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ABSTRACTS

Oils and Fats

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M. M. PISKUR and RUTH LINDAHL

Symposium on the whaling industry. Various authors. *Fette u. Seifen* **45,** 1-112 (1938).—The publications contain information on history of whaling, importance of industry, technic, hunting and processing equipment, utilization of whale meat, hydrogenation of whale oil, utilization of the oil in margarine, in soap, for illuminating, in paint, in leather manuf. and for linoleum manuf., and statistics.

Progress in the knowledge of fats. XV. Glycerides of babassu fat. A. Bomer and H. Huttig. *Z. Untersuch. Lebensm.* **75,** 1-33 (1938).—Kernels contained 68.8% fat of m.p. 25°, sapon. No. 251.1, I No. 15.6, acid No. 2.0, R. M. No. 5.9, Pol. No. 11.6, butyric acid No. 0.4, *n* (30°) 40.5 at (40°) 35.0, unsapon. 0.3%. The fat was fractionally distilled. Data on fractions and refractioned fractions were presented. Of the pure glycerides separated myristodilaurin m.p. 34.7 was found in large amts.; some laurodimyristin was found and also small amounts of palmitodimyristin (m. p. 45.7). The still residue contained stearo-dipalmitin (m.p. 55.9); its amt. in the total fat was small.

Oiticica and tung oils. S. O. Sorenson and C. J. Schumann, J. H. Schumann and J. Mattiello. *Ind. Eng. Chem.* **30,** 211-15 (1938).—Commercial batches of oiticica and tung oils were heat-bodied to a wide range of viscosities at varying temperatures. Batches of 250 gals. of oiticica oil were heat-bodied at 450° and 490° F. in air; 1 batch of 215 gals. was heat-bodied electrically at 450° F. in a closed system, under a blanket of CO_2. A batch of 250 gals. of tung oil was heat-bodied at 450° F. in air. The following properties were detd. on samples taken at regular intervals during the runs; viscosity, mol. wt., acid No., sp. gr., refractive index, and sapon. No. The variation of each of these properties with respect to heating time and viscosity is presented in graphical form. The gelation time for oiticica and tung oils at temps. from 400-600° F. was observed. The temp. coefficient for refractive index was detd.

Composition of olein. J. Davidsohn and A. Davidsohn. *Ind. Chemist,* **13,** 402-4 (1937).—The following consts. are suggested for "textile olein special": sp. gr. not below 0.892, acid value 183-208, sapon. No. not over 212, m. p. of fat acids not over 18°, unsaponifiable not over 8%, Mackay test not higher than 103° in 1.5 hrs., and 110° in 2 hrs., flash point not below 168°, setting point not above 6°, cloud point not above 12°, H_2O not over 0.5% and ash not over 0.2%. Products complying with the above but contg. β-naphthol should be designated "textile olein special plus β-naphthol." (*Chem. Abs.*)

The problem of rancidity in fixed oils used for the finishing of textile fabrics. K. L. Dorman. *Amer. Dyestuff Reporter* 27, 89-92 (1938.)—A general discussion of the problem.

Detection and rapid determination of lead in edible oil. Vizern and Guillot. *Ann. chim. anal. chim. appl.* **19,** 252-60 (1937).—Olive oil sometimes contains a little Pb which makes it fail to pass legal restrictions for such purposes as canning sardines. The procedure described here serves to show within an hr. whether a sample contains Pb and whether it contains more than the legal limit. Take 50 g. of oil in a Pyrex flask of 500 ml. and dissolve the sample in 200 ml. of petr. ether contg. 1 ml. of AcOH. Heat to boiling under a reflux, water-cooled condenser. Cool, add 5 ml. of 50% alc. and shake vigorously for 1 min. Filter through a moist filter. Repeat the treatment with alc. 3 times. After the fourth treatment, unite all the aq. alc. exts. which will contain practically all of the Pb. Det. the Pb colorimetrically by comparison with a soln. contg. like quantities of alc., water and AcOH and a known quantity of $Pb(OAc)_2$, taking advantage of the brown coloration of PbS produced by adding 1 ml. of water satd. with H_2S. (*Chem. Abs.*)

The contamination of whale oil with fuel oil. E. R. Bolton, and K. A. Williams. *Analyst* **63,** 84-93 (1938).—In the whale oil floating factories there is sometimes contamination of the oil with fuel oil. This is due to the use of tanks for carrying fuel oil on the outward journey and for transporting whale oil on the return journey. The presence of the fuel oil reduces the quality from the standpoint of color and ease of hydrogenation. Methods for detecting fuel oils in fatty oils are reviewed. The author describes a method. Twenty grams of whale oil sample dissolved in 80 c.c. of petrol ether are filtered through a column of 6 to 8 in. of Al_2O_3 contained in a 2/3 to 1 in. tube, and the oxide is washed with petroleum ether. The first inch of the Al_2O_3 is shaken with 50 c.c. of ether, filtered and the filtrate evapd. The residue is dissolved and the preceding is repeated with a fresh Al_2O_3 filled tube. The final residue is dark brown if more than .005% fuel oil is present.

Separation of the highly-unsaturated acids of fish oils by molecular distillation. E. H. Farmer and F. A. Van den Heuvel. *J. Soc. Chem. Ind.* **57,** 24-31 (1938).—It has been shown that molecular distillation affords a satisfactory and expeditious method for separating the groups of acids of different chain lengths contained in mixed acids of fish oils without promoting isomerisation or polymerisation and that the refractive index/hydrogen value relationship furnishes an ap-

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parently reliable criterion for distinguishing between the original acids and their heat-altered derivatives.

Preparation and application of copper-nickel catalyst (in hydrogenation of oils). G. Kleĭn, N. Kaminskiĭ, M. Litvinov and N. Fedorovich. *Masloboĭno Zhirovoe Delo* **13**, No. 4, 31-4 (1937).—In the hydrogenation of sunflower oil and black cottonseed oil, the best lab. and factory results were obtained with 3-5% of the Cu-Ni catalyst (1:3) pptd. on kieselguhr (1:1). The catalyst is best prepd. by pptg., with stirring at 50-80 r. p. m., a mixt. of $CuSO_4$ and $NiSO_4$ at a concn. of 0.5-0.8% with dil. Na_2CO_3 at 40°, then adding kieselguhr and drying the filter residue at 100-10° to a moisture content of 5-15%. It should contain a max. of 0.3% Fe and only traces of Zn. The mixed carbonates are reduced in oil at 180-220° for 1-4 hrs. until a fat mixt., m. 50-60°, is obtained. After decanting the fat mixt. at 80°, the catalyst is filtered and washed with hot oil. By preliminary bleaching of oils with 1% of the gas-producer C residue (cf. Kleĭn, *et al., C. A.* **30,** 3672^9), edible fat mixts. of excellent whiteness are obtained. (*Chem. Abs.*)

The action of herring oil before and after hydrogenation on the yield and fat percentage of the milk of the goat. W. R. Graham, Jr., and P. T. Cupps. *J. Dairy Sci.* **21,** 45-48.—The results show that hydrogenation of the herring oil destroyed its power to reduce the percentage of fat in the milk. This fact indicates that the factor or factors responsible for the reaction are in unsatd. bonds of the fish oil. Since, however, simple unsatn. has been shown to produce no similar effect, the results must be due to some particular grouping of the unsatd. bonds in these fatty acids. The effect produced when the oil was fed appeared to be generalized through the body rather than localized in the secretion of the mammary gland. The toxicity of the untreated oil as compared to the same oil after hydrogenation indicates that the grouping of unsatd. bonds is reacting with some mechanism which is of general importance to the animal as a whole rather than one which might be specifically related to the secretion of milk.

The source of the fat in experimentally produced fatty degeneration of the heart. J. H. Dible and W. W. Gerrard. *J. Path. & Bact.* **46,** 77-84 (1938).—From the study of the myocardium of guinea-pigs poisoned with P, using as controls animals in similar states of nutrition, it is concluded that the fatty change which may be produced is of the nature of an infiltration and that there is no reason to assume the unmasking of the essential fat of the cell.

The counteraction of fat of the anticalcifying action of cereals. E. J. McDougall. *Biochem. J.* **32,** 194-202.—Rickets produced in young rats by a diet contg. a high proportion of wheat flour or bread and low Ca and vitamin D contents, is prevented by the addn. of 11% lard or olive oil. The explanation is offered that the absorption of Ca from these diets is promoted by the formation of Ca soaps with the fatty acids, while in the absence of fat the Ca combines with the phytin (or its split-product) to form an insoluble compound which cannot be absorbed.

Effect of diets containing fats of various degrees of unsaturation on the serum lipids in rats. A. E. Hansen and W. R. Brown. *J. Nutr.* **15,** 17-22 (1938).—When rats were reared on diets contg. fats of various degrees of unsatn. the I Nos. of the total lipids of the serum tended to vary directly with the I No. of the dietary fats. The values for the total lipis were found to vary inversely with the degree of unsatn. of the serum lipids. The results indicate the possibility of a selective retention of the unsatd. fatty acids of the blood. These data indicate that the character of the diet must be taken into consideration in the interpretation of metabolic studies involving the serum lipids, particularly as regards the degree of unsatn. of the fatty acids. The results show that a positive correlation exists between the degree of unsatn. of food fat, depot fat, and the blood fat.

PATENTS

Method and material for retarding oxidation and rancidity in food substances. H. A. Mattill and H. S. Olcott (to Lever Bros. Co.). U. S. 2,098,254.—Inhibitols (antioxidants) are obtained from the unsaponifiable portion of oils by fractionation to remove pigments and sterols, and finally fractionally distilling. The inhibitol is separated as a fraction distilling between 190° to 210° C. at 0.1 mm. pressure.

Catalytic hydrogenation process. W. A. Lazier. U. S. 2,105,540 and 2,105,664.—High temperature and high pressure hydrogenation processes are described for the production of aldehydes and alcohols respectively.

Composition of fatty matter and process of stabilizing same. A. S. Richardson (to Procter & Gamble Co.) U. S. 2,104,242.—Phorphoric acid and its acid acting derivatives are used as antioxidants.

Margarine. B. Behrend. Ger. 654,742 Cl. 53h Gr. 1/03.—An emulsion of malt, seasoning or a soln. of malt ext. in water or milk and lecithin is used in the manuf. of margarine.

Double salts of copper arsenite and a copper salt of a higher unsaturated fatty acid. F. E. Dearborn (to free use of the Public in the U. S.). U. S. 2,104,584.—An insecticide comprises the complex compd. of 3 molecules of $CuAs_2O_4$ united with 1 molecule of the Cu salt of a fat acid.

Lubricating oil and process for improving same. M. A. Dietrich. U. S. 2,104,796.—High molecular wt. amino alcs. are added to lubricating oils to deter sludge formation. The amino alcs. are prepd. from oils.

Method of rendering. J. P. Harris, W. A. Welch

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(West Virginia Pulp & Paper Co.). U. S. 2,105,478.—Combined rendering and refining app. is described.

Dehydrating oil-containing whale flesh. P. L. Fauth. U S. 2,105,782.—App. is described.

Refining oils. J. B. Carpzow. U. S. 2,093,348.—The fats or oils are treated with acid followed by treatment with chemically active, dry, finely powdered colloid substances from fresh or salt water mud.

ABSTRACTS

Soaps

Edited by M. L. SHEELY

Fat absorption and dialysis of fat acids. F. L. Breusch. *Biochem. Z.* **293**, 280-94 (1937).—Satd. fat acids with 16C or more and oleic acid, whether in aq. colloidal soln. or in the form of soaps in the presence of bile salts, do not diffuse through parchment. The Na salt of oleic acid, however, dialyzes through cellophane. Satd. fat acids with less than 16 C are diffusible, and their diffusibility as well as soly. in the bile salts increases with diminution in mol. wt. Linoleic acid dialyzes quite readily while the unsatd. ricinoleic acid just barely diffuses. In the case of the diffusible lower acids the soaps are about 5 times as dialyzable as the colloidal solns. of the free acids in bile salts. Aq. colloidal solns. of lecithin, which themselves dialyze slowly, increase the rate of dialysis of Na glycocholate 3-5 times, but do not affect the diffusion of soaps. (*Chem. Abs.*)

Modification of lac with higher fatty acids and their mixed glycerol esters. R. Bhattacharaya *London Shellac Research Bur., Tech. Paper* **12**, 16 pp. (1937).—Sixteen parts of oleic acid per 100 parts of lac approaches the limit of combination by heating the components at 130° for 3 hrs. in CO_2. Esterification proceeds more rapidly with suitable catalysts such as B-naphthalene sulfonic acid and p-toluene sulfonic acid. A typical varnish made from linseed oil fatty acid and lac dries to touch in 6 to 8 hrs. Partly esterified products of lac with fatty acids will give an oil-in-water type of emulsion which can be used as a binding agent for finishing material. Lac-fatty acid glycerol esters and nitrocellulose solns. in the usual solvents are compatible in all proportions and yield excellent films upon drying. (*Chem. Abs.*)

The preparation of ketones from higher fatty acids. III. The preparation of ketones from the fatty acids of hydrogenated sardine oil. IV. The preparation of ketones from the fatty acids of coconut oil and hardened rapeseed and soybean oils. Kiichiro Kino. *J. Soc. Chem. Ind., Japan* **40**, Suppl. binding 311-12 (1937).—Fatty acids, obtained from raw coconut oil and from sardine, rapeseed and soybean oils of various degrees of hydrogenation, were heated with equiv. wts. of Mg powder at 330-40° and 300-50°, resp. The m. ps. of the resulting ketones and the temp. of decompn. increase with the mol. wts. of the chief fatty acids in the mixt. The m. ps. of ketones from rapeseed and soybean oils of equal degree of hydrogenation differ but little (81.5-2.5° and 79.5-81°, resp.). For oils of different degree of hardening, the m. ps. of the ketones increase with the decrease in the contents of unsatd. acids. The latter rule is more characteristic of the coconut-oil fatty acids, which are difficultly converted into ketones at 300-10°. In general, the lower the I no., the easier is the conversion of fatty acids into ketones. (*Chem. Abs.*)

Detergents in Dairy Work. W. L. Davies. *Dairy Inds.* 2, 438-9 (1937).—Detergent action involves a variety of phys. and physiochem. reactions working together. These are: soln. of part of the film; hydration (peptization) of the protein; base exchange from the protein to give a more stable or more highly hydrated film; and mutual soln. of the surface in a detergent of similar compn., which tends to disrupt the film from its base. The efficiency of these operations depends on the detergent soln. and the time of reaction. The action of detergents is modified in a minor degree by the hardness of the water. A greater wear of plated metallic surface takes place through wear and tear and abrasion than by the corrosive action of alk. detergents. Some soln. of tin occurs, but this can be minimized by the use of 0.5 to 1.0% of Na sulfite in the detergent mixt. The corrosion of Al by alk. liquids is bound up with the phys. state and purity of the metal. Cryst. or cast Al or sheeting below 94% purity is rapidly attacked, but polished purer sheeting is fairly resistant. The protective action of silicate and phosphate or combinations of them on Al is established. The pH of alk. detergent soln. will usually exceed 11 and bactericidal effect will depend on temp. and time of exposure. In general detergent soln. will have considerable lethal effect on bacteria. (*Chem. Abs.*)

For Lubricating Rubber Parts. *India Rubber World, Jan.* 1, '38, p. 76.—To fulfill a need created by increased use of rubber parts in machines, a composition for rubber lubrication, consisting of a combination of colloidal graphite, glycerin, and water, is now