tion of volatile hydrocarbon does not preclude the use of the apparatus for the determination of halogenated hydrocarbons. The latter, usually chlorinated compounds, are in quite general use as constituents of dry cleaning soaps. In the event an attempt is made to determine the amount of chlorinated hydrocarbon present in a sample serious errors will result due to disruption of the chlorinated molecule by the caustic soda contained in the caustic scrubber. With chloroform, for example, sodium formate and sodium chloride are produced (2).

Several experiments were run to determine the magnitude of the error introduced. In each experiment a soap solution was prepared containing 30 grams of a sprayed soap. The soap was split with 1:1 sulfuric acid and the resulting mixture cooled before the addition of 5 ml. of the chlorinated hydrocarbon. The mixture was then distilled as described in the official procedure. Using the following solvents: chloroform, carbon tetrachloride, ethylene trichloride, and ethylene dichloride, the recovery showed losses ranging as high as 13%. In every case the caustic soda in the scrubber showed an increase in chloride content.

It was found that substitution of water for the caustic soda in the scrubber considerably lowered the per cent of loss of hydrocarbon recovered but did not entirely eliminate it. This is not surprising in view of the fact that the chlorinated hydrocarbons are slightly soluble in water. It appears advisable, on the basis of the above experiments to recommend the substitution of water for the caustic soda solution when determining halogenated hydrocarbons.

LITERATURE CITED

(1) Official and Tentative Methods of the American Oil Chemists' Society, p. A-11 (1941).

(2) Richter, "Organic Chemistry," third edition, translated by Allott, Vol. 1, p. 291, Nordemann Pub. Co., New York (1934).

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

A RAPID METHOD FOR THE DETERMINATION OF THE FAT CONTENT OF FISH TISSUES. W. W. Johnston. *Fisheries Research Board Can., Progress Repts. Atlantic Stas. 32,* 11-12 (1942). *(Atlantic Biol. Sta. Note 78).* Pass the fish livers or tissues through a fine chopper and dil. with an equal wt. of water. To about 15 g. of this material accurately weighed in a Babcock bottle add 25 cc. of a reagent prepd. as follows: To 440 cc. of 24% Rochelle salt soln. add 210 cc. of 20% NaOH soln., 265 cc. EtOH, 175 cc. H_2O and 75 cc. BuOH. Heat the flask at 75° with occasional shaking till the oil seps. sharply (about ½ hr.). Float the oil into the neck of the flask with addnl. reagent and reheat until the contents reach 75°. Per cent oil = reading of flask × 35.6/wt. of dild. sample. The method gives reproducible results which agree closely with those obtained by solvent extn. if the material is in a good state of preservation. *(Chem. Abs.)*

THE DENSITY OF MILK FAT: ITS RELATION TO THE ACCURACY OF THE BABCOCK TEST. Robert Jenness, Ernest O. Herreid, W. J. Caulfield, L. H. Burgwald, E. L. Jack, and S. L. Tuckey. *J. Dairy Sci. 25,* 949-60 (1942). The density of the purified milk fat in this study was relatively constant and was not affected to any marked extent by breed, season, or feed. The density of the fatty materials estimated from Babcock test as fat is higher than that of the corresponding purified fat, but for both types of fat is less than 0.9 at 60°; this introduces a fundamental error in the Babcock test. The coefficient of expansion of the purified fat averaged 78.34×10^{-5} and of the material estd. as fat, 75.58×10^{-5}.

THE FORMATION OF FAT BY THE FUNGUS ENDOMYCES VERNALIS. I. THE INFLUENCE OF THE COMPOSITION OF THE SUBSTRATE ON THE FORMATION OF FAT BY ENDOMYCES VERNALIS UNDER CONDITIONS OF FILM GROWTH. A. L. Bichkovskaya. *Microbiology (U.S.S.R.) 8,* 1170-80 (1940). The substrates studied were 7% yeast water, beer wort, and sucrose molasses. The presence of assimilable N, C, and P was necessary for the growth of a thick film, rich in fat. $(NH_4)_2SO_4$, NH_4NO_3, and $(NH_4)_3PO_4$ did not give good results with yeast water or beer wort but gave better results with the molasses, especially in the presence of chalk. Org. N as an asparagine, peptone and urea gave good results only with yeast water. A sugar concn. of 3-5% was found to be optimum; higher sugar doses retarded the process and the production of fat and caused large amts. of sediment. A deficiency of N in the presence of sufficient sugar reduced the yield of dry substance and increased the percentage of sugar. An excess of N with a deficiency of sugar produced a low yield in dry substance with little or no fat. A-P deficiency resulted in incomplete utilization of sugar while the effect of an excess of P was in the direction of a growth low in fat. At a sugar concn. of 5% the sugar was completely used up in 5-7 days. Thereafter, the no. of fat-contg. cells was reduced. *(Chem. Abs.)*

FAT FROM MUCOR MUCEDO. M. Blinc and M. Bojec. *Arch. Mikrobiol. 12,* 41-5 (1941). The optimum temp. for growth was from 20° to 25° and pH 7. Maltose and dextrose were the most readily utilized sugars and sucrose and lactose the least. Henneberg's wort and molasses were a favorable substrate. So far a yield of 6.5% crude fat has been obtained. The fat is characterized by a high I no.; it is like the fat of seeds. *(Chem. Abs.)*

OINTMENTS AND OINTMENT BASES. III. THE SUITABILITY OF PARTIAL GLYCERIDES OF FATTY ACIDS AS OINTMENT EMULSIFIERS. H. Muhlemann. *Pharm. Acta. Helv. 15,* 1-30 (1940). The nature of emulsifiers is discussed. The emulsifying action of mono- and di-glycerides was tested with yellow petrolatum. The max. effect was obtained with 3-4% glyceride. *(Chem. Abs.)*

CATALYTIC EFFECT OF SULFUR DIOXIDE ON THE CONVERSION OF FATTY OILS. C. van Vlodrop. *Chem. Weekblad 38,* 150-2 (1941). A finely dispersed stream of

SO_2 was bubbled through linseed oil at 290° for 1.25 hrs.; the oil showed only slight discoloration and took up 0.1% S. Mol. distn. which gave a very viscous residue (66% of the charge), proved that polymerization had taken place; *n* was much higher than that of thermally polymerized oils. Solid matter sepd. on cooling from oils that had been polymerized hot by SO_2. The I no. remained unchanged in some cases because the treatment results in the isomerization of oleic acid to elaidic acid. The "hardening" process can be carried out with the liquid SO_2 under pressure at 110-115°; it is less severe than hydrogenation with Ni which requires a temp. of 180°, resulting in the loss of vitamin A and carotene. Elaidinization is more complete with SO_2 than with other catalysts, avoids hydrolysis and conserves the vitamins. The S content remains below 0.01%; color, odor, and taste of the treated oils are good, and the acid no. and I no. remain unchanged. The m.p. of olive oil rose from 6° to 30°; the m.p. of palm oil rose from 36° to 41° after treatment for 2.5 hrs. at 110-15°. Treatment of herring and whale oil with SO_2 facilitates the sepn. of the various oil fractions. A third reaction takes place with oils contg. much linoleic acid (linseed oil) and is even more pronounced with oils contg. conjugated double bonds. An improved tung oil is obtained by treatment with SO_2 and linseed oil can be activated to give a product with a diene no. of about 20. Peroxides must be removed before the SO_2 treatment. *(Chem. Abs.)*

EXAMINATION AND SELECTION OF CATALYSTS: SULFUR DIOXIDE AS A CATALYST IN SEVERAL TECHNICAL AND SEMI-TECHNICAL PROCESSES. H. I. Waterman and C. van Vlodrop. *Chem. Weekblad 38*, 326-9, 338-42, 370-5 (1941). In certain reactions SO_2 can be used as a catalyst instead of Ni. When fatty oils are catalytically polymerized with dry HCl, the oil takes up 2% Cl, the acid no. increases to 36 and a brown color is developed; these phenomena are avoided when SO_2 is used as the catalyst. When linseed oil is heated with SO_2 in a rotating autoclave to approx. 190° for 0.5 hr. at 200 atm. pressure, a product is obtained which has a diene no. of 23 and which resembles wood oil (which has a diene no. of 65). The activation consists in the formation and shifting of conjugated double bonds. Olive oil (I no. 85.5) can be hardened and sepd. by crystn. from acetone into a solid fat (yield 70%, I no. 78.5), m. 32.5°, and an oil 30%) which can be hardened further by liquid SO_2, yielding, after crystn. from acetone, 19% solid fat (I no. 90, m.p. 29.5) and 11% oil (I no. 110.5). Similar results were obtained with soybean oil and whale blubber. The graphical-statistical method of analysis is explained. *(Chem. Abs.)*

AUTOXIDATION OF OXYGEN-ACTIVE ACIDS. III. THE AUTOXIDATION AND FILM-FORMING CAPACITY OF NATURAL TRIGLYCERIDES. Wilhelm Treibs. *Ber. 75B*, 632-44 (1942). In order to be able to study characteristic autoxidizing and drying power of the triglycerides, linseed, poppyseed, and soybean oils which contain linolenic, linoleic, oleic, and stearic acids as the acid components, were decompd. into fractions of closely related triglycerides by bromination in petr. ether. The Br. addn. products of each oil were sepd. into 4 fractions: (1) insol. in petr. ether; (2) insol. in petr. ether, sol. in ether; (3) sol. in petr. ether, pptd. from ether by a little anhyd. MeOH; (4) sol. in petr. ether, not pptd. from ether by a little anhyd. MeOH. The course of the sepn. can conveniently be followed by means of the d., which depends only on the total Br content of the glycerides, not on the distribution of the individual Br. atoms on the different side chains. The debromination was affected with Zn dust in ether or acetone under a reflux condenser. Detn. of the Br addn. products of linseed oil insol. in petr. ether (5 g. suffices) gives practically all the film-forming glycerides. *(Chem. Abs.)*

EXAMINATIONS OF POLYMERIZED MARINE OILS. Finn Jakobsen, Robert Nergaard, and Erling Mathiesen. *Tids. Hermetikind. 27*, 255-66 (1941). Organoleptic, phys. and chem. exam. was made of 66 polymerized oils to be used in the Norwegian canning industry. Canning expts. with sardines in polymerized marine oils and cod-liver oil of different rancidities as well as in olive oil were carried out. The canned products were inspected after storage for 2, 5, and 8 months. A decrease in the rancidity of the oils was noticed after storage. Rather rancid cod-liver oil can be used for packing sardines; a satisfactory canned product is obtained after 8 months' storage. *(Chem. Abs.)*

LIPID OXIDASE STUDIES. II. THE SPECIFICITY OF THE ENZYME LIPOXIDASE. R. J. Sumner. *J. Biol. Chem. 146*, 211-3 (1942). The relative effect of lipoxidase on various unsatd. compds. was investigated. The results of this work indicate that the enzyme is most effective on the structural group:

$$—CH{=}CH—CH_2—CH{=}CH—(CH_2)_7COOH,$$

the double bond nearer the carboxyl group being probably of the cis configuration. These results agree in part with the observations of Spoehr, Smith, Strain, and Milner. These workers, in a preliminary report of independent investigations on this problem, found the fat-peroxidizing enzyme to be effective on compds. similar in structure to oleic acid. They did not report the relative specificity described in this work. However, their method of operation, in which the measurement of O_2 absorption by unsatd. compds. was employed, involved a system vastly different from the aq. suspensions used in this study.

PATENTS

PROCESS OF REFINING OIL. Benj. Clayton (Refining, Inc.). *U. S. 2,301,109-10.* The process of sepg. soapstock from glyceride oil comprises centrifugal sepn. in a centrifuge to remove a portion of the soapstock therefrom, introducing into the resultant sepd. oil while in said centrifuge a relatively small quantity of water and sepg. water from the oil.

METHOD FOR PRODUCING NUT BUTTER. J. C. V. Richardson and Frederick H. Hoffman. *U. S. 2,302,574.* This invention relates to an improved method and machine for reducing edible nuts, particularly peanuts, to a state of fine subdivision in the presence of oleaginous addn. agents for the production of a butter-like food compound.

VITAMIN-CONTAINING EMULSION AND PROCESS OF PRODUCING THE SAME. C. G. Ferrari (General Mills, Inc.). *U. S. 2,300,410.* A stable, homogenized, heat-sterilized, aq. emulsion of an oil-soluble vitamin comprises a colloidal dispersion of casein in an aq. medium, a substantial portion of said casein being present in the form of an alk. metal caseinate; a vitamin contg. oil uniformly and permanently distributed throughout said dispersion in the form of minute globules, said oil being present in an amt. sufficient to dissolve the desired quantity of fat-soluble vitamin but not in excess of 25% by wt. of the finished product; said casein being present in an amt. sufficient to maintain said oil globules uniformly and permanently suspended, but not in excess of 20% by wt. of the finished product.

COMPOSITION OF MATTER. A. K. Epstein. *U. S. 2,299,743.* A composition of matter comprises predominantly soya bean phosphatides, vegetable oil or fat, monostearin, and the residue resulting from the interaction of said soya bean phosphatides with lauroyl peroxide.

MODIFYING FATTY OILS. Laszlo Auer. *U. S. 2,300,090.* In the modification of fatty oils for use as bases of coating materials and plastics, the process comprises mixing the oil with a minor amt. and not more than 30% of a halogen salt, and heating the mixt. to a temp. between about 200° and 350° C. but not above the boiling or decomp. point for at least 30 minutes.

LUBRICANT. L. A. Mikeska (Standard Oil Co.). *U. S. 2,300,131.* Phenolic esters of fat acids or chlorinated fat acids are used as pour point depressors for hydrocarbon lubricating oils.

Abstracts

Soaps

Edited by
ARMOUR AUXILIARIES LIBRARY

LAUNDERING AGENTS AND HARD WATER IN WASHING. Sigurd Kohler. *Tek. Tid. 70,* No. 38, Uppl. A, 365-8 (1940). The insol. film deposited on textiles when hard water is used is definitely deleterious to the textile, more so if the fatty acids have double bonds in that the oxidation of these in sunlight drying also oxidizes the fiber decreasing its tensile strength. *(Chem. Abs.)*

ANALYSIS OF WASHING POWDERS CONTAINING SULFATES AND SULFONATES. S. Ram. *Analyst 67,* 162 (1942). Shampoo and other washing powders contg. alkali sulfates together with a sulfate or a higher alc. of a sulfonate of a fixed oil cannot be analyzed satisfactorily by the methods in Allen's Commercial Organic Analysis. Satisfactory results can be obtained as follows: Ash the powder with excess Na_2CO_3 and det. the SO_4 in the aq. soln. with 2-5 ml. of satd. brine free from sulfate, decant filter and repeat the process 5 times. Rinse the mortar and pestle with brine and wash the filter. Make up to a definite vol. mix and det. the alkali sulfate. The difference between the 2 results shows S present as alkyl sulfate or as sulfonated oil. *(Chem. Abs.)*

THE BEHAVIOR OF SOLUTIONS OF SODIUM SOAPS AT THE INTERFACE OF PARAFFIN OIL AND WATER. Raymond Cavier. *Compt. rend. 213,* 70-1 (1941). The interfacial tension of oil and water is reduced by the soaps. The reduction increases with the no. of double bonds in the fat acid part of the soap. Na dibromoricinoleate is more surface active than Na ricinoleate, and alphabromolaurate is more surface active than the laurate. The activity of Na ricinoleate is equal to that of the oleate. The soaps derived from chaulmoogra oil, and particularly Na hydnocarpate, affect the interfacial tension more than the surface tension. *(Chem. Abs.)*

DIFFUSION OF SEVERAL SOAPS IN SALT-CONTAINING MEDIA. O. Lamm. *Kolloid Z. 98,* 45-52 (1942). The concn. function of the diffusion coeff. of the K soaps of caprylic, capric and lauric acids was detd. from diffusion measurements made according to the concn. differential. A diffusion vessel with a glass filter disk and air seal is described. The const. region of the diffusion-concn. curve indicates a characteristic formation stage of micelles which with increasing length of C-chain moves rapidly toward lower concns. and is affected by the addn. of salt. The region of transformation for laurate in a salt-free medium is approx. 0.025 N. In a salt-contg. medium (0.1 N KOH and 1 N KCl) the formation of the micelles is complete at 0.005 N. With the caprate the value in a salt-free medium (0.11 N) changes to 0.02 N in the 0.1 N KOH and 1 N KCl. The coeff. of diffusion for the caprylate is const. at 0.3 N in the salt-contg. medium. At concns. greater than those specified no dependence of concn. on coeff. of diffusion was observed. For the K soaps at 20° the coeffs. of diffusion in 0.1 N KOH and I N KCl are as follows: laurate 10.0, caprate 12.2, caprylate 17.1, myristate 1.23, times 10^{-7} c.g.s. in 0.005-0.15 N soln. *(Chem. Abs.)*

PATENTS

SOAP AND LUBRICANT CONTAINING THE SAME. Reuben A. Swenson (Standard Oil Co.). *U. S. 2,295,189.* The process comprises reacting litharge and fish oil and then reacting the product so obtained with NaOH at a sufficiently elevated temp. to substantially eliminate any water present in the final product whereby a complex sodium lead fish oil soap is produced.

LUBRICANT. C. M. Grafton (U. S. Rubber Co.). *U. S. 2,299,139.* A rubber to metal high viscosity lubricant comprises a triethanolamine soap as the major non-aq. ingredient in admixt. with starch present in amt. sufficient to form a substantially nonflowing aq. soln. with said soap.

SOAP STOCK PURIFICATION AND PRODUCT. B. H. Thurman (Refining, Inc.). *U. S. 2,299,603.* A high quality soap product contg. at least 40% of purified soap stock prepd. from soap stock obtained from the alkali refining of vegetable oil consists essentially of soap and substantial amts. of other detergent compds. resulting from the thermal decompn. of materials including proteinaceous material originally present in the soap stock and being substantially free of odorous and decomposable proteinaceous material.

HARD-WATER SOAP. Robert B. Colgate. *U. S. 2,294,075.* Hard-water soap contg. tetraphosphates, pyrophosphates or metaphosphates together with a mineral oil sulfonate.

GERMICIDAL SOAP. A. James Smith. *U. S. 2,296,121.* Germicidal soap contg. Chloramine-T, Chloramine-B or D-choleramine-T. Various compns., exp. cream soaps are described.