ABSTRACTS

David Wesson, *Abstract Editor*

COCONUT oil originating in the Dutch Indies may be adulterated with peanut oil or kapok oil at present prices. Peanut oil may be detected by determining the temperature of crystallization of the fatty acids, which will be several degrees higher than that of pure coconut oil acids. Kapok oil may be detected by the Halphen reaction. *Pharm. Tidschr. Nederl.-Indie* 4, 245-5.

Sulphur in soaps or in fatty oils, regardless of the form in which it may be present, can be detected by mixing the powdered dry soap with sulphur-free iron powder, heating the mixture to redness in a test-tube, cracking the tube and contents in dilute hydrochloric acid and testing for hydrogen sulphide. All sulphur is converted to iron sulphide under the conditions of this test. *Seifensieder Ztg.* 55; 289-90 (1928).

The nature of the unsaponifiable matter in train oil or dégras may be conjectured from the amount present and its iodine number. If the amount is high and its iodine number above 70, mineral oil or wool grease may be considered absent. If the iodine number of the unsaponifiable is below 50, the addition of such adulterants is indicated, in the absence of sulphonated or oxidized oils, which also lower the iodine number. *Ledertech. Rundschau* 20, 177-80 (1928).

Ultra-filtration has been suggested as a method of purification and stabilization of oils and fats. Tests of first-rendering lard over a period of four months indicated considerably less increase in free fatty acids in material which had been subjected to ultra-filtration. *Chimie et Industrie* Special No. 518-19 (April, 1928).

Variations in the character of the linseed oils of the world are closely associated with geographical location, according to the botanical investigations of S. and N. V. Ivanov, who find that the greater the number of unsaturated bonds in any oil, the greater is the dependence of quality upon climate. *Chem. Umschau Fette, Oele, Wachse u, Harze* 35, 157-66 (1928).

No detectable amount of simple trilaurin is present in coconut oil or palm-kernel oil, and little or no triolein. The fatty acids in these oils appear to be combined with glycerol on the principle of general even distribution, resulting in a conglomerate of a large number of individual glycerides. While the acidic groups of any individual glyceride are never all the same, two of them may be alike, or all three may differ. The whole amount of saturated acids linked with unsaturated acids in the mixed saturated-unsaturated glycerides is approximately equivalent to the amount of unsaturated acids present in the whole fat. G. Collin and T. P. Hilditch, *J. Soc. Chem. Ind.* 47, 261-91 (1927).

Mackey apparatus tests on the self-ignition liability of oiled wool have confirmed the greater safety of olive and peanut oils for wool-oiling and the danger of catalytic acceleration of spontaneous combustion when manganese and iron resinates and similar driers are used. *Leipzig. Monatschr. Textil-Ind.* 43, 162-3,210-1, 258-9 (1928).

Purification of Oleic Acid

Commercial oleic acid, according to analysis, contained 3.6 to 13.8% saturated fatty acids. In natural oils the percentage of oleic acid can be calculated as follows:—

$$A = 100 - O - 0.02258V$$

$$X = 1.986\ (A.\text{-}v) - 1.096$$

in which A = the total fatty acids,
O = non-saponifiable matter,
V = saponification number,
v = percentage of saturated fatty acids.
X = Percentage sought.

With this formula the following percentages of oleic acid were found for some oils and fats:—

Oil or fat	Oleic acid %
Olive oil	61
Almond oil	50.5
Earthnut oil	51.5
Oleomargarine	43.5
Lard	30.5
Palm oil	38.5
First run oil	37
Sesamum oil	37
Cottonseed oil	18

Thus olive, almond and earthnut oils are the best for preparing oleic acid. Bertram obtained

oleic acid for these experiments from earthnut oil, the latter containing 17.4 to 20.3% of saturated fatty acids, according to the source from which the oil came.

All the known methods for purification of oleic acid were examined to separate it from the saturated fatty acids, as, for example, purification with lead and barium salts, distillation in a vacuum, crystallization of lithium soaps in alcohol, ammonium and sodium soaps in ether, solubility of copper soaps in petroleum ether, purification with amides and anilines, fractional crystallization, bromination by the Grun method, freezing in petroleum ether, precipitation by treatment with dibromostearic acid in various solutions, as, for example, petroleum ether, acetic anhydride; petroleum ether and 70% alcohol; paraffin oil and 70% alcohol; paraffin oil and methyl alcohol; petroleum ether and aniline; petroleum ether and phenol; paraffin oil and phenol, etc.

All these methods gave unsatisfactory results. Oleic acid, it seems, has a tendency to form mixed crystals in presence of saturated fatty acids, and thus is explained the uselessness of the various attempts to purify this acid by crystallization.

Finally it was found that with mercury acetate in presence of acetic acid and methyl alcohol the percentage of saturated fatty acids could be reduced to less than 0.5%. Having studied the effect of quantity of these reagents, the following method to remove saturated fatty acids from crude oleic acid was obtained.

Oleic acid, 100 grammes, was heated in a water bath with 175 grammes of mercuric oleate, 140 cubic centimeters of methyl alcohol and 45 of glacial acetic acid. The mixture is then cooled and let rest for 24 hours, at the end of which it is filtered with a pump. The filtrate is treated with 50 cubic centimeters of hydrochloric acid (density 1.19) to split the complex products and after dilution it is briskly agitated with petroleum ether. The extract is washed with water and filtered. The petroleum ether is distilled in a water-bath and the residue saponified in the usual way. The soapy solution is agitated with petroleum ether to free it from non-saponifiable matter, and after adding diluted sulphuric acid the oleic acid is extracted with petroleum ether, the extract washed and the solvent distilled. Thus oleic acid, containing only 0.4 to 0.5% saturated fatty acids is obtained. This oleic acid, however, has a certain amount of acids with a greater degree of saturation (linoleic acid, etc.). It can be freed from these compounds also by crystallization cold in acetone as follows:—The oleic acid is dissolved in pure acetone, *viz.*, distilled on potassium permanganate and dried with anhydrous sodium sulphate, the solution being refrigerated at —10°C. to —15°C. in a mixture of alcohol and carbonic snow in a Dewar receptacle. After crystallization it is filtered through a funnel with double sides refrigerated with alcohol and carbonic snow. Care must be taken to cover the funnel with a sheet of glass to keep away moisture.

Repeating crystallization in this way a practically pure oleic acid is obtained.

The British Soap Manufacturer.

An investigation of the effect of various gases upon the yield in glycerine synthesis has shown that yields comparable with those obtained under atmospheric pressure may be had using SO_2,CO_2, N, and HCl, all under reduced pressure. *J. Soc. Chem. Ind.* 278-80T (1928).

New Books

The Fundamentals of Quantitative Analysis by Walter C. Blasdale, Ph.D., Professor of Chemistry in University of California, Los Angeles. Published by D. Van Nostrand Co., Inc., New York. 400 pages. Binding, black cloth. Third Edition, revised and partially rewritten. As a standard text on quantitative analysis, it presents the theoretical and practical features of a series of exercises in quantitative analysis, together with questions and problems on the text. The essential features of the original edition are unchanged, but two-thirds of the chapters have been re-written, the name of the book has been changed, and the group of questions and problems has been expanded.

Industrial Carbon by C. L. Mantell, Ph.D., Pratt Institute, Brooklyn. Published by D. Van Nostrand Co., Inc., New York. 400 pages. Binding, black cloth. Of especial interest to producers and refiners of oils and fats are the two chapters, totaling fifty pages, devoted to vegetable decolorizing carbon and carbon specialties. The book is a very thorough-going short survey of the uses to which carbon is put in the industrial world, and prepares the way for further literature on that important subject.