

ABSTRACTS

Oils and Fats

Edited by
W. F. BOLLENS and M. M. PISKUR

A new method for processing olives for [extraction of] oil. Chr. Kerkhoven. *Ole, Fette, Wachse, Seife, Kosmetik* 1936, No. 9, 7-8. K. claims that a better quality of olive oil is obtained with the solvent method of extn. if the olives are not dried before extn. By this method 2% of the oil remains in the residue. Details of the method are not presented. (*Chem. Abs.*)

Modern oil extracting [processes] and their bases. R. Heublum and H. Japhé. *Allgem. Oel- u. Fett-Ztg.* 32, 401-5, 447-52, 497, 502 (1935); *Ibid.* 33, 13-7, 49-55, 96-103, 141-9, 199-203, 254-61 (1936). Physical structure of seed, change in seed protein on cooking and effect of various factors (i. e., heat, moisture, pH, etc.) on extn. are reviewed. Bibl. of 109 references. (*Chem. Abs.*)

Diene synthesis in the fat field. I. The diene number of fats. H. P. Kaufmann and J. Baltes. *Fette und Seifen* 43, 93-7 (1936). Several earlier investigators have shown that certain compds. form addition products with organic compds. contg. conjugated double bonds. This led to the investigation for devising a method for detg. conjugated double bonds in fat acids and hence a new characteristic which aids in the identification of fat acids and structure of fat acids. Maleic acid anhydride was chosen as a suitable reagent. The reaction was found quant. in tests on anthracene. The "diene no." of fat is described as the amt. of maleic acid anhydride, calcd. in equiv. amts. of I that reacts with 100 parts of fat. Tests on isomers of linoleic acid gave diene nos.: 91.1, 89.9 and 91.3. The theoretical value for this acid is 90.6. Method of analysis: 0.1—0.15 g. fat acid or fat is placed in 12 mm. long and 6.5 mm. dia. glass rod which is sealed at one end. This is placed in a 20 cc. ampoule of about 10 cm. length. 10 cc. of maleic acid anhydride soln. (10 g. to 1 L. of pure acetone) are added and the ampoule sealed. The ampoule is placed in a thermostatic controlled oil bath and heated 20 hrs. at 100°, cooled, opened and contents poured and washed into 80-100 cc. of CO₂ free water in a 250 cc. erlenmeyer flask. Add 2 g. of NaCl, stir, let stand 6-8 hrs., filter and wash out flask and filter paper. Titrate with N/10 NaOH using 1% phenolphthalein in acetone as an indicator. Calc. with formula: $D. no. = 1.269 (a - b)$.

e

e = wt. of fat, a = cc N/10 NaOH used for blank, and b = same for sample.

A colorimetric method for the detection of tea seed oil in olive oil. J. Filtenson. *J. Assoc. Off. Ag. Chemist* 19, 493-7 (1936). To a test tube add 0.8 cc. Ac-anhydride, 1.5 cc. CHCl₃ and 0.2 cc. H₂SO₄. Mix and cool to room temp. Add 7 drops of oil sample, mix and cool. If soln. is cloudy, add Ac-anhydride dropwise with shaking until clear soln. forms. Let stand at room temp. 5 min. and then note color. Tea seed oil exhibits a deep green by reflected light and brown by transmitted light. Olive oil will show a green color by reflected and transmitted light. Add 10 cc. of anhydrous ethyl ether and mix immediately. Tea seed oil will show a brown color changing to an intense red within about 1 min.; on further standing this color fades. Olive oil forms an initial green which

fades to a brown-gray, occasionally passing through a slight pink stage. Mixts. of tea seed and olive oils exhibit the characteristic tea seed oil colors proportional in intensity to the quantity of tea seed oil present.

Application of the thiocyanogen value to the determination by Kaufmann's method of oleic and linoleic acids in natural oils which are free from linolenic acid. S. K. Sharma. (*J. Indian Chem. Soc.* 1936, 13, 151-154). Errors in the method of calculation of the % of linoleic and oleic acids in various Indian oils on the basis of their SCN and I vals. by Godbole et al. and Varma et al. are established and the correct vals. are calc. (*Brit. Chem. Abs.*)

Report on the hydroxyl number and acetyl value of fats and oils. W. L. Roberts. *J. Assoc. Off. Ag. Chemists* 19, 420-7 (1936). André-Cook method shows poor agreement with normal samples and is inaccurate on samples containing volatile-sol. or volatile insol. fat acids. Roberts-Schuette method is the simplest method of the three tested; collaborators obtained suitable individual checks and individuals check with each other. The West-Hoagland-Curtis method gives suitable duplicate checks with individuals, but the individuals do not check each other.

Determination of the hydroxy number of hydroxy fatty acids. K. Hinsberg. *Biochem. Z.* 285, 125-9 (1936). The detn. is carried out in a special app. consisting of 2 small vessels, A and B, connected by an L-shaped tube. The acetylation is made with 5 N Ac₂O in dry C₅H₅N, and the AcOH set free is collected in 2.5 N KOH. Measure exactly 4.0 cc. 2.5 N KOH into vessel B. Stopper the vessels tightly and evacuate to 20 mm. Hg. Measure 2 cc. of the acetylation soln. accurately into vessel A through a buret fused into the hollow glass stopper also provided with a side tubulation. Allow the soln. to run in slowly and wash twice with 0.5 cc. C₅H₅N. Place vessel A in a bath at 100° and keep vessel B at 15°; in 30-40 min. Ac₂O and AcOH distil over into the KOH soln. Determine the remaining KOH by titration with N HCl. A blank detn. must also be made, the difference between the 2 being used in the calcn. Acetylate a weighed amt. of the hydroxy acid with 20 cc. of the Ac₂O-C₅H₅N reagent for 7 hrs. over a water bath. Make up the vol. to 25 cc. with C₅H₅N, and use 2 cc. for the distn. One cc. of N KOH = 56.12 mg. KOH. (*Chem. Abs.*)

Analysis of ester mixtures that contain two saturated and two unsaturated fat acids. T. P. Hilditch. *Fette und Seifen* 43, 97-100 (1936). A scheme with mathematical equation is presented for detg. percentage fat acids. The method is based on separation of liquid from solid acids by a modified Twitchell procedure, prepg. the methyl esters, fractionating and analyzing the fractions.

Cooling curves of oils, fats, natural and hardened (hydrogenated) waxes and paraffins. I. The cooling curves of fats, natural solid waxes and similar substances. Sei-ichi Ueno and Shin-ichi Nakaguchi. *J. Soc. Chem. Ind., Japan* 39, Suppl. binding 79-82 (1936) (in French).—Hydrogenation of the substances was carried out for 2-4 hrs., at a pressure of 50 atm. and 180°, with a Ni catalyst. Except for wood

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and sesame oil, which had an I no. slightly greater than 3, all samples had I nos. less than 3. The cooling curves were obtained by heating the samples somewhat more than 10° above the solidification point, agitating them while cooling to within 10° of this point, and then continuing cooling without stirring. Cooling curves (time vs. temp.) are presented for 29 substances (16 hardened and 13 natural). In general, a remarkable temp. elevation was observed after superfusion for each hardened oil and fat. Only hardened sardine and herring oil showed a weak, though definite, temp. rise. However, all kinds of solid waxes and paraffin did not show any temp. rise. With hardened wax a small rise was observed, but that was probably due to the presence of glyceride. (*Chem. Abs.*)

Testing of butter and margarine fat for food control. J. Grossfeld. *Fette und Seifen* 43, 100-3 (1936). Review.

Surface tension of medicinal and edible oils. E. Canals and E. Flous. *J. pharm. chim.* 22, 151-4 (1935); cf. *C. A.* 29, 2377ⁿ.—With temps. of 15-45° as abscissae and surface tensions obtained by the DuNouy method as ordinates, parallel straight lines sloping toward the higher temp. were obtained for pure triolein, admixts. with 1, 10 and 50% oleic acid, and for 100% oleic acid. Surface tension (*f*) decreases with increase of oleic acid. At 15°, *f* = 36.08 dynes/cm. for triolein, 35.44 dynes/cm. for oleic acid; at 25°, the 2 values are, resp., 35.25 and 34.60 dynes/cm. When a 50% mixt. of triolein and oleic acid is washed free of the latter by the 1908 Codex method, the line of the purified triolein will coincide with that of the pure substance. (*Chem. Abs.*)

Blood phospholipid as a transport mechanism. Robert G. Sinclair. *J. Biol. Chem.* 115, 211-220 (1936). When elaidin is fed to cats, elaidic acid is found in very considerable amounts in the phospholipids of the blood plasma within a few hours. If elaidin is fed repeatedly for several days, as high as 37 per cent of the fatty acids in the plasma phospholipid consists of elaidic acid. Plasma phospholipid definitely serves as a mechanism for the transport of fatty acids to the tissues where they are burned.

Influence of cod liver oil on infected wounds. S. Hayashi. *J. Oriental Med.* 24, 65. Hayashi believes that the accelerated healing power of cod liver oil when applied to infected wounds is mainly due to the effect of vitamins A and D and the lipid contained in the oil. The effect should be attributed chiefly to the action of the lipid. The effect of vitamins, which has heretofore been regarded as the chief efficacious property, is not really as remarkable as that of lipid. The continuous application of cod liver oil for clinical treatment of wounds and bruises does not seem to cause any reactions. (*J. Am. Med. Assoc.*)

Hydrogenation with nickel carbonate without a carrier. I. Petryaev. *Mastoboino Zhirovoe Delo* 12, 145-6 (1936).—Freshly prepd. NiCO₃, dried at 100-5° and ground to 2800 mesh/sq. cm., was reduced in sunflower oil with H at 270-85° for 1 hr., and used in the hydrogenation of sunflower and hempseed oils at 240° for 30 min., giving fat mixts., m. 46-8° and 46-7.5°,

resp. A contact mass prepd. from Ni(CO₂H)₂ gave under these conditions equal results. The catalyst prepd. from unground NiCO₃ showed no contact effect. Equally good results in hydrogenation of the oils were obtained with the use of catalyst prepd. from NiCO₃ contg. 85-8% H₂O as above. (*Chem. Abs.*)

The composition of the acids of high molecular weight from the bitumen wax of peat. E. V. Roginskaya. *J. Applied Chem.* (U. S. S. R.) 9, 108-11 (in German 112) (1936).—Air-dried peat contg. 6.15% of bitumen extractable with PhH was used. The bitumen softened at 70-3°, had sapon. no. 158, acid no. 49.67, I no. (Hübl) 27.9. Extn. of 2 kg. of bitumen with alc. gave 53% of wax with softening temp. 76°. Soln. of the wax in an alc.-PhH mixt. and heating with KOH soln. for 8 hrs. on a water bath gave 40% of K soaps. The free acids were liberated with HCl, converted to the Me esters, the esters fractionated by distn., the fractions saponified with KOH and the soaps decompd. with HCl. The resulting acids were recrystd. from AcOEt and were then colorless and cryst. Extn. with petr. ether indicated the absence of hydroxy acids. Crystn. of the Mg salts from alc. soln. and analysis indicated the presence of C₂₉H₅₈O₂, C₂₈H₅₆O₂ and C₂₇H₅₄O₂. An unidentified acid of lower mol. wt. was also indicated. (*Chem. Abs.*)

Denaturing of plant and animal fats and oils. Jozef Endraszka. *Przemysl Chem.* 20, 1-14 (1936).—Each of 19 fats or oils was denatured with 1 to 5% of the denaturants, 25 of which were investigated, and then tests were made for the removal of the denaturant. The denatured material was heated on a water bath at about 100° with the addn. of 2-5% activated charcoal or infusorial earth and filtered hot. In no case was this a sufficient test. The removal of denaturant by steam preheated to 200° was very effective and sometimes changed the fat to edible condition. Of the many tried, only a few denaturants were found suitable; the others failed either because they discolored the fat, gave it an unpleasant odor or for other reasons. Of those found good, No. 9, consisting of 2 parts by wt. of pine tar and 1.5 parts of heavy naphtha used in a proportion of 2-2.5% by wt. of fat, and No. 16, consisting of 1:1 ratio of pine tar and soybean oil or even solid fat used in the proportion of 2% pine oil on the wt. of fat, are found suitable for fats destined for the making of soaps, and for similar purposes. For fats to be used for greases, No. 11, consisting of 0.5 part ol. animale foetidum and 9.5 parts tech. (tanner's) fish oil in the proportion of 1.5-2% by wt. of fat, is good. No. 20, 1.84 sp. gr. H₂SO₄ to the extent of 2% by wt. of fat is well suited for fats to be used in the textile industry. To make the tests conclusive, soaps were made up with fats treated with certain denaturants. Those made with denaturants No. 9 and 16 were as good as those made with undenatured fats. For this purpose denaturants consisting of pine tar in pyridine, naphtha or in rosin oil were either unsuitable or harmful to health. NaOH of any strength is not a good denaturant, because it can be removed too easily. Methods of prepg. the denaturants are given. The results of tests are tabulated. (*Chem. Abs.*)

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The splitting of fats by the autoclave process and the syntheses of some glycerides. Sei-ichi Ueno and Gentaro Inagaki. *J. Soc. Chem. Ind., Japan* 39, Suppl. binding 107-10 (1936).—Curves relating the time of splitting, with the acid no., pressure, percentage of splitting, percentage ash and Ac no. are given for sardine oil of various degrees of hardness. The autoclave (capacity 5 tons) was charged with 2 tons of the oil, 2 tons of H₂O, and small amts. of Zn powder and MgO. Small changes in steam pressure did not have as much effect as changes in tem. Some synthetic glycerides were prepd. by heating partially split fats with glycerol at 140-160°. (*Chem. Abs.*)

The synthesis of normal saturated fatty acids, alcohols and alkyl iodides of C₂₃, C₂₅, C₂₇ and C₂₉. Shichiro Shiina. *J. Soc. Chem. Ind., Japan* 39, Suppl. binding 180 (1936) (in German).—As starting material erucic acid was used, which was prepd. from rapeseed oil by the acid K-alc. method of Kimura (*C. A.* 24, 1999). The reaction scheme was: RCOOC₂H₅ → RCH₂OH → RCH₂I → RCH₂CN → RCH₂COOH → RCH₂COOC₂H₅, and with the malonic ester synthesis: R'I → R'CH(COOH)₂ → R'CH₂COOH. M. ps. are given for the fatty acids, Et esters and Me esters of the fatty acids, alcs. and alkyl iodides. (*Chem. Abs.*)

Distillation of fat acids according to the "Wecker process." E. M. Schonberger. *Fette u. Seifen*, 43 109-12 (1936). Flow sheet of apparatus and operating results are presented.

Information on stand oil formation. Johannes Scheiber. *Fette und Seifen* 43, 103-5 (1936). Polemical concerning the nature of the polymerization which leads to formation of stand. oils.

PATENTS

Salad oil and method of making same. D. P. Grettie. (Industrial Patent Corp.) U. S. 2,050,528. Aug. 11, 1936. Lecithin is added to winterized cottonseed oil to inhibit crystallization.

Apparatus for kneading of margarine and other edible fatty substances. A Gerstenberg, Copenhagen, Denmark. U. S. 2,050,654. Aug. 11, 1936. Structural features are described.

Elaidinizing oils, etc. N. V. Ned. Research Centrale. Fr. 794,529. Feb. 19, 1936. The transformation of oleic acid in oils, etc., to elaidic acid is carried out in the presence of com. Se or (and) Te or compds. of these with their natural impurities. The elements or their compds. are disseminated in or on a support. (*Chem. Abs.*)

Coloring material for food fats and oils. A. F. Files. U. S. 2,042,173. The coloring material for hard fat such as butter, oleomargarine and shortening fat consists of a mixt. of pulverized desiccated milk and a dye.

Bleaching oils, etc. Società industrie chimiche. Fr. 794,695. Feb. 22, 1936. Oils, glycerides, fat acids and resins from oleaginous seeds, olives or raisins are bleached by treating a soln. thereof in an org. solvent with bleaching clay, decolorizing charcoal or kieselguhr in the presence of small amts. of org. or inorg. acids or salts acting as catalyst, e.g., Al₂(SO₄)₃, H₂SO₄, H₃PO₄, HF, oxalic acid, sulfonic acids, Na₂CO₃,

BaCO₃, CaCO₃ or BaO (*Chem. Abs.*)

Method of refining vegetable oils. E. M. James. (Sharples Specialty Co.) U. S. 2,050,844. Aug. 11, 1936. The process involves caustic refining and washing with water in continuous manner by the use of centrifuges for separating oil from water and impurities.

Purification of oils. Leo D. Jones (to Sharples Specialty Co.) Can. 358,178. May 26, 1936. An oil and an acid are mixed to produce a sludge suspended in the oil and adapted to be sepd. by subsidence. The sludge suspension is impelled through a conduit to a battery of parallel centrifugal separators, and a part of the suspension is passed continuously through the conduit and returned to the mixing zone without passing to the subsidence sepg. zone. An app. is described. (*Chem. Abs.*)

Apparatus for treating oils and fats. W. Gen-secke. American Lurgi. Corp. U. S. 2,042,711. An app. for deodorizing oils and fats is described.

Refining of crude fats and fatty oils. E. W. Fawcett. Imperial Chem. Industries, Ltd. U. S. 2,047,196. The fats or oils are refined by the usual acid, alkali, or both refining processes and are then subjected to high vacuum distn. The materials distg. off at low temp. are part of the impurities while the triglycerides are distd. at the higher temp.; a small amt. of residue remains.

Process of producing edible fatty esters of synthetic origin. H. D. Royce. Southern Cotton Oil Co. U. S. 2,048,818. July 28, 1936. A mixt. of mono- and diglycerides prepd. by reaction of 5 parts of oil with 1 part of glycerol is refined with an acid process using phosphoric acid.

Separating fatty acids. A. W. Ralston, W. O. Pool and J. Harwood (Armour & Co.). U. S. 2,042,729. The process which includes converting a mixt. of a plurality of fat acids to a mixt. of nitriles corresponding to said fat acids, separating the nitriles by fractional distn. and converting the separated nitriles to corresponding fat acid.

Inhibitor for packaged products. S. Musher. Musher Foundation, Inc. U. S. 2,038,752. A flexible packaging material in sheet form having at its exposed surfaces an antioxidant selected from the group consisting of cereals and grains capable of protecting products in contact with its surfaces against oxidation.

Stabilization of animal and vegetable fats and oils. Carl S. Marvel. E. I. du Pont de Nemours & Company. U. S. 2,047,642, July 14, 1936. Fats and oils are stabilized by addns. of small amt. of an organic ester of tyrosine.

Light-filtering sheets for protecting oils, fats and waxes, etc., from light of wave lengths producing decomposition. Willard L. Morgan (to Sylvania Industrial Corp.). U. S. 2,043,860, June 9. For protecting oils, fats and waxes and their mixts. from rancidity, sheets of transparent regenerated cellulose are used which are colored with a substance such as various specified dyes in a concn. sufficient to render the sheet substantially transparent to light having a wave length other than 2900 to 4700 A., to which wave lengths it is substantially opaque, the sheet being of a yellow, orange or red color. (*Chem. Abs.*)