Abstracts

Oils and Fats

Edited by
M. M. PISKUR

Diphenylcarbazid as a reagent for judging the rancidity of fatty oils. A. Schramme and R. Neu. *Fette u. Seifen 47,* 447-8 (1940). Various modifications of the reaction were investigated with fresh and old refined soybean oils, refined rape oil, molecularly distd. soybean oil and iron-free soybean oil. The tests did not parallel the Stamm reaction. The tests were not consistent with other rancidity tests or the state of the oil. It was therefore considered unusable for food fats.

A proposed modification of Emmerie's iron-dipyridyl method for determining the tocopherol content of oils. W. E. Parker and W. D. McFarlane. *Can. J. Res. Sec. A. & B. 18,* 405-9 (1940). By treating a petrol ether soln. of wheat-germ oil with 85% sulfuric acid, centrifuging, and washing the supernatant petrol ether with dilute alkali, carotenoids and other substances that interfere with the iron-dipyridyl method for detg. tocopherol are removed. Tocopherol is not affected by the treatment. The tocopherol content of the soln. is finally detd. by a modification of Emmerie's method.

Adsorption separation in the fat field. IV. The separation of glycerides by adsorption. H. P. Kaufmann. *Fette u. Seifen 47,* 460-2 (1940). Tributyrin and trimyristin are more strongly adsorbed by adsorbing agents than tristearin. The lower mol. wt. acid of cocoa fat and palmkernal fat were more strongly adsorbed than those of high mol. wt. Monostearin is more highly adsorbed than tristearin; distearin is intermediate. It was pointed out that a mixt. of mono, di and tristearin can be sepd. into its components. Cocoa butter was esterified with glycerin to a (OH) no. of 204.5. This was adsorptively fractionated into 7 fractions whose (OH) values varied from 25.6 to 322.4.

Segregation of high- and low-titer fatty acids. R. J. De Gray and A. W. DeMoise. *Ind. & Eng. Chem., Anal. Ed. 13,* 22-4 (1941). A routine method for the segregation of the high- and low-titer components of mixed fatty acids is described, which requires approx. 1 hr. and seps. the 2 fractions with at least 95% accuracy. A second sepn. may increase this to 99% or better. The method may be applied to fats themselves, giving an indication of the distribution of the acid mol. on the glycerol residue, and permitting identification of the free fatty acids present in a fat.

Antioxygenic fractions of oat and soya bean flour. C. D. Dahle and D. H. Nelson. *J. Dairy Sci. 24,* 29-39 (1941). An attempt was made to det. the active fraction of 2 antioxidants, oat flour and soya bean flour, with only partial success. The phospholipid fraction and an alc. extract exhibited greater antioxygenic properties in dry fresh milk fat than did either the aq. acetone, ether or hexane exts. In every case the oat flour exts. appeared to have greater protective powers in dry fresh milk fat than the corresponding ext. of soya bean flour.

Queer behavior of antioxidants. Autoxidation of sunflower seed oil. C. G. Macarovici. *Bull. de la section scientifique academie roumaine 22,* 496 (1940). Oat flakes are proöxygenic in sunflower seed oil although in most other edible oils they effectively prevent rancidity. *Food Ind.*

Estimation of gossypol in crude cottonseed oil. J. O. Halverson and F. H. Smith. *Ind. & Eng. Chem. Anal. Ed. 13,* 48-8 (1941). A clear-cut method for the estn. of gossypol in crude cottonseed oil is presented, with modifications which permit sets of ten detns. to be made fairly expeditiously. Precipitation is expedited by increased temps., by the addn. of gossypol in an ether-extd. oil prepd. from cottonseed meats, and by constant agitation which ppta. the gossypol in a good crystn. condition for rapid filtration and washing without appreciable loss due to dissolving. Soly. is prevented by the use of pyridine in the wash soln. The gossypol compd. is prevented from adhering to the glass container by elimination of practically all water. Recovery of added gossypol and the reproducibility of results are good.

Methyl esters of the higher fatty acids. F. W. Wyman and C. Barkenbus. *Ind. & Eng. Chem. Anal. Ed.* 12, 658-61 (1940). The methyl esters of caprylic, capric, lauric, myristic, palmitic, and stearic acids have been purified and their *n* detd. Small quantities of known mixts. of these esters have been fractionally distd. through a spinning-band column and their compn. has been detd. With the exception of the more volatile esters the analyses are fairly accurate, considering the difficulty connected with sepg. such mixts. In oil analyses where only small quantities of these acids are available this method offers for the first time a convenient and fairly accurate method of analysis.

The examination of lard. R. W. Sutton et al. *Analyst 65,* 623-36 (1940). The characteristics, properties, changes in and methods of detecting adulteration of lard are thoroughly reviewed. The limitations of the Kerr (A.O.A.C.) and the Bömer test were detd. If the details specified by the A.O.A.C. are closely followed, a Bömer value of 70 indicates the presence of between 5 and 15% of the beef fat and a value of 65 indicates between 15 and 40%. Test for hydrogenated fats depends on iso-oleic acid detn. Microscopic examn. of crystal tests are evaluated.

Contributions to the study of marine products. VI. The occurrence of cetyl palmitate in corals. D. Lester and W. Bergmann. *J. Org. Chem. 6,* 120-2 (1941). The staghorn coral, Madrepora cervicornis, contains between 0.25 and 0.5% of cetyl palmitate.

The phosphorus and iodine contents of British Columbia fish oils. R. D. Heddie and J. S. Brawn. *Can. J. Res. Sec. A. & B. 18,* 386-7 (1940). The amts. of P and I in various Brit. Columbia fish oils have been detd. It has been found that the concn. of P in the various fish oils is too low to exert much of an antioxidant effect, that samples of fish oil from different localities differ widely in the I content, and that fish oils are a relatively high source of I.

Synthetic glycerine from petroleum. E. C. Williams and associates. *Chem. & Met. 47,* 834-8 (1940).

Determination of glycerol by oxidation with ceric sulphate in fermentation media containing dextrose. *Ind. & Eng. Chem. Anal. Ed. 12,* 729-30 (1940). The present communication gives details of a simple and rapid method for the detn. of glycerol, in

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the presence of dextrose, which is applicable to a fermented medium. The procedure involves the detn. of the sugar by a Cu titration method, followed by the oxidation of another sample with ceric sulfate under standardized conditions. Both the sugar and the glycerol are oxidized, but from a correction for the ceric sulfate used by the sugar, the glycerol is calcd. by means of suitable equations or read from a graph.

Determination of gossypol in crude cottonseed oil. H. D. Royce, et al. *Ind. & Eng. Chem. Anal. Ed. 1,* 741-44 (1940). A mixt. of pyridine and aniline is more effective than aniline alone in pptg. gossypol from crude cottonseed oil. A modification of the pyridine-aniline method, which recovers up to 98% of gossypol from a 0.2% soln. in oil, is described.

Free fatty acids and rancidity in relation to animal by-product protein concentrates. R. E. Gray and H. E. Robinson. *Poultry Sci. 20,* 36-41 (1941). A high free fatty acid content of the fat in animal protein concentrates is not a true factor for the evaluation of the nutritive worth of such products when used in well-balanced rations for poultry feeding. High rancidity of the fat in animal protein concentrates does not necessarily greatly affect the nutritive value of such products when used at a 10 to 15% level in poultry feeds.

The effect of cottonseed oil in the hatchability of eggs. R. C. Ringrose, et al. *Poultry Sci. 20,* 57-61 (1941). The addn. of crude cottonseed oil to a satisfactory ration for laying hens markedly reduced the hatchability of the eggs produced. Cottonseed oil at a level of 3.6% of the ration reduced hatchability from approx. 80% to less than 30%. Wesson oil and crude soybean oil fed at a level of 3.6% and crude peanut oil at a level of 7% did not affect hatchability. The sapon. fraction of the crude cottonseed oil contd. the factor(s) but the non-sapon. fraction had no effect upon hatchability. The distillable ethyl esters of the fatty acids of cottonseed oil did not affect hatchability. Neither oxidation of the cottonseed oil nor heating for 2 hrs. at 175° C. destroyed the factor(s). Rancidity of the oil was not a factor affecting hatchability. Refining the crude oil by filtering and alkali treatment did not destroy the factor(s) affecting hatchability. Hydrogenation of both the filtered crude cottonseed oil and the refined oil completely destroyed the active factor(s). Neither addns. of vitamins A, D and E, nor dried pork liver to the rations contg. crude cottonseed oil improved hatchability.

Intermediary metabolism in diabetes mellitus on the synthesis of carbohydrate from fat in the liver and from acetoacetate in the kidney. W. C. Stadie, et al. *J. Biol. Chem. 137,* 63-74 (1941). The evidence is against the hypothesis that fatty acids are converted into carbohydrates by the diabetic liver. The non-formation of acetic acid and the ratio of ketone body increase to fatty acid decrease in livers of diabetic animals. W. C. Stadie, et al. Ibid. 75-87. In similar slices from depancreatized cats and phlorhizinized rats and cats the ratio of ketone body increase to fatty acid decrease was found to be 3.3 ± 0.7. The significance of this with respect to fatty acid catabolism of the liver is discussed.

The effect of fat on tumor formation. H. P. Jacobi and C. A. Baumann. *Am. J. Cancer 39,* 338-42 (1940). The rate of tumor production by local application of benzopyrene, methylcholanthrene or dibenzæthracene to mice was accelerated by addn. of 15% fat to the diet. Fat applied locally to the painted areas has less effect than fat in the diet. (*Chem. Abs.*)

PATENTS

Solvent extraction of oxygenated production. F. J. Ewing (Union Oil Co.). *U. S. 2,222,215.* Propane is used as a solvent for fractionating oxidized hydrocarbons by extn.

Apparatus for continuous extraction of oil from seed. H. Süss (Maschinen- und Metallwaren-Handelsgesellschaft m.b.H.). *U. S. 2,223,747.* A countercurrent seed oil extn. app. is described. A special feature is the freedom of any interior mechanical devices, thru simplifying the app. and mode of operation.

Shortening and process of producing the same. T. M. Godfrey and V. Serbell (Lever Bros.). *U. S. 2,223,724.* Highly stable shortening is prepd. by steaming and subjecting to vacuum to remove O_2, in the congealing process N_2 is added while the shortening is kept from contact with air and even after packaging the space in the container not occupied is filled with N_2.

Process of refining vegetable oils. H. M. Duvall (Refining, Inc.). *U. S. 2,225,557.* The process of refining animal and vegetable oils contg. gums comprises treating said oil to remove major portion of the gums therefrom to form a degummed oil, adding an amt. of the original undegummed oil to said degummed oil sufficient to bring the amt. of gums in the resultant oil to a predetermined min. amt. which will cause effective sepn. of soap stock from neutral oil in subsequent alkali refining, and thereafter subjecting said oil to alkali refining. Phosphatide and other minor constituents are recovered in the degumming process.

Process of refining glyceride oils. B. H. Thurman (Refining, Inc.). *U. S. 2,225,575.* In the process of alkali refining degummed oils in which the soap stock is sepd. from refined oil by difference in sp. gr., the improvement comprises performing said sepn. in the presence of an added emulsifying agent in an amt. which will prevent stratification of the soap stock into soap and nigre without substantially increasing the entrainment of oil in the soap stock.

Process for refining and obtaining valuable products from tall oil. F. H. Gayer and C. E. Fawkes (Continental Res. Corp.). *U. S. 2,223,850.* The process of refining crude tall oil comprises treating tall oil at a temp. of approx. 30° C. with sulfuric acid in a quantity and of a strength sufficient to precipitate only the coloring matter and the phytosterol therefrom.

Therapeutic composition. K. C. Hickman (Distillation Products, Inc.). *U. S. 2,221,690.* A therapeutic preparation comprising a high vacuum distillate of oil in association with a concn. of fat sol. vitamin obtained by the high vacuum distn. of a fish oil is presented.

Process and apparatus for determining the hardness of semisolid fats. M. Krüger. *Ger. 686,420*

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Cl. 42L. Fette u. Seifen 47, 465 (1940). The app. is arranged to record the pressure exerted in cutting a sample of butter or margarin with one or more cutters.

Comestible. A. S. Schultz and C. N. Frey (Standard Brands, Inc.). *U. S. 2,223,465.* Yeast is stabilized and improved in regard to cutting qualities and color by incorporating a lauric acid partial ester of a polyhydric alc.

Treatment of fatty compositions and product. G. D. Martin (Monsanto Chem. Co.). *U. S. 2,225,124.* An oxidizable fatty material stabilized against the development of color and rancidity by having incorporated therein a small amt. of an N-aryl thiourethane or N alicylic thiourethane is described.

Process of obtaining sterol glucosides and sterols from fatty substances. H. R. Kraybill and M. H. Thornton (Purdue Res. Foundation). *U. S. 2,225,375.* The process of obtaining sterols from a fatty substance which consists in sepg. it by selective adsorption into a portion which contains phosphatides and mucilages and a portion which contains sterols but is substantially free from phosphatides and micilages, extracting the second portion with organic sterol-dissolving solvent which when cold is substantially immiscible with the oil, and sepg. the sterols from the solvent, is described.

Process for the manufacture of drying oils. R. Priester (Naamlooze Vennootschap Industrieele Maatschappij Voorheen Noury & Van Der Lande. *U. S. 2,226,830.* Hydroxyl groups are split from castor oil by heat treatment with persulfuric acid compds. *U. S. 2,226,831.* Castor oil is dehydrated and then treated with alc. to esterify the free acid formed in the dehydrating process and that formed in the heat bodying of the oil.

Waxing and polishing composition. W. O. Pool and J. Harwood (Armour and Co.). *U. S. 2,225,392.* A waxing and polishing compn. contg. as a waxing constituent an N-alkyl phthalimide in which the alkyl group is a fat acid contg. at least 5 C atoms.

Zirconium salts of water-insoluble fatty acids and method of making same. C. J. Kinzie and E. Wainer (Titanium Alloy Mfg. Co.). *U. S. 2,221,975.* In the production of zirconium salt of a water-insol. fatty acid, the step which consists in mixing an aq. sapond. soln. of said acid with a water-sol. inorg. salt of zirconium in the ration of 1 mol of ZrO_2 to 2 mols of said acid at temps. between 50° C. and 75° C. is described. The products are used for producing opalescent or flat finish in fibers, films, varnishes, paints, lacquers, and the like.

Soluble cutting oil and method of preparing the same. P. T. Anderson and H. L. Moir (Pure Oil Co.). *U.S. 2,211,250.* The oil contains a mineral oil and a minor portion of fatty material which has been sulfurized and then phosphorized.

Abstracts

Soaps

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M. L. SHEELY

Synthetic glycerin from petroleum. E. C. Williams, Shell Dev. Co. *Chem. Met. Eng. 47,* 834 (1940). Propylene is reacted with chlorine, resulting in direct attack of the methyl group with the consequent formation of allyl chloride—about 85% yield. Allyl chloride is hydrolyzed to allyl alcohol with sodium carbonate. Chlorine is added to aqueous allyl alcohol. The resulting solution is neutralized and then hydrolyzed with sodium bicarbonate. Glycerine is recovered by neutralizing the hydrolysate, condensing, filtering, and finally vacuum distilling the glycerin.

Wetting agents, their structure, characteristics and uses. C. A. Sluhan. *Am. Dyestuff Reptr. 30,* 1-4, 18-20 (1941). The author deals with the general subject of surface active chemicals as applied to wetting, dispersing, and detergency. It is pointed out that these operations are distinct and sep., although detergency does involve wetting, and dispersing action. It is shown that wetting agents differ in mol. configuration from detergent type products or dispersing agents. The structure of the mol. with its attendant effect on wetting power, soly., and foaming is also discussed. Comparison is made of anion and cation surface active chemicals and a number of applications in various industries is cited. The importance of selecting the proper type of surface active chemical for applications of wetting, dispersing, or detergency is emphasized.

Surface active agents in the degumming of silk hosiery. O. Morgan and H. Seyferth. *Dyestuffs 36,* 188 (1940). The present hosiery degumming tests have shown that the amount of soap to be used for best results is rather critical. The addition of alkali to soap adversely affects the handle and the elasticity of the hosiery. The use of alkali alone is not feasible since there is not enough dispersing ability in the system to render the insoluble scums free rinsing and dyeing and finishing troubles are encountered. With a degumming oil a poor hand is obtained as well as poor dyestuff efficiency. When handle appearance, dyestuff efficiency, elasticity, endurability and cost are all considered it becomes very obvious that the present work with surface active agents and suitable alkalies has revealed a desirable and economical method of degumming silk.

Following their examination of the hosiery discussed in this paper, the United States Testing Company arrived at the following conclusions: "From the results of our tests it is our opinion that the use of Nacconol with sodium silicate has definite advantages over the use of soap alone and soap and alkali in the degumming of silk hosiery, since it apparently produces the most satisfactory finished stocking and materially aids in the retaining of pliability and elasticity which are the prime requisites of silk stocking."