

Miscellaneous—Volume XII

	Number	Page
Fall Meeting (Cincinnati)	9	198
.....	10	226
.....	11	254
Spring Meeting (Memphis)	3	55
.....	4	73
.....	5	82

	Number	Page
Spring Meeting (Memphis) Program	5	84
Spring Meeting (Memphis) Golf Tournament, etc.	6	102
.....	6	122
.....	6	125
.....	7	134

ABSTRACTS

Oils and Fats

Edited by

W. F. BOLLENS and M. M. PISKUR

Hydrocracking of animal and vegetable oils, fats and waxes. Yoshiomi Yendo. *Bull. Inst. Phys. Chem. Research* (Tokyo) 13, 1373-94 (1934).—The yield and d. of "gasolines" obtained by the hydrocracking of oils, fats and waxes have been detd. Waxes gave the best results. Similar results have been obtained with oleic and stearic acids.

B. C. A.

Irradiation of fats. I. A. standardized method of use of ultraviolet light. Leslie H. Lampitt, Norman D. Sylvester and Philip Bilham. *Biochem. J.* 29, 1167-74 (1935).—A quartz Hg lamp was arranged to irradiate vertically a cell contg. the fat and also to throw a beam horizontally upon a photoelec. cell connected to a microammeter. By substituting a calibrated thermopile for the cell, the photoelec. cell was standardized and the abs. amt. of light reaching the fat could then be detd. during an irradiation expt. By using the same standardized conditions, reproducible results were obtained on butter fat and the oxidative changes were measured by chem. tests.

E. W. SCOTT.

The synthesis of fats. I. Manufacture of synthetic tallow and butter. Sei-ichi Ueno. *J. Soc. Chem. Ind., Japan* 38, Suppl. binding 237-41 (1935).—"Oil foots" from alkali refining of fish oils contg. 10-20% of the original oils were completely saponified with NaOH and decompd. with dil. H₂SO₄, and the mixed fat acids were washed with hot water. Synthetic tallow was prepd. by fractional distn. of the fat acids under reduced pressure. From 700 g. (acid no. 134) a solid portion of 170 g. (acid no. 208.0) and a liquid portion of 130 g. (acid no. 185.5) were obtained. The distd. fat acids were esterified with glycerol, and the product had an acid no. of 5.0 and an I no. of 51.0. The fat was hydrogenated with a Ni catalyst, and the product had an I no. of 30.0 and a m. p. of 47.0°. Purified fish oils were further saponified with NaOH and salted out with NaCl soln., the soap decompd. with H₂SO₄, and the crude mixed fat acids washed with hot H₂O and hydrogenated with a Ni catalyst at above 200°. Repeated fractional distn. with steam gave a fraction which upon esterification with glycerol resulted in a product having a compn. similar to that of natural tallow. Synthetic butter was prepd. by reesterification, chiefly from mixts. of hydrogenated fish oils and a lower fat acid such as butyric acid. Fifteen expts. reported show that the presence of glycerol and of a catalyst capable of inducing the evolution of H are

essential, while adsorptive substances are of no importance. The synthetic fats had a butterlike odor and were satisfactory for cooking and table use.

KARL KAMMERMEYER.

Methods of decolorizing tea-seed oil. Hsui-Tsi Yü. *Nanking J.* 1, 213-18 (1931).—A mixt. of 25% kaolin and 20% animal charcoal is most suited for the decolorization of tea-seed oil. Comparative results with other decolorizing agents are reported.

C. L. TSENG.

Summary of work done under the botanist in Sind Agricultural Research Station, Sakrand, for the year 1932-33. [Oil seeds.] K. I. Thadani. *Ann. Rept. Dept. Agr. Sind* 1932-33, 94-100 (1934).—The Pusa Yellow, Punjab, Pusa Chocolate and Loido varieties of soybeans, grown in Sind, contained oil 16.80, 17.32, 19.71, 17.86; free fat acids 0.75, 1.05, 1.14, 1.11; albuminoids 38.22, 34.58, 31.79, 22.72; and H₂O 10.38, 10.10, 10.21, 11.80%, resp. Safflower, linseed, castor, sunflower, mustard and rapeseed, grown in Sind, contained oil 30.53, 37.15, 47.04, 29.18, 30.53, 39.20; and free fat acids 1.41, 1.09, 0.55,—, 1.41, 0.92%, resp.

K. D. J.

The partial hydrogenation of fish oil. II. The general course of the hydrogenation of sardine oil. Masakichi Takano and Yoshio Kumeno. *J. Soc. Chem. Ind., Japan* 38, Suppl. binding 252-4 (1935); cf. *C. A.* 28, 354⁴.—A Hokkaido sardine oil having the properties I no. 175.7, sapon. no. 105.7 and acid no. 0.49 was hydrogenated to various I nos. at 220 ± 5° with a Ni catalyst. The fat acids were sep'd. and analyzed for the formation of bromides insol. in Et₂O and petroleum ether, and the Br contents were detd. The exptl. data show that the Et₂O-insol. bromides decrease steadily with decreasing I nos. and are almost absent at an I no. of 111.1. As hydrogenation progresses the highly unsatd. fat acids are hydrogenated faster, being converted into lower unsatd. acids and then into unsatd. acids of the oleic series or satd. acids. Until the disappearance of the highly unsatd. acids is almost complete, the lower unsatd. acids, giving the petroleum ether-insol. bromides, remain almost unchanged, and when these acids are converted to the unsatd. acids of the oleic series, hardly any satd. acids are formed. The fact that neutralization values of the solid acids are markedly higher than those of the liquid acids shows that hydrogenation occurs selectively in regard to the unsatd. acids of higher mol. wt.

KARL KAMMERMEYER.

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Hydrogenating fish oils and marine animal oils. A. Sergeev. *Masloboino Zhirovye Delo* 1935, 79-81.—Oils from white sturgeon and other fish, and from whales and sperm whales, were hydrogenated to produce com. greases or refined edible fats. Tabulated results show m. ps. of the products for different values of hydrogenation time, temp. and H consumption. The edible fats provide vitamin A, fat-sol. vitamin E and assimilate I. JULIAN F. SMITH.

Variations in preparation of catalysts for oil hydrogenation. A. Moshkin and L. Kazakova. *Masloboino Zhirovye Delo* 1935, 81-2.—Comparative expts. in the prepn. of catalysts from Ni (OOCH)₂, Ni (OAc)₂ and Ni-Cu mixts. confirmed the previously observed advantages of adding Cu, namely lowering of the reduction temp. for NiCO₃ and minimizing of the losses incurred in washing the ppt. to remove sulfate. Fatty oils, and acids made by oxidizing vaseline oil, were hydrogenated over catalysts prepd. as described. Results are tabulated. J. F. S.

Aldehyde formation in purified fats. H. Schmal-fuss, H. Werner and A. Gehrke. *Margarine-Ind.* 27, 79-81 (1934); *Chem. Zentr.* 1934, I, 3283; cf. C. A. 28, 7045^{8,4}.—Pure Me laurate and glycerol in quartz tubes were exposed to the radiation of a Hg lamp. With Me laurate the aldehyde reaction with Schiff's reagent appeared in 1.5 hrs., with the Kreis test after 12.5 hrs.' radiation. In the case of glycerol these tests were pos. after 3 and 12.5 hrs.' radiation, resp. It was shown, therefore, that aldehyde rancidity can appear also in the case of satd. compds. without the action of micro-organisms. W. A. MOORE.

Ketone formation in purified fats. VIII. H. Werner, A. Gehrke and R. Minkowski. *Margarine-Ind.* 27, 93-5 (1934); *Chem. Zentr.* 1934, II, 157; cf. C. A. 29, 4959¹.—Soybean oil is rapidly ketonized by light of wave length under 410 mμ, and indeed several times as rapidly as the Me laurate (I), which is appreciably affected only by light under 330 mμ. The decrease in yield with increase in wave length is less abrupt in the case of soybean oil than in the case of I. Hard and soft x-rays and short electromagnetic waves have no ketonizing action upon soybean oil under the conditions studied. M. G. MOORE.

The usefulness of the quinhydrone electrode for work with emulsions of fats. Augusta Unmack. *Kong. Veterinaer-Landsbohøjskole Aarskr.* 1934, 175-90; *Chem. Zentr.* 1934, II, 1862-3.—According to Söncke Knudsen, cream and skim milk obtained from the same whole milk show different pH values when measurements are made with the quinhydrone electrode but not when measurements are made with the H or glass electrodes. The cause is the unequal distribution of the quinone and hydroquinone between fat and water. The distribution coeffs. at 37° of quinone and hydroquinone, resp., are: for coconut oil 1.98, 0.147; butter fat 1.73, 0.124; peanut oil 1.61, 0.077; linseed oil 1.88, 0.097. A formula is given for calcg. the pH correction. M. G. MOORE.

Determination of melting point (of fats and oil). Mieller. *Z. Untersuch. Lebensm.* 69, 73-5 (1935).—The molten fat or oil is drawn into the bend of a capillary U-tube and cooled in ice for 2 hrs. The tube is then placed in a water bath at an angle of 45° so that one end (suitably bent and lengthened) is in air and the other under the H₂O surface. The temp. at which slip is first observed and at which 5-mm. movement of the column has taken place are recorded as the limits of m. p. Comparative results with the Grün and Polenske methods, and the m. p. of the body fat of 30 invertebrate animals, are given. B. C. A.

The solid and liquid components of palm oil. T. A. Buckley. *Malayan Agr. J.* 23, 315-20 (1935).—At the temp. prevailing in Malaya (84° F.) the liquid and solid components of palm oil (acidity under 5%) can be isolated by filtration under various degrees of pressure. The liquid portion (palm olein, I no. 61.3) consists of glycerides of 64% liquid and 36% solid fat acids and is red in color owing to the presence of carotene. The free fat acids from the original oil accumulate in the palm olein. It may be used directly as an edible oil, or bleaching by sunlight with loss of vitamin may be necessary. The solid portions (10-20% of the palm oil) are powdery, almost colorless, with m. p. 54.9° and I no. 11.7, contg. 0.8% of free acid and consisting of 80% glycerides of mostly palmitic, myristic and stearic acids, the remainder being olein. In combination with coconut oil the solid fat can be used to produce a satisfactory soap, or it can be used as a source of fat acids for candles. ALFRED BURGER.

PATENTS

Separating stearin and olein from fat acid mixtures. Ernst A. Mauersberger. U. S. 2,012,106, Aug. 20. A fat acid mixt. such as "twitchelled" bone fat acids is dissolved in a hydrocarbon solvent free from O such as a petroleum "spirit" or benzine and water is colloiddally dispersed or emulsified in the soln. and it is cooled to effect crystn. of stearin. Cf. C. A. 28, 922°.

Lubricating oils. Ange Languasco. Fr. 782,459, June 5, 1935. Vegetable or animal oils or fats, glycerides or fat acids are deacidified, filtered, decolorized and then treated in a rectifying-distg. app. with catalysts composed of metal chlorides, or oxides or metals or metalloids or silicates to obtain lubricating oils. The catalysts are sepd. by dissolving them in water.

Saporific materials. Imperial Chemical Industries, Ltd. Fr. 782,731, June 11, 1935. Saporific materials are made by submitting butter-fat to a distn., following a short path, without boiling, in a high vacuum, e.g., 0.001-0.1 mm. of Hg or less, at a temp. below that at which the saporific materials and (or) the vitamins present are decomposed and collecting the distillate in successive fractions. The fat may be caused to flow on the exterior surface of a vertical interiorly heated tube, surrounded at a distance of 12-25 mm. by a cooled surface.