ABSTRACTS

Oils and Fats

Edited by
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Bleaching of Palm Oil. C. D. V. Georgi and G. L. Teik, *Malay Agricultural Journal*, 1933, 21, 23-32.—By blowing with air at about 90° in the presence of 0.01% of metallic catalysts (cf. Sastry, B., 1916, 126) palm oil (4% of free fatty acids) could be bleached in 1½ hour with Co resinate, in 2½ hours with the Co borate (insoluble in the oil), and in 7-9 and 12-13 hours, respectively, with the corresponding Mn and Ni salts. The solid and liquid fractions of the oil (separated by filtration) could also be bleached separately. The filtered air-bleached oil could be deacidified and deodorized for local use as an edible oil or for soap manufacture.—British Chemical Abstracts (The American Perfumer, 28, 9, 485, November, 1933).

Maleic Acid and Phthalic Anhydride. C. R. Downs, Weiss and Downs, Inc., *New York Industrial and Engineering Chemistry*, Vol. 26, No. 1, page 17, January, 1934.—Greenback (U. S. 1,898,363) of the United States Department of Agriculture has found that maleic acid is an important antioxidant for preventing the development of rancidity in fats and oils in storage. The addition of only one part of maleic acid in ten thousand parts of the fatty material has been found effective. It is well known that crude vegetable oils keep remarkably well. After refining by the alkali process, the excellent keeping quality is destroyed. The natural antioxidants of these crude oils have never been isolated. It was found that certain water-soluble extracts from cottonseed and soybean meal were antioxidants for dairy products. The only property recorded for this fraction was that it was slightly acidic.

In a study of the aliphatic acids it was discovered that the structure of maleic acid was similar to hydroquinone. Maleic acid has practically the same antioxygenic value as hydroquinone when used in fats and oils. It is ideal in that its solubility in fats and oils is only 0.01 per cent which simplifies its use, since excess acid may be added to the oil and the excess removed by filtration. It adds no taste, odor, or color to the product. It has also been found to inhibit the development of rancidity in milk powder, pasttry, and carmels.

Although the Bureau of Dairy Industry has not formally recommended its use, it would seem that the economic importance of this discovery should lead to its wide application. For a purpose of this sort the question of the toxicity of maleic acid is occasionally raised. This is approximately equivalent to oxalic acid, but in the extremely small traces required for this purpose it would appear that it could be used with safety. There are, of course. large tonnages of fatty oils used which are not converted into edible products.

As a matter of scientific interest only, it should be noted that maleic acid at times crystallizes in the form of prismatic blue crystals. As far as the author knows, this has never been reported nor its cause determined.

Examination of the fatty acids separated from soaps. G. Wolff. *Chimie & Industrie* Special No., 1039-42 (June, 1933).—Attention is drawn to the complexity of the problem of detg. the nature and amts. of fats used in the manuf. of soaps made from several different fats. Emphasis is laid on the value of the titer test, the value of which, however, is not proportional to those of the materials used. Curves are given showing the variation in the titer test of various mixts. of peanut, copra, tallow, stearic acid, palm oil, horse fat, soy-bean oil, linseed oil and rosin.

A. Papineau-Couture.

Taffel and Revis method for estimating the rancidity of oils and fats. J. K. Giles. *Chemistry and Industry*, 1933, 816-17.—The method of T. and R. (*C. A.* 25, 2315) is revised as follows: Through a 2-oz. bottle contg. 40 ml. of glacial AcOH kept in H_2O at 95-100°, pass a stream of CO_2 for 2 min. Next add 2 ml. of 50% KI with the CO_2 still on, and after 1 min. pour in a weighed amt. of liquid fat (approx. 10 ml.) and obtain the wt. by reweighing the cylinder. Pass the CO_2 for 4 min. and then pour the bottle contents into 150 ml. of H_2O and titrate with 0.02 *N* $Na_2S_2O_3$ with starch soln. as indicator. Make a blank detn.

E. Scherubel.

Determination of the hydroxyl number. W. Normann and E. Schildknecht. *Fettchem. Umschau* 40, 194-7 (1933).—The following modification of the Verley-Bölsing method for acetyl no. has been developed by N. and S.: Into a 150-cc. flask weigh enough substance to use up only ⅕ of the Ac_2O to be added, and from a pipet weigh 4 cc. of a fresh mixt. of 1 vol. Ac_2O and 2 vols. pyridine. Cover the flask with a funnel and immerse it 1 cm. for 1 hr. in boiling H_2O. Cool, rinse the funnel with 0.5-1.0 cc. H_2O; cool again if heat is liberated, dil. with neutral alc. and titrate back with 0.5 *N* alc. KOH and phenolphthalein; run a blank. Then: hydroxyl no. $= [(b - a)28.055/e] + A$, where $a =$ cc. 0.5 *N* KOH, $b =$ cc. used in blank, $e =$ wt. of substance and $A =$ any free acid no. the substance may have had. There is also described a method for the detn. of alcs. whose esters are volatile in mixts. of fatty acids and neutral fats. P. E.

Relationship between the antimony trichloride blue value of cod-liver oils and that of their unsaponifiable fractions. F. J. Dyer. *Quart. J. Pharm. Pharmacol.* 6, 338-46 (1933).—Thirty-nine samples of liver oil were tested by $SbCl_3$ reagent both for the blue value of the oil (x) and of the unsaponifiable fraction (y). For this series it has been shown that the blue value of the unsaponifiable fraction is 161.5% of that of the blue value of the oil itself. By math. analysis, the curve of distribution of the values of $\log y - \log x$ has been shown to be almost normal, to possess only a slight degree of "skewness" and to be of normal height. In practice this means that the likelihood of the blue value of the unsaponifiable matter prepd. by the rapid method of Smith and Hazley, being 161.5% of that of the blue value of the oil, is equal for oils of high and low blue values. A simple calcn. has been made of the degree of inaccuracy that is unavoidable in making a detn. of the blue value of an oil direct, rather than on the unsaponifiable matter. A worker must decide whether this degree of inaccuracy is so great as to make it worth while to carry out the test on the unsaponifiable matter. W. O. E.

Notes on extraction plants for oil seeds. Herrmann Meyer. *Chem. App.* 20, 94-5, 103-5 (1933).—The flow sheet and details of construction for extn. plants are discussed. Summarized data for properties of oils and suitable solvents are presented.

Karl Kammermeyer.

Calculation of a refining plant for seed oils. Herrmann Meyer. *Chem. App.* 20, 113-17 (1933); cf. preceding abstr.—Calcns. for the various steps in a refining plant processing 3,000 kg. cottonseed oil per 12 hrs. are carried out for heat and material requirements. A table is presented which gives values for the mean temp. difference as functions of the terminal differences, in heating equipment. Karl Kammermeyer.

Unsaturated fatty acids of the oleic series in Japanese sardine oil. Masakichi Takano. *J. Soc. Chem. Ind., Japan* 36, Suppl. binding 549-50 (1933).—The mixed fatty acids from the sapon. of oil were sepd. by the Na and Pb salts-acetone methods. The liquid fatty acids were converted into their Me esters and fractionated by vacuum distn. The acids identified were (1) zoömaric acid, (2) oleic acid (probably normal), (3) gadoleic acid, and (4) cetoleic acid. Acids (1) and (2) constitute 20-30% of the total mixed fatty acids. Five references. K. K.

The detection of the adulteration of cacao butter. Determination of the azelaic acid number. G. Schuster. *Compt. rend.* 197, 760-2 (1933); cf. *C. A.* 27, 1955.—The azelaic acid no. is defined as the no. of mg. KOH required to neutralize the acidity of 1 g. of the mixed insol. acid glycerides obtained by $KMnO_4$ oxidation of the fat. Direct detn. of this const. by sepn. of the glycerides and acidimetric titration is a delicate operation on account of the difficulty of eliminating pelargonic acid which is but slightly sol. in H_2O. The following technic, which makes use of the considerable difference in soly. of the Mg salts of pelargonic acid and of azelaic esters in 80% alc., is recommended: Oxidize 40 g. cacao butter dissolved in 400 cc. Me_2CO with 160 g. $KMnO_4$; dissolve the mixed acids in 350 cc. 80% alc.; to the hot soln. (70-80°) add a hot soln. of 6 g. anhyd. $MgCl_2$ in 60 cc. 80% alc.; let stand 24 hrs. at 15°, filter, wash with 100 cc. 95% alc. and then with distd. water, dry in vacuum over H_2SO_4; in 1 g. of the Mg salts det. Mg as $MgSO_4$ and calc. therefrom the equiv. KOH. Cacao butter has an azelaic acid no. of 98.7; Karite butter, 131.1. In mixts. of the 2, the compn. can be calcd. from the azelaic acid no.; in more complex mixts., it can detect adulteration. A. Papineau-Couture.

Report on (the analysis of) fats and oils. Geo. S. Jamieson. *J. Assoc. Official Agr. Chem.* 16, 568-9 (1933).; cf. *C. A.* 27, 200-1. —Detn. of the acidity and sapon. no. of extd. cottonseed oil gives higher results by the Albert method than by the present official A. O. A. C. method. A. Papineau-Couture.

The oil production from sunflowers and its economic significance for Germany. K. Riccius. *Fettchem. Umschau* 40, 201-4 (1933).—A plea for introducing sunflower cultivation in Germany.

P. Escher.

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