

ABSTRACTS

Soaps

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Properties of Oils and Fats in Relation to Uses. H. E. Gorman. *Can. Chem. Met.* 18, 22-4 (1934).—The Twitchell method of fat acid separation gives percentage of saturated acids, the percentage of solid unsaturated acids and together with the I value gives a basis for calculating the content of oleic and linolic acids. The Kaufman thiocyanogen number gives the percentage of unsaturation and by difference the amount of saturated acids. The percentage of acids having more than 1 unsaturated bond can be obtained by comparison with the I value. SCN is taken up only by 1 bond, I by all the unsaturated bonds; hence the difference between the 2 values indicates the presence of unsaturated acids having more than 1 unsaturated bond in their structure and the amount of the difference gives the percentage of such acids present. Chemical constants of 9 fats and oils are tabulated. (C. A. 29, 1, 367, 1935.)

Free Fatty Acids and "Acid Values." *Perfumery and Essential Oil Record* 26, 1, 32 (1935).—The proportion of free fatty acids in a fat or oil is of importance to the soap-maker, not only as an indication of the quality of the fat, but also as to the yield of glycerin to be expected on saponification and the suitability of the material for certain special types of soap, e.g., cold process soap. Most soapmakers are accustomed to the acidity of their materials being expressed in terms of oleic acid, or, in the case of coconut or palm kernel oils, as lauric acid. It has also been recommended in the past that the free fatty acids of palm oil should be calculated as palmitic acid, which gives a figure about 10 percent lower than if calculated as oleic acid, but Margailan and Allemand (*Chem. et Ind.*, 1934) have recently shown that the actual percentage of acidity in palm oil is more correctly expressed in terms of oleic acid. In such a method of expression it is assumed that the acidity in the fat or oil is there either entirely as oleic or as lauric acid, an assumption which is hardly likely to be quite correct.

It is now becoming increasingly common, particularly where standards are laid down, as in the British Pharmacopoeia, to calculate acidity in terms of "acid value," i.e., the milligrams of potassium hydroxide required to neutralize the acidity in 1 gm. of oil or fat, and this has the advantage that it states exactly what is determined in the analysis, without any assumption as to the nature of the acid which is present. It is, however, rather confusing to one who is not a chemist and has been accustomed to the older method of expression. It is helpful in such a case to remember that acidity expressed as acid value is approximately double the figure obtained if calculated as oleic acid, or 2.8 times that calculated as lauric acid.

In the determination of free fatty acids it is sometimes recommended that in addition to the neutral alcohol usually added there should also be admixed a fat solvent as ether or benzene. This does not appear to be really necessary, but where the use of a fat solvent is preferred, Wittka suggests (*Allgem. Oel-u. Fett-Ztg.*, 1934, 197) the use of a good neutral kerosene, as being less expensive and less volatile.

Unsaponifiable Matter as a Guide to the Constitution of a Soap. *Perfumery and Essential Oil Record* 26, 1, 33 (1935).—Side by side with the rapid elucidation of the constitution of the glycerides in natural fats and oils, brought about mainly as the result of Prof. Hilditch's work at Liverpool University, a good deal of knowledge is now being accumulated as to the constitution of the unsaponifiable matter which in nature accompanies these glycerides, though in much smaller proportions; indeed, it seems probable that at no distant date an examination of the unsaponifiable matter from a soap will play a very important part in establishing the composition of the fats from which the soap has been made. Already there is the so-called phytosterol acetate test which enables one to differentiate between animal and vegetable material, and the unsaponifiable matter shea nut oil is sufficiently characteristic to enable one to detect it, whilst Bolton and Williams showed a few years ago (*"Analyst,"* 1930, 5; *"P. & E. O. R.,"* 1929, 507) that a determination of the iodine value of the unsaponifiable matter enabled one to determine if one was dealing with pure olive oil.

Researches on the composition of unsaponifiable matter in various fats have been reported from time to time in these columns, and we have now, in the current issue of the *"Analyst"* (Jan., 1935, p. 23) the record of an investigation by Prof. Drummond and T. Thorbjarnarso on the unsaponifiable matter in olive oil, in which it is shown that a considerable proportion of this, varying, with oils of different origin, from 31 to 64 percent of the unsaponifiable matter, consists of an unsaturated hydrocarbon apparently identical with squalene found in marine oils by Tsujimoto and by Heilbron. There is also present a mixture of saturated aliphatic hydrocarbons and various sterols, sitosterol, dihydrositosterol, ergosterol, and dihydroergosterol.

Lecithin in Soap. *Perfumery and Essential Oil Record* 26, 1, 33 (1935).—Now that lecithin is being produced from soya beans on a fairly considerable scale—a Continental firm was recently reported to have erected a plant for the production of about 20 tons per day—it seems possible that it may find use as an addition to toilet soaps. It is already used as an ingredient of skin creams, and as it is claimed to be an excellent agent for reduction of surface tension and a very good emulsifier, it should have a high detergent value. Lecithin was formerly obtained chiefly from egg yolk, in which it occurs to the extent of about 8 per cent and this product was dark in color, but the lecithin obtained from soya beans, which yield about 2 percent is, as marketed, much paler. Lecithin is sometimes bleached by treatment with hydrogen peroxide, and the use of dibenzoyl peroxide for the purpose has been patented.

PATENTS

Fat Hydrolysis By Electricity. The hydrolysis of fats into glycerine and fatty acids may be greatly accelerated by passing an alternating current through the heated mass, according to U. S. Patent 1,976,376, issued to Erwin F. Spellmeyer. Any of the usual processes may be used, but the Twitchell Method is recommended due to its simplicity. Hydrolysis by this process ordinarily takes from 32 to 36 hours. By the use of alternating current, the time required for the reaction may be reduced to 6 or 8 hours. A further advantage is that the quantity of hydrolyzing catalyst can be reduced and in some cases entirely eliminated. An example follows. The mixtures were kept at the boiling point during the runs by the use of an open steam coil immersed in the mixture.

Ingredients	% by Weight
Sulfuric acid, 60° Be	3
Twitchell reagent	1
Water	38
Olive oil	58
Current: 0.25 amperes. 3 to 5 volts.	
Time of Run	Conversion
1 hour	38% fatty acids
2 hours	60% fatty acids
3 hours	77% fatty acids
4 hours	86% fatty acids
6 hours	91% fatty acids
9 hours	complete

The effectiveness of the system is ascribed to a large increase in the number of ions present in the mixture as the result of the passage of current in alternate directions. (*Soap XI*, 1, 59, 1935.)

Distilling Glycerol, Fatty Acids, Etc.—British 412,080, June 21, 1934. George Wm. Riley and George Scott & Son (London). Ltd. Addition to 408,259 (C. A. 28, 5724). In distilling high-boiling products under high vacuum in the apparatus of 408,259, a relatively small proportion of steam (up to 30 per cent of the weight of the distillate obtained) is introduced at such a temperature that it does not heat the distillation mass, or is formed in the mass by vaporization of H₂O therein. (C. A. 29, 2, 630 1935.)