre of the fatty acids.

Some Observations on Palm Oils. Harold Silman, B.Sc., A.I.C. *Perfumery and Essential Oil Record* 26, 10, 402 (October, 1935). The glycerides present in palm oil are approximately as follows: palmitic acid 35.5%, stearic acid 8.5%, myristic acid 1.0%, oleic acid 48.0%, and linoleic acid 7.0%.

An oil of good, soft quality should have some such characteristics as the following:

Specific gravity (15° C.)	.921– .937
Refractive index (60° C.)	1.451–1.453
Iodine Value (Wijs)	53–56
Saponification number	195–200
Unsaponifiable Matter	.3–.7%
Titre	43°–45°

The reddish color of palm oil is due chiefly to the presence of carotin and xanthophyll in very small amount; on exposure to air bleaching of the fat takes place so that the color becomes rather yellow, and rancidity and increased acidity are observed. Some recent experiments have adduced evidence which tends to show that the carotin may in part function as a natural preservative.

Although the bleaching of palm oil, in common with maize, soya, and similar dark oils, is a rather more lengthy process than that involved in the bleaching of other fats, it is advisable to conduct the operation as rapidly, and at as low a temperature, as is practicable. It has been shown that excessive exposure to heat and air results in a definite hardening and deterioration of the product; the iodine value is usually somewhat lowered, with a corresponding increase in the titre.

The causes of difficulties in bleaching are various. The presence of certain impurities is likely to render the bleaching process more slow, and among these are mucilaginous matter, resins, carbohydrates and phosphatides. Overheating of the oil during any period is likely to increase bleaching troubles. Various means of accelerating the bleaching have been suggested from time to time. Borates and resinates of cobalt, when present to the extent of some .01 per cent, are said to enable palm oil to be bleached at 90° C. in from 1½ to 2½ hours, or a little longer if the oil is neutral. A number of other similar "accelerators" are available, but they do not seem to have been taken up to any extent by the industry.

Chemical bleaching by means of sodium dichromate and hydrochloric acid is used to a considerable extent for palm oil; this process, unlike the absorption method, does not affect the characteristic violet odor of the palm oil, and it is, therefore, largely used where the oil is destined for soap production. About 30 lbs. of dichromate-acid mixture are required per ton of oil, which is agitated with the former at 50° C. until the required degree of whiteness is attained. After settling and running off the acid, two washings with hot water are sufficient to free the fat from chromates. This method is rapid and effective. Other bleaching materials include hydrogen peroxide for which outstanding advantages are claimed by the patentees, especially as the sole decomposition products obtained in its use are water and oxygen.

Alkali refining is stated to increase the stability of the oil. Here caustic alkalies are used to remove the free fatty acids, but the method can only be applied when these are present in comparatively low proportions, i.e., in high-grade oils. Sodium carbonate and milk of lime find a limited application in this connection. The alkali also reacts with the coloring matter, so that bleaching is effected at the same time.

PATENTS

Germicidal Mercury Soaps and Detergents. A patent by Lever Bros., Ltd., was published a short time ago ("B. P.," 427,324; "P. & E. O. R.," 1935, p. 323), which covered the addition to soap of some aromatic mercury compounds, such as phenyl mercuric nitrate, phenyl mercuric acetate, lactate, benzoate, ricinoleate, etc., all of which gave nontoxic germicidal soaps.

An improvement on this patent has been communicated by Lever Bros. Co., of the United States, and now patented by Lever Bros., Ltd., in this country under B. P. 432,589. The improvement consists in the use of a mercury compound in which the acid radiole of such compounds as are mentioned in the earlier patent is replaced by an organic radiole containing an imido group or groups. Such compounds are, for example, mercury derivatives of hydrazobenzene, guanadine, o-benzoic-sulphimide, phthalimide, pyrrole, indole, piperidine, carbazole, isatin. It is claimed that the addition of 0.1 per cent of such substance is sufficient to produce a good germicidal soap, and that up to 0.5 per cent gives a soap sufficiently strongly disinfectant for use in hospitals or by physicians and surgeons.

The mercury compound is best dredged into a small portion of the soap, and, after well mixing, this is incorporated in the whole batch, which is then milled, plodded, and stamped as usual; or the mercury salt may be crutched into the liquid soap in the crutching pan. (*Perfumery and Essential Oil Record* 26, 10, 400, October, 1935.)

Use of Glycerine in Cellulose. U. S. 2,013,739, September 10, 1935. H. H. Wright to du Pont Cellophane Company. A method of preserving gel regenerated cellulose pellicles in which glycerine is used as a softener.

Use of Glycerine as Solvent. U. S. 2,013,663, September 10, 1935. William M. Malisoff to the Atlantic Refining Company. Removal of sulfur compounds from non-viscous hydrocarbon oils with glycerine or similar solvents.

Polyglycol or Polyglycerol. U. S. 2,014,381, September 17, 1935. E. F. Izard to du Pont Viscoloid Company. An ester of isobutyric acid with a polyglycol or polyglycerol.