sulfonated oil containing fixed alkali salts, and, in the presence of ammonium salts, about 5% on the weight of the dry ammonium salt.

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ABSTRACTS

Oils and Fats

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

The Chemical Causes for Spoilage of Edible Fats. K. Taufel. *Z. Untersuch. Lebensm.* 72, 287-99 (1936). A review.

The Deterioration of Fat and Fat Structure by Heat and Light in Regard to Economy and Life. II. H. Schmalfuss, H. Werner and A. Gehrke. *Fette u. Seifen* **43**, 243-7 (1936). This is the second section of a paper reviewing deterioration of fats. Major part of the review summarizes the numerous publications of the authors.

Extraction Practice for Fat Containing Residues. Ilona Taussky. *Öle, Fette, Wachse, Seife, Kosmetik* 1936, No. 14, 1-2. In the extn. of oil from used bleaching earth or hydrogenated catalyst an optimum ratio of solvent to residue may be calcd. by experimenting. In tests 5000 l. of benzine were used in a rotary extractor for extn. of 2000, 1200 and 1000 kg., resp. of bleaching earth contg. 30% oil. Each 1000 kg. of original residue retained 500 l. of solvent. The solvent free residues after the first extn. contained resp., 7.9, 5.1 and 4.1% oil. A second extn. with the same amt. of solvent yielded residue, which when freed of solvent contained 1 to 1.4% oil. (*Chem. Abs.*)

Deacidifying Oils with Dilute Lyes. F. Wittka. *Allgem. Oel- u. Fett-Ztg.* 33, 563-9 (1936). Wittka recommends using 2-7° Be. caustic in the caustic refining process. Oils which in the treatment form an emulsion that will not break with the usual salt treatment must be treated (after emulsion is formed) with a small amount of sulfuric acid so that the foots can be separated and require a second deacidifying treatment. Fat acids are recovered from the dilute foots contg. also the washing, by acidifying with H_2SO_4. This process is claimed to be economical for valuable slightly acid oils. It is admitted that the use of more concd. lyes is simpler and cheaper and should be used for the poorer grades and cheaper oils. (*Chem. Abs.*)

Hazelnut Oil. S. H. Bertram. *Öle, Fette, Wachse, Seife, Kosmetik* 1936, No. 14, 2-4. Hazelnut (*Corylus avellana* L.) kernels yielded 54% oil on petroleum ether extn. The characteristics of the oil are d^{20} 0.9144 n_{28} 1.4691, I no. (Hanus) 86.8, sapon. 192.0 and unsaponifiable 0.35%. The oil contained 8.0% satd. acids (per Bertram oxidation method). The unsatd. acids were oleic 78.2 and linoleic 9.1. Efforts to det. solid acids by the Twitchell method yielded solid acids having high I nos. The unsatd. acids were sepd. from the residue and were proven by phys. characteristics of acid and the elaidinized product to be pure 9:10 oleic acid. There was no explanation for the abnormal behavior of the Twitchell detn. for solid acids. The m. p. of the linoleic tetrabromide indicated that the linoleic acid present was the ordinary 9:10, 12:13 linoleic acid. (*Chem. Abs.*)

Rancidity in Fats. I. The Effect of Low Temperatures, Sodium Chloride, and Fish Muscle on the Oxidation of Herring Oil. A. Bansk. *J. Soc. Chem. Ind.* **56** 13-15T (1937). The atmospheric oxidation of herring oil at —5° is fairly rapid, but at —20° and —28° it is very slow. Sodium chloride has no effect on the atmospheric oxidation of herring oil. Herring muscle seems to catalyse the oxidation of herring oil. This effect is destroyed by heat. The presence of sodium chloride increases this catalytic effect. It is suggested that this catalytic effect is due to the presence of an oxidative system in herring muscle.

Studies on the Nature of Antioxygens Present in Natural Fats. III. The Occurrence of Antioxygenic Compounds in Extracted Soya-Bean Oilcake. T. G. Green and T. P. Hilditch. *J. Soc. Chem. Ind.* **56**, 23-26T (1937). Extd. soya-bean meal, after digestion with dil. solns. of organic acids (e.g., 2% acetic acid in H_2O or acetone) yields about 10% of material when heated with methyl alcohol. The portion of this ext. soluble in cold acetone (about 2% of the original meal) is a viscous gum which possesses marked antioxygenic properties. In 0.2% concn. in distilled unsaturated fatty esters, the cons. exert marked retarding action on the oxidation of the esters by air at 97.5°. The yield of the conc. is many times greater from the extd. oilcake than from the fatty oils themselves; the antioxygenic compd. removed from oilseeds with the oil appears to be not more than 2 or 3% of the total amt. present in the seed cake. The description of the properties of the antioxygenic concs. previously reported by Olcott and Mattill is generally confirmed.

Oleyl Alcohol. L. A. Hamilton and H. S. Olcott. *Ind. & Eng. Chem.* **29**, 217-223 (1937). The course of oxidation of oleic acid, methyl oleate, and oleyl alco-

Antioxidants and the Autoxidation of Fats. VIII. Autoxidation of Oleic Acid, Methyl Oleate, and

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hol was studied by an apparatus and methods which permit the simultaneous measurement of the oxygen absorbed and of its distribution among the transitory and final products of oxidation, including water, carbon dioxide, and carboxyl, hydroxyl, peroxide and aldehyde compounds. In the initial reactions at the double bonds, each molecule of methyl oleate and oleic acid absorbs approximately four, and each molecule of oleyl alcohol approximately five, atoms of oxygen. Simultaneously each of the three compounds loses one molecule of water. The peroxide level in the early stages of oxidation is higher in oleyl alcohol and methyl oleate than in oleic acid; conversely, the hydroxyl content of oxidizing oleic acid is higher than that of methyl oleate or the extra hydroxyl of oleyl alcohol. The destruction of the double bond occurs faster than would be expected if the reaction proceeded at a unimolecular rate, presumably because of secondary reactions, which becomes more prominent as the oxidation progresses.

Oat Flour as an Antioxidant. Fredus N. Peters, Jr., and Sidney Musher. *Ind. & Eng. Chem.* **29**, 146-51 (1937). Method of preserving oils and fats and foods containing fats according to U. S. patents 2,029,248, 2,038,752 and 2,049,017 are described. Data from comparative tests on treated and untreated substances are tabulated.

Cereal Flours as Antioxidants for Fishery Products, Halibut Liver and Salmon Oils. Leslie Lowen, Lyle Anderson and R. W. Harrison. *Ind. & Eng. Chem.* **29**, 151-6 (1937). The antioxidant value of oat flour was tested on experimentally prepared halibut liver oils and commercial salmon oil. Oat flour was found to retard the initial peroxide formation, and its effectiveness in retarding rancidity increased as less accelerated conditions of exposure to air were used. The salmon oils showed a more pronounced retardation of oxidation and of off odors and flavors than was noticeable in the halibut liver oils.

The Bromine Binding Value as a Characteristic for Fats. Karl Meinel. *Fette u. Seifen* **43**, 250-2 (1936). When fats are treated with a soln. of Br_2 in methyl alc., both addition and a type of substitution takes place and HBr acid is evolved. The new characteristic, Br-binding value is defined as the ratio of the added Br to that converted into HBr. Procedure: 5 g. of fat or oil is dissolved in 10 cc. of CCl_4 (alc.-Br soln. stable). Exactly 20 cc. of 5% Me alc.-Br soln. is added, stir, and add 20-30 cc. H_2O. The excess Br and HBr that developed are then titrated. Loss of conjugated double bonds during heat treating oils can be followed by Br-B. values. The Br-B. value for several oils is presented.

Deposition of Fat in the Liver and Carcass of the Rat on Diets High in Fat and Low in Lipotropic Factors. H. J. Channon, G. N. Jenkins and J. A. B. Smith. *Biochem. J.* **31**, 41-53 (1937). This is a continuation of the studies on the effect of diets high in various fats and low in choline content on depoted body fat and production of fatty livers. Intense fatty livers resulted, varying from 30.7% in the case of butter fat to 7.2% of the fresh liver weight for cod liver oil, but no relationship was found to exist between the amount of fat in the livers and that in the carcasses. The saturated acids of the liver glycerides were found to resemble closely those of the carcass both in the proportion of the total fatty acids and in their mean molecular weights, while the unsaturated acids were less closely related. The liver phosphatide acids showed no relationship with the carcass fatty acids. The effects of the various dietary fats on the amounts of the individual constituent acids of the carcass fats were very marked and are discussed in detail. If desaturation of lower acids takes place, the products are not stored to any measurable extent either in the liver or in the carcass.

Spectroscopic Changes in Fatty Acids. I. Changes in the Absorption Spectra of Various Fats Induced by Treatment with Potassium Hydroxide. II. The Formation of Liquid and Solid "Absorptive" Acids from the Mixed Acids of Linseed Oil. III. The Biological Activity of the Acids of Linseed Oil in Different Spectroscopic States. T. Moore. *Biochem. J.* **31**, 138-154 (1937). The results of Burr & Burr on the inability of the rat to subsist on a diet freed from fat, and on the nature of the lesions sustained, have been confirmed. The mixed acids of linseed oil, both in the "pro-absorptive" state as prepared by a brief saponification and in the "absorptive" state after prolonged treatment with potash, were found to have biological activity in curing the condition. It is doubtful whether the solid acid absorbing at 270 *mu* has biological activity. The only possible criticism of the conclusion of Burr & Burr would appear to lie in the doubtful purity of even the best preparations of linoleic and linolenic acids, which may possibly contain small amounts of more highly unsaturated acids. Data as indicated by the titles were tabulated.

Vitamin D Content of Menhaden Fish Oil. W. C. Supplee. *Ind. & Eng. Chem.* **29**, 190-191 (1937). Menhaden fish oil tested by the chick assay method was found to be relatively high in vitamin D content. A sample of oil from so-called thin fish was found to be at least twice as potent as a sample of oil from medium fat fish from the same catch. Oil from thin fish gave a bone ash of 45.84% when fed at a ⅛% level, and medium fish oil gave a value of 45.91% at a ¼% level. The tentative 4-week chick assay method of the Assoc. of Off. Agr. Chemists was used.

PATENTS

Process of Converting Soybean Oil and of Obtaining Lecithin. H. R. Kraybill (to Purdue Res. Foundation). U. S. 2,069,187. Lecithin is extd. from soybean oil with alcohol or water. The resulting oil does not darken or yield a ppt. on heating. The solvent is evaporated from the ext. to obtain the lecithin.

Improved Stability, Odor and Flavor of Plant and Animal Material. W. Ekhard. Brit. 452,682. An oil or fat is treated with an aqueous soln. of a fermentable sugar which has been inoculated with one or more micro-organisms that form lactic acid and micro-organisms which form alcohol or micro-organisms that

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produce lactic acid and alcohol fermentation, and after the fermentation the fermented liquid is separated from the materials under treatment.

Deacidifying Oils and Fats. G. Leot. Brit. 451,730, Aug. 11, 1936. Oils and fats are deacidified by alkali or alkaline earth coated heavy metal particles, by sprinkling the said particles uniformly on the surface of the body of oil or melted fat.

Stabilization of Animal and Vegetable Fats and Oils. J. K. Hunt and G. H. Lathan (to E. I. du Pont de Nemours). U. S. 2,063,602. Sugar amines or their salts are used as antioxidants.

Stabilizing Nondrying and Semidrying Oils. J. K. Hunt (E. I. du Pont de Nemours). U. S. 2,064,610. Ortho-alkoxy phenols in which at least one of the positions 4 and 5 is substituted by a CHO group are used as antioxidants.

Extraction of Vitaminiferous Oils. F. W. Nitardy and W. S. Jones (to E. R. Squibb & Sons). U. S. 2,067,279. The wt. ratio of water to dry liver of previously cooked livers is adjusted to between 2 and 4 and the material is solvent extd. with use of ethylene dichloride, trichloroethylene or dichloroethylether.

Castor Oil Product. K. T. Steik (to National Oil Products Co.). U. S. 2,068,088. The product claimed is produced by heating a mixt. of castor oil and naphthenic acid to temp. above 100°. This product is soluble in mineral oil and is a neutral mutual solvent for castor oil and mineral oil.

Dispersions of Fatty Acid Anhydrides. I. G. Farbenind. A.-G. Brit. 451,300. Fat acid anhydrides are heated, alkylolamines or other amines or ammonium bases are added and the product is dispersed in water. The product is used for waterproofing textiles, wood, etc.

Hydrogenation Catalyst and Its Preparation. E. C. Williams and S. H. McAllister (to Shell Development Co.). U. S. 2,067,368. A process for the production of an active finely divided catalyst comprises adding nickel formate to isododecane and heating the mixture under super atmospheric pressure to a temp. of 250-350° and using at least a part of the volatile liquid to sweep gaseous decompn. products from the system.

Polymerizing Drying Oils and Fatty Acids. E. W. Fawcett, R. O. Gibson, M. W. Perrin (to Imp. Chem. Indus.). Brit. 452,039. The drying oils or drying fat acids are subjected to heat and pressures from 500 to 3000 atmospheres. The product is used in paints, varnishes, printing inks and the like.

ABSTRACTS

Soaps

***Edited by* M. L. SHEELY**

Errors in Toilet Soap Manufacture. *Soap, Perfumery and Cosmetics* **Jan. 1937,** 41. During air drying, an abnormally high proportion of carbon dioxide in the air may lead to neutralization of the important free alkali with consequent reduction in the storage stability of the soap. Non-uniformly dried soaps tend to lose their homogeneity after framing, especially when the soap shavings have not been passed over the milling rolls a sufficient number of times.

It should also be added that too much water in the soap not only increases the rate at which it is used up but also tends to develop cracks in the bars. If too dry, the soap likewise tends to crack in the finished bars but here the cracks are similar to those obtained with an excessive common salt content while the cracks in soaps containing excessive water are arranged rather in laminae.

On no account should the water content of an excessively dry soap be adjusted merely by adding water. Almost invariably this leads to serious loss of homogeneity. The correct procedure is to blend excessively dry and excessively moist soap shavings by repeated thorough mixing on the milling machine rollers.

The precaution should be taken of seeing that the perfume composition is not excessively acid. It is advisable to determine the acidity of the composition beforehand and to allow a correspondingly higher proportion of free alkali when the acid value is unduly high. When perfuming the soap it is also essential to effect uniform distribution of the perfume.

Analytical Methods Committee. Sub-committee on Methods of Soap Analysis. Report No. 3. The Determination of Free Alkali in Soaps. H. E. Cox and N. Evers. *Analyst* **62,** 36-41 (1937). Sodium soaps.—The best procedure is to determine (1) the total free alkali by adding excess of mineral acid and titrating back with standard alkali; (2) caustic alkali by one of the methods described above. "Carbonate" alkali (3) may be found by difference between (1) and (2) and may be checked by the detn. of alcohol-insoluble alkali or of carbon dioxide. Potassium soaps.—Direct detn. of the carbonate by a titration method is not practicable. The total free alkali (1) should be determined as in Na soaps, free caustic alkali (2) should be determined by the $BaCl_2$ method (which is recognized as giving slightly low results). The carbonate alkali (3) is given by difference or may be determined as CO_2.