pounds are not present in the oil obtained by hydraulic pressing of cottonseed fumigated with methyl bromide. The results also indicate that the methyl bromide has reacted to produce nonvolatile bromine compounds, presumably inorganic bromides (3), which do not enter the oil. The observation recorded in Table I, that the fumigated cottonseed stored in burlap bags did not lose bromine over a period of 50 days, is further indication that methyl bromide decomposes or reacts in the seed to yield nonvolatile bromine compounds.

Acknowledgments

The assistance of Richard D. Westbrook and Wade H. Hoffman, Jr., in processing the cottonseed for oil is acknowledged.

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Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

SOLVENT EXTRACTION PROCESS APPLIED TO COTTONSEED. N. H. Moore (Delta Products Co., Wilson, Ark.). *Food Industries 19,* 471-3 (1947). Results of pilot plant operations at Wilson, Ark., indicate increased yield of cottonseed oil by solvent extraction, as compared with hydraulic process. New plant starts soon with operating capacity of 200 tons daily.

THE MIXED UNSATURATED GLYCERIDES OF LIQUID FATS. VI. LOW-TEMPERATURE CRYSTALLIZATION OF RAPE OIL. T. P. Hilditch, P. A. Laurent, and M. L. Meara (Univ. Liverpool). *J. Soc. Chem. Ind. 66,* 19-22 (1947). The mixed glycerides of rape oil were separated by systematic crystallization from acetone at low temperatures into 3 fractions. The component acids of each fraction were determined. Spectrographic analysis of alkali-isomerized acids from selected ester-fractions showed the presence of more linolenic acid than had hitherto been reported, and also of small amounts of a docosadienoic acid, $C_{22}H_{40}O_2$.

SOME UNSAPONIFIABLE CONSTITUENTS OF THE DEODORIZATION DISTILLATES OF VEGETABLE OILS. H. Jasperson and R. Jones (J. Bibby & Sons, Ltd., Liverpool). *J. Soc. Chem. Ind. 66,* 13-17 (1947). An examination has been made of some of the unsaponifiable constituents of the deodorization distillates of coconut oil, palm kernel oil, palm oil, peanut oil, cottonseed oil, and sunflower seed oil. The presence of large amounts of Me ketones, chiefly Me-nonyl-ketone, has been confirmed in the case of coconut oil and palm kernel oil distillates, and small amounts have been demonstrated in those of palm, peanut, cottonseed, and sunflower seed oils. The presence of carbinols corresponding to some of the ketones has been confirmed in the distillates of coconut and palm kernel oils. The predominant type of hydrocarbon was shown to be terpenoid, exhibiting strong absorption at λ maximum 230 mμ and possessing strong odor and a nauseating flavor. The mean unsaturation (Wijs, 30 minutes) of the terpenes examined from each distillate were as follows: palm oil 130, peanut oil 46, cottonseed oil 36, sunflower seed oil 68, palm kernel oil 41, and coconut oil 22.

THE PIGMENTS OF COTTONSEED. II. GOSSYCAERULIN, A BLUE QUINONOID GOSSYPOL DERIVATIVE OCCURRING IN COOKED COTTONSEED. C. H. Boatner, C. S. Samuels, C. M. Hall, and M. C. Curet (Southern Regional Research Lab., New Orleans, La.). *J. Am. Chem. Soc. 69,* 668-72 (1947). A blue pigment, gossycaerulin, has been prepared by heating acidified solutions of gossypol, and reaction conditions which favor the formation of this pigment have been determined. The properties of purified gossycaerulin have shown it to be a polar, α-hydroxy, quinonoid, oxidation product of gossypol. A yellow pigment has been detected as a byproduct formed from gossypol during its conversion to gossycaerulin. A purple compound resulting from the reaction of gossycaerulin with H_2SO_4 has been shown to exhibit the reactions of a quinonoid compound. Gossycaerulin has been detected in cooked cottonseed, and the extent of its formation has been shown to be correlated with the disappearance of gossypol, the length of heating, and the pH developed during heating of the seed.

HARDENING OF FAT WITH RANEY NICKEL. S. Schmidt-Nielsen and E. Spillum. *Kgl. Norske Videnskab. Selskabs Forh. 17,* No. 31, 122-5 (1944). To determine the effect of the Ni content of the alloy, 7 alloys containing 15-60% Ni and 3.6-3.8% of Al were prepared, and 0.5% of each catalyst was used with (a) 100 g. of refined and (b) 100 g. of crude herring oil at 75° and 100° atmosphere for 60 minutes. The selective effect of the Raney-Ni catalysts is the strongest for the catalyst with the weakest action, decreasing with the progress of the process. To determine the intermetallic compounds known to form in Al-Ni alloys, an alloy with 28% Ni was treated with diluted HCl (30 g./l.); there was obtained a mass of needle-shaped crystals of the color of metallic Ni of a compound corresponding to $NiAl_3$. Treatment of the crystals with NaOH gave a very active catalyst of 3.7% Al; this shows the importance of the remaining of part of the Al in the catalyst. (*Chem. Abs. 41,* 115-6.)

CHANGES OF CATALYST IN POISONING. A. D. Khvatov (Moscow State Univ.). *J. Gen. Chem.* (U.S.S.R.) *16,* 407-14 (1946). Confirmation was secured for the supposition that, on poisoning of Ni catalyst by CO, there occurs not only an intensive topochemical change of the surface but also the change of structure of the components of the catalyst which changes the basic course of the reaction. The change in Ni is apparently the determining factor in the changes of the other catalyst components. The greatest drop of activity corresponds to the greatest change of disperse nature of the catalyst and a minimum amount of removed metal. The control reaction used was the dehydrogenation of cyclohexane. (*Chem. Abs. 41,* 904.)

TOTAL FAT DETERMINATION IN FOODS. Th. v. Fellenberg (Eidg. Gesundheitsamt, Bern). *Mitt. Lebensm. Hyg.* 389-402 (1944). Reichert's method for the extraction of fat from dry yeast with 95% MeOH and then ether has been modified for the determination of fat in dry egg powder. The best results were obtained by percolating the material with ether to separate the fat and free lecithin. For substances of low fat content, such as bread and flour, the separation of the fats with HCl was discussed. However, the treatment with HCl destroys some of the lecithin and thus causes a decrease in the total fat. This latter method always yields a darker colored fat than direct extraction; this may be due to the development of ether-solution substances under the influence of HCl. In vegetable matter where the fat is occluded in cells, the treatment with HCl must be preceded by an ether extraction followed by an alcoholic extraction. Since this operation is too slow for practical application, a modified HCl-method was proposed. (*Chem. Abs. 41,* 229.)

A COMPARISON OF THE BABCOCK, GERBER, MINNESOTA, PENNSYLVANIA, AND MOJONNIER METHODS FOR DETERMINING THE PERCENTAGE OF FAT IN HOMOGENIZED MILK. G. M. Trout and P. S. Lucas (Mich. Agr. Exper. Sta., East Lansing). *J. Dairy Sci. 30,* 145-59 (1947). Homogenization does not affect the Mojonnier fat test of milk. The modified Babcock method (17.5 ml. of 1.835 sp. gr. H_2SO_4 added in 3 portions, 8, 5, and 4.5 ml., respectively, and shaken for at least 2 minutes before centrifuging) may be used with much assurance of accuracy in testing homogenized milk. Homogenization does not affect the Gerber test. While the Minnesota method yielded average tests of homogenized milk within +0.027% of those of nonhomogenized milk, the tests varied from those of the Mojonnier on the average by —0.433%. It would seem, therefore, that the test could not be recommended for testing homogenized milk. The Pennsylvania method, yielding tests on homogenized milk in these studies markedly lower than the Mojonnier method, cannot be recommended for testing homogenized milk.

ESTERS OF LONG-CHAIN, HYDROXY ALIPHATIC ACIDS. H. B. Knight, E. F. Jordan and D. Swern (Eastern Regional Research Lab., Philadelphia, Pa.). *J. Am. Chem. Soc. 69,* 717-18 (1947). 9,10-Dihydroxyoctadecyl 12-hydroxystearate was prepared from 9,10-dihydroxyoctadecanol, m.p. 84.5-86°, and 12-hydroxystearic acid, m.p. 80-81°, prepared from hydrogenated castor oil. 9,10-Dihydroxyoctadecyl 9,10,12-trihydroxystearate was prepared from 9,10-dihydroxyoctadecanol and 9,10,12-trihydroxystearic acid, m.p. 110°. Tetrahydrofurfuryl 9,10-dihydroxystearate was prepared from tetrahydrofurfuryl alcohol, b.p. 115.7° (100 mm.), and 9,10-dihydroxystearic acid, m.p. 95°. The crude esters were obtained in quantitative yields and were hard, waxy solids. The purified products were white, odorless solids with the same solubility characteristics as the esters previously reported.

EXAMINATION OF THE CHLORO ESTERS OF SOME LONG-CHAIN FATTY ACIDS BY X-RAYS. J. Brenet (Natl. Sci. Res. Center, Bellevue). *J. Phys. radium 7,* 139-44 (1946). The purpose was to determine the structure and orientation of the chloroethyl esters of lauric (I), myristic (II), palmitic (III), and stearic (IV), acids. The de Broglie revolving-crystal method was used. In certain cases up to 17 successive reflection orders were observed. Reticular distances d_1 were calculated as follows: I, 38.6 A.; II, 43.3; III, 47.9; IV, 52.6. The molecules are shown to form layered pairs owing to polarity of the Cl and CO-O. $d_2 = 3.6$ A.; $d_3 = 3.8$ A. (the small principle equidistances). The extension of the theory of Shearer to molecular complexes permits obtaining theoretical values of the distribution of the intensities of the rays as a function of the order of reflection and to obtain satisfactory agreement with the observed values. (*Chem. Abs. 41,* 897.)

THE COMPOSITION OF THE CHOLESTEROL ESTERS AND GLYCERIDES IN THE LIVER OF THE RAT. R. G. Sinclair and L. Chipman (Queen's Univ., Kingston, Canada). *J. Biol. Chem. 167,* 773-9 (1947). Rats were fed for several weeks on diets containing 2% cholesterol and 49% of either elaidin, beef tallow, or corn oil. By selective enzymatic hydrolysis of the glycerides, followed by alkaline hydrolysis of the cholesterol esters, the fatty acids of the 2 components were obtained separately. These acids were fractionated by the Pb salt-alcohol method into solid and liquid fractions. The cholesterol esters always contain a lower percentage of fully saturated acids than the glycerides in the same liver, though in both it varies with diet. In the rats fed elaidin, elaidic acid makes up a higher percentage of total acids in the cholesterol esters than in the glycerides.

VACCENIC ACID IN BUTTERFAT AND THE FLUCTUATIONS IN ITS AMOUNT. E. Brouwer and M. C. E. Jonker-Scheffener (Agr. Univ. Wageningen). *Rec. trav. chim. 65,* 408-12 (1946). Vaccenic acid (I), a solid isomer of oleic acid with a double bond between C_{11} and C_{12}, discovered by S. H. Bertram, was present in considerable amounts (average values in 2 series: 3.90 and 4.93%) in butterfat from cows on grass, and in smaller amounts (1.76, 1.28%) in butterfat from cows on winter ration. Evening and morning milks did not differ in I content. A positive correlation was observed between I content and iodine value of butter fat, but for a given iodine value the butterfat of cows on winter rations was distinctly lower in I content than that of cows on grass. The I determination method used was that of J. Grossfeld and A. Simmer which isolates the solid fatty acid fraction and measures its iodine value; it is assumed that no unsaturated solid acid other than I is present. (*Chem. Abs. 41,* 227.)

THE BIOLOGICAL AVAILABILITY OF L-ASCORBYL PALMITATE. A. M. Ambrose and F. DeEds (U.S.D.A., Albany, Calif.). *Arch. Biochem. 12,* 375-9 (1947). *l*-Ascorbyl palmitate was found to have antiscorbutic activity comparable to an equivalent amount of ascorbic acid, 2.36 mg. of the ester being equivalent to 1 mg. of ascorbic acid.

THE DEPOSITION AND ANTIOXYGENIC BEHAVIOR OF α-, β-, AND γ-TOCOPHEROLS IN RAT FATS. W. O. Lundberg (Univ. Minnesota, Minneapolis). R. H. Barnes, M. Clausen, N. Larson, and G. O. Burr. *J. Biol. Chem. 168,* 379-89 (1947). The amounts of synthetic α-, β-, and γ-tocopherols deposited in abdominal fats of rats have been compared by means of measurements of the autoxidative behavior of the rendered fats. Even when allowing for possible differences in the degree of purity of the samples, it was found that synthetic γ-tocopherol was deposited in much smaller amounts than either the synthetic α- or β-tocopherol, the amounts of the latter 2 being more nearly alike. As with the α-tocopherol, the β- and γ-tocopherols appeared not to reach their maximum depositions until 7 or more days after feeding, and possibly not until 15 days in the case of the β-tocopherol. In the O_2 absorption measurements at 100°, samples of abdominal fat containing γ-tocopherol showed a more gradual increase in the rate of O_2 uptake at the end of the induction period than did samples containing α- and β-tocopherols. This behavior appears to be an inherent property of γ-tocopherol, possibly being attributable to the development of an oxidation product which is in itself somewhat antioxygenic. The results indicate that the biopotencies of tocopherols are not directly related to their effects upon the autoxidation characteristics of the rendered fats in which they are deposited by feeding. The results suggest that a relationship may exist between the biopotencies and the relative amounts of tocopherols deposited in various body fats or other tissues.

STUDY OF THE METABOLISM OF CERTAIN HIGHER FAT ACIDS BY MEANS OF RADIOACTIVE BROMINE. Buu-Hoï, M. Berger, P. Daudel, R. Daudel, S. May, and Cl. Miguet (Polytech. School, Paris). *Helv. Chim. Acta 29,* 1334-7 (1946). The rates of metabolism of some linear higher fat acids were compared with higher fat acids bearing branched chains. Radioactive Br was added to the acid to be studied; the acid was given in 5-mg. subcutaneous doses to mice. At intervals the mice were sacrificed, and isolated organs were tested with a Geiger-Muller counter for the presence of the radioactive fat acid. A rapid passage across the organism was indicated by the rapid concentration in the gall bladder. The duodenum also showed a rapid concentration, and elimination was effected in feces. Blood and liver collected almost equal quantities of the fat acid. When branched-chain fat acids were made radioactive and injected, the concentrations found in the organs were lower than those with "normal" straight-chain acids. Conclusion: Addition of side chains to the higher-fat acids retarded their metabolism. (*Chem. Abs. 41,* 190-1).

THE EFFECT OF CONTINUOUS INTRAVENOUS FEEDING OF VARIOUS SUBSTANCES UPON THE SECRETION OF MILK FAT. A. I. Mann and J. C. Shaw (Maryland Agr. Exper. Sta., College Park). *J. Dairy Sci. 30,* 183-96 (1947). A technic was developed for the continuous intravenous feeding of ruminants. The continuous intravenous injection of cows with a protein hydrolysate, glucose, oleic acid, and acetic acid failed to prevent the decrease in the lower fatty acids of milk fat caused by fasting. A summary of the work to date renders the theory of a blood carbohydrate origin of the lower fatty acids extremely unlikely. The data obtained from the continuous injection of butyric acid are inconclusive.

PHYSICAL CAPACITY OF RATS IN RELATION TO ENERGY AND FAT CONTENT OF THE DIET. B. T. Scheer, S. Dorst, J. F. Codie, and D. F. Soule (Univ. So. California School Med., Los Angeles). *Am. J. Physiol. 149,* 194-203 (1947). Methods are described for the determination of body specific gravity, and capacity for exhausting work, in rats. The specific gravity determination is based upon determination of body volume by displacement. Physical capacity is determined by measuring the duration of a swim to exhaustion with regularly increasing work load. There was no significant correlation between specific gravity and fat content of the body in the rats studied. There was a small positive correlation between specific gravity and duration of swim, and a similar small correlation between body weight and duration of swim. Physical capacity determined by this method was not influenced by sex or previous swimming experiences. It was influenced by previous opportunity for exercise and by diet. When diets varying in fat content from 0-40% were fed *ad lib.* physical capacity of the animals increased with increasing fat content of the diet. When caloric intake was severely restricted, physical capacity decreased markedly; the level attained was independent of the fat content of the diet. After a period of caloric restriction sufficiently severe to result in death of a considerable proportion of the animals, the physical capacity of the survivors returned to essentially normal levels within 6 weeks after return to *ad lib.* feeding.

INFLUENCE OF FAT NUTRITION ON THE GROWTH, THE FERTILITY, AND THE LONGEVITY OF RATS. I. B. v. Euler, H. v. Euler, and I. Rönnestam-Säberg (Univ. Stockholm). *Arkiv. Kemi, Mineral Geol. A22,* 12 pp. (1946). A preliminary report of experiments on the influence of fat nutrition on development which ran 26 months. Animals were maintained separately on a stock diet, a butter, and a margarine-containing diet. With regard to the mortality of females, the number of litters born, the number of offspring per litter, and their mortality during the first month of life, the margarine diet was better than the butter one. However, the individual weight of the offspring was higher on the butter diet. The results with stock-diet groups were the best. Vitamin E is suggested as an important factor in these experiments. (*Chem. Abs. 41,* 1017.)

DEGREE OF UNSATURATION AND MOLECULAR WEIGHT OF FATTY ACIDS IN THE MUSCLES BEFORE AND AFTER PROLONGED FASTING. V. Capraro and M. Pasargiklian (Univ. Milano, Italy). *Boll. soc. ital. biol. sper. 22,* 186-7 (1946). The I no. of the unsaturated acids of guinea-pig muscles increased from a value 33% above that of oleic acid after a normal diet to a value 81% higher after fasting. After fasting the molecular weight was slightly lower than that of oleic acid; this indicates a single carboxyl group to each molecule. There was no evident variation in the total fat acid concentration of the muscles during fasting and no variation in the I no. of the fat acids of the blood. (*Chem. Abs. 41,* 504.)

THE MECHANISM OF ACTION OF THE ANTIFATTY LIVER FACTOR OF THE PANCREAS. III. A COMPARISON OF HYDROLYZED AND UNHYDROLYZED CASEIN IN THE PREVENTION OF FATTY LIVERS OF THE COMPLETELY DEPANCREATIZED DOG MAINTAINED WITH INSULIN. I. L. Chaikoff, C. Entenman, and M. L. Montgomery (Univ. California Med. School). *J. Biol. Chem. 168,* 177-81 (1947). In contrast to unhydrolyzed protein which, even when fed in very large amounts, fails to stop the development of fatty livers, hydrolyzed casein readily prevents fatty livers in completely depancreatized dogs maintained with insulin. The antifatty liver action of 20 g. of hydrolyzed casein in this animal preparation can be accounted for by its methionine content. The evidence presented here supports the view that a defect responsible for the development of fatty livers in the completely depancreatized dog maintained with insulin is in the mechanism by which the methionine of ingested protein is made available for lipotropic purposes.

The urinary excretion of a fat-mobilizing agent. R. Weil and DeWitt Stetten (Columbia Univ., New York). *J. Biol. Chem. 168,* 129-32 (1947). A material capable of provoking an increase in the fat content of the mouse liver appears in the urine of the fasted, but not of the normally fed rabbit. Like the fat-mobilizing substance of the anterior pituitary gland, this material is precipitable at pH 5.2 by 2 volumes of ethanol, and its possible relationship to pituitary adipokinin has been discussed.

Lipoid substance in the cells of proximal convoluted tubules of the kidneys of young rats on a choline-deficient diet. W. S. Hartroft and C. H. Best (Univ. Toronto, Canada). *Science 105,* 315 (1947). The appearance of fat may be secondary to degenerative changes in the tubular epithelium resulting from dietary lack of the lipotropic factor, choline; but the possibility that it may be important in the production of the other lesions of the "hemorrhagic" kidney is being investigated. The fatty droplets are observed before the onset of congestion, necrosis, hemorrhage, or cast formation. It has already been demonstrated that the lipase content of the proximal convoluted tubule is diminished or absent in such kidneys. Reduction of the ratio of the phospholipid fraction to the total lipid content has also been established. Further biochemical and histochemical investigations of the nature of the histologically demonstrable fat are being undertaken to determine its relationship, if any, to the kidney lesions which result from choline deficiency.

Blood pressure of rat during acute and chronic choline deficiency. S. S. Sobin and E. M. Landis (Harvard Med. School). *Am. J. Physiol. 148,* 557-62 (1947). In rats acute choline deficiency to the point of death, and chronic choline deficiency during 5 months, did not affect blood pressure significantly. The striking renal lesions of acute and chronic choline deficiency do not belong to that group of renal abnormalities which frequently produce hypertension, but resemble those lesions, *e.g.,* the nephroses, which generally have no effect on blood pressure.

Lipid metabolism and development of anemia in splenectomized guinea pigs fed cholesterol. B. Kennedy and R. Okey (Univ. California, Berkeley). *Am. J. Physiol. 149,* 1-6 (1947). The reaction of 15 splenectomized guinea pigs to control and cholesterol rich diets has been studied. Growth of these animals was normal while they were on a stock ration but a semisynthetic diet containing 12.5% fat which had given fair growth in intact animals failed to produce weight gains in the splenectomized group. Operated animals consistently lost weight when fed cholesterol. There was no evidence of abnormal red cell destruction in the splenectomized animals fed the stock ration, a slightly increased rate of destruction when they were fed the diet higher in fat and a very rapid red cell breakdown in the operated animals fed cholesterol. Results of this study may therefore be taken to indicate that the hyperplasia of the spleen observed in guinea pigs made anemic by cholesterol feeding is not directly responsible for the anemia. The great increase in total cholesterol of corpuscles and plasma, the decreased lecithin-cholesterol ratios in blood, and liver cell destruction remain possible causes.

PATENTS

Winter vegetable oils. H. D. Royce (Southern Cotton Oil Co.). *U. S. 2,418,668.* The stability against clouding is improved by addition of a small amount of Al stearate.

Dehydrated butter. J. L. Jakobsen (Genral Mills, Inc.). *U. S. 2,418,645.* The process comprises dehydrating butter under vacuum to less than 5% moisture content.

Method of manufacturing ice cream and the product thereof. W. D. Roth, L. C. Brown, and G. W. Phelps (Industrial Patents Corp.). *Re. 22,858* of *U. S. 2,065,398.* The process of controlling overrun in the manufacture of ice cream comprises preparing the desired mix and adding thereto a small percentage of glyceryl ester of a higher fatty acid having a free glyceryl alcohol group.

Processing of castor oil. G. F. Coggins and J. F. Ahearn (Aerovox Corp.). *U. S. 2,418,819.* Castor oil is refined for dielectric purpose by first alkali refining and then repeated treatment with fuller's earth until the electrical resistance reaches a maximum.

Cleaning composition for removing sludge from internal-combustion engines. G. M. Skinner (National Carbon Co., Inc.). *U. S. 2,418,908-9.* The cleaning composition comprises a mixture of ethylene glycol monoethyl ether, mesityl oxide, Me amyl acetate, mineral oil, water, and morpholine oleate.

Bituminous adhesive. S. A. Moore and T. Greenfield (Interchemical Corp.). *U. S. 2,418,135.* This is a mixture of petroleum and asphalt fractions, and stearin pitch.

Art of dielectrics. G. F. Coggins and J. F. Ahearn (Aerovox Corp.). *U. S. 2,418,820.* A dielectric structure comprising absorbent cellulosic material impregnated with castor oil having a power factor of less than .05% measured on 1000 cycles at 185°F. and a resistivity of more than 10^{12} ohms per cc. at 185°F., such structure when incorporated in a capacitor being characterized by greatly improved insulation resistance, power factor, and life.

Rust-preventive composition. M. H. Kollen and M. T. Flaxman (Union Oil Co.). *U. S. 2,418,075.* An anti-rust composition comprises 5-95% of oil-soluble polyvalent metal tall oil soap and 5-85% of oil-soluble polyvalent metal degras soap.

Soaps

Edited by LENORE PETCHAFT

The application of semiboiled process in the manufacture of washing soaps. Z. A. Qureshi. *Indian Soap J. 12,* 43-6 (1946). The semi-boiled process is one in which saponification is completed in the pan without separation of the glycerine. A summary of the process is given including description of apparatus, directions for graining to obtain correct size of grains, boiling procedure, addition of fillers, and framing.

Continuous process for soap. Gordon W. McBride (Chemical Engineering, Washington, D. C.). *Chem. Eng. 54,* No. 4, 94-7, 134-7 (1947). The process is reviewed, and consists of continuous countercurrent hydrolysis under pressure and at high temperature with a catalyst, followed by continuous distillation, neutralization, and finishing. The mixture of fats, in the proper proportions for whatever soap is being made, reacts with water to split into fatty acid and glycerine. The fatty acid is purified by distillation and then is neutralized. The resulting "neat soap" may be finished into any of the usual products. The by-product glycerine is concentrated in a multiple-effect evaporator which is synchronized with fatty acid production. Flow sheet is included.

EVALUATING DISHWASHING DETERGENTS. Walter D. Tiedman (N. Y. State Dept. of Health). *Soap Sanit. Chemicals 23,* No. 4, 48-50, 102 (1947). The need for a simple test for determination of the detergent value of dishwashing compounds is reviewed. A good dishwashing compound should soften water or disperse the hard ions, emulsify the fats deposited by food, deflocculate other food materials, disperse the solids, evenly wet all surfaces of the dishes, rinse freely to keep dishes free from deposits, leave no stains on dishes, be non-irritating to skin, and be non-poisonous. A review of existing tests was made.

A FRENCH PROCESS FOR CONTINUOUS SAPONIFICATION. I. THEORY. Felix Lachampt Establissements Monsavon). *Inds. corps gras 3,* 4-12 (1947). This preliminary laboratory work for the development of the continuous saponification equipment included the effect on the rate of saponification of the dispersion of water-in-oil, temperature of the oil, concentration of the lye, concentration of the electrolytes, content of free fat acids, and influence of β-naphthol utilized as a catalyst. The dispersions obtained by various means are illustrated with microphotographs and the other data are plotted. The conditions necessary for equilibrium are discussed on the basis of the data obtained and the phase studies of McBain. II. THE REALIZATION. M. J. Seemuller. *Ibid.* 47-53. The flow sheet of the continuous method comprises special proportioning pumps for lye and fat, a reaction conduit, a cooling conduit, a holding tank for crude soap, proportioning pumps for crude soap and brine, a decanter, a holding tank for purified soap, and continuous 2-stage equipment for neutralizing excess alkali. The decanter contains 4 compartments supplied with stirrers, and means for completing saponification and salting out the glycerol stock. Other accessory equipment includes continuous means of acidifying glycerol stock and filtering it. The process is controlled by automatic equipment which is not fully described.

DEVELOPMENT OF MERSOL. Anon. *Soap Sanit. Chemicals 23,* No. 4, 81-2 (1947). The "Mersol" method of producing synthetic detergents involves the direct and controlled chlorination of hydrocarbons to form "sulfochlorides" which when neutralized with low grade caustic form Na sulfonates.

IONIC AGENTS AND THEIR IDENTIFICATION (ACTIVE AGENTS FOR THE REDUCTION OF THE SURFACE TENSION). E. F. Gobel. *Rev. quim. ind.* (Rio de Janeiro) 15, No. 173, 16-23 (340-7) (1946). Methylene blue and uranin in equal quantities give in transmitted light the following colorations: with an anionic product, yellowish green to dark green with strong fluorescence; with a non-ionic product, navy blue with little fluorescence; with a cationic product, vivid blue to bluish red, with no fluorescence. In dilutions of 1:2000 to 1:5000 the coloration changes so that it can be utilized for better differentiation between the products of the group proper and the neighboring group, *e.g.,* between acylamides and alkylaryl sulfonates, the former changing considerably toward blue, whereas the latter remains unchanged or changes very little. This change between dilutions of the same product shows that there is a different behavior in the charge of the molecules, in reference to the surface tension and the molecular charges of the solution. Instead of $CaCl_2$ as used by Linsenmeier a 1% solution of crystalline $MgSO_4$ was used. $MgSO_4$ gave a clearer picture in the evaluation of the alkylaryl sulfonates, oils and esters of sulfonated oil, and fatty alcohols. Wetting tests, cleansing and degreasing tests, emulsion tests, dye fixation tests, and tests of power of dispersion are recorded. 11 references. (*Chem. Abs. 41,* 2593.)

THE BLENDING OF WATER WITH ORGANIC SOLVENTS BY DETERGENTS. S. R. Palit and J. W. McBain (Stanford Univ., Calif.). *J. Soc. Chem. Ind. 66,* 3-5 (1947). Dodecylamine hydrochloride added to chloroform even in low percentages enables the chloroform to dissolve large quantities of water, up to 45 molecules of water per molecule of detergent. Conversely, the water enables the chloroform to dissolve a quarter of its weight of dodecylamine hydrochloride, although both these substances are nearly insoluble in chloroform. Hexanolamine oleate blends water with cyclohexane, benzene, and CCl_4 but not with chloroform, whereas cetyl pyridinium chloride blends water with chloroform and not with nitrobenzene. These results are explained on the basis of competition between water and solvent and detergent for H bonding. Excess of amine or Et alcohol greatly increases blending power; oleic acid or octyl alcohol reduces it. Freezing point depression of benzene by oleates shows them to be moderately associated to an average extent of 3⅓ molecules per particle. Addition of large amounts of water produces an almost negligible further effect. Hence the water and the soap are largely in highly associated colloidal particles.

INORGANO-ORGANIC GELS IN PINENE. V. GEL-STRENGTH MEASUREMENTS OF GELS OF SODIUM STEARATE IN PINENE. Mata Prasad, S. S. Dharmatti, and G. S. Hattiangdi (Royal Inst. Sci., Bombay). *Proc. Ind. Acad. Sci. 24A,* 287-94 (1946). The gel strengths of gels of Na stearate in pinene were measured by means of a plunger method. For these gels log (gel strength) varies linearly with log (concentration). VI. VISCOSITY CHANGES WITH TIME AND SHEAR DURING THE GELATION OF SOME SOAP SYSTEMS IN PINENE. *Ibid.* 295-303. G. S. Hattiangdi and S. P. Adarkar. A rotating-cylinder viscometer was used to determine the viscosity of gel-forming solutions of Na oleate, stearate, or palmitate in pinene. Determinations were made at various time intervals at different rates of shear. (*Chem. Abs. 41,* 1910.)

THE EFFECT OF SURFACE LAYERS ON WETTABILITY AND FOAMING OF EMULSIONS. D. Dervichian and F. Lachampt. *Bull. soc. chim. 1946,* 486-91. A general discussion on emulsions in which a mechanism involving a surface layer is used to explain wettability and foaming. (*Chem. Abs. 41,* 2260.)

THE ROLE OF THE SURFACE LAYER IN THE PHENOMENA OF EMULSIFICATION, FOAMING, AND WETTING. II. MOLECULAR STRUCTURE AND ROLE OF EMULSIFYING AGENTS. F. Lachampt and D. Dervichian. *Bull. soc. chim. 1946,* 491-4. A general discussion of emulsions and emulsifying agents. III. STRUCTURE AND ROLE OF FOAMING AGENTS. *Ibid.* 495-7. A discussion of foams and compounds used to promote and to inhibit foam formation. (*Chem. Abs. 41,* 2260.)

Solubilization of water-insoluble dye by pure soaps and detergents of different types. Sister Agnes Ann Green and J. W. McBain). Immaculate Heart Coll., Los Angeles, Calif.). *J. Phys. & Colloid Chem. 51,* 286-98 (1947). The Na soaps of oleic or lauric acids were better solubilizers for the water-insoluble dye Orange OT (1-o-tolylazo-2-naphthol) than the K soaps on a g.-molecular weight basis. The solubilizing action of a cation-active detergent, dodecylamine hydrochloride, was greater than that of the neutral anion-active detergents of the same molecular weight and was comparable to that of laurylsulfonic acid. The solubilizing power of a 10% solution of a non-ionic detergent, Triton X-100, was about ¼ that of the anhydrous detergent and its solubilization curve was similar to that of the colloidal electrolytes indicating that the aqueous solutions of this agent were highly colloidal. The addition of benzene, toluene, or hexane in small amounts increased the solubilization of Orange OT by K laurate, but the addition of 5% of alcohol decreased the solubilization. Na naphthenates were not as effective as the fatty acid soaps of the same molecular weight but had a higher range of solubility. Their solubilizing power increased with increasing equivalent weight. (*Chem. Abs. 41,* 2245.)

Effect of electrolytes on cation-active detergents. John A. Hill and C. L. F. Hunter (British Launderers' Research Assoc., Hendon, Eng.). *Nature 158,* 585 (1946). In 0.01 *N* Na_2SO_4, a concentration of 0.0025% cetyltrimethylammonium bromide produced the maximum lowering of surface tension, whereas in the absence of added electrolyte a concentration of 0.015% was necessary for the same effect. By the addition of extremely small quantities of Na_2SO_4 the concentration of cetyltrimethyl ammonium bromide required to produce a given effect as an antiseptic was halved. (*Chem. Abs. 41,* 2593.)

PATENTS

Detergents. Peter W. Tainsh (Lever Brothers & Unilever Ltd.). *Brit. 567,716.* Nontransparent soap having a yellowish or off-white tint is incorporated with a small proportion of a blue-fluorescent substance, such as a hydroxycoumarin, umbelliferone, or β-methylumbelliferone, and also with a blueing agent, such as indigo or a blue alizarin dye, and an opacifying agent. The tint is thus substantially eliminated. (*Chem. Abs. 41,* 2596.)

Drying Oils

Edited by HOWARD M. TEETER

Stillingia tree as a source of drying oil. W. M. Potts (A. and M. Coll. of Texas, College Station). *Paint, Oil, Chem. Rev. 109,* No. 25, 16, 18 (1946). The oil of the stillingia tree (Chinese tallow) if properly extracted is superior to linseed oil in paints and requires no heat bodying. Drying similarly to high-quality linseed oil, it gives films which weather better than linseed oil films, withstanding boiling water for 6 days without blistering, and do not retain blush. Spectrographic examination of the oil indicates presence of an unknown constituent. Stillingia seeds contain oil 20.3 and edible tallow 23.9%. The extracted meat contains 76.4% protein of pleasant taste. (*Chem. Abs. 41,* 2589.)

Tung oil. R. S. McKinney (Gainesville, Fla.) *U. S. Dept. Agr., Bur. Agr. Ind. Chem.* AIC-*94,* 13 pp. (1946). A review of the production, uses, and chemical and physical properties of tung oil, together with statistical data on its consumption, imports, and prices in the U. S. in stated years. 65 references. (*Chem. Abs. 41,* 2256.)

PATENTS

Process for making coating material emulsions. L. Auer (Interchemical Corporation). *U. S. 2,418,-451-3.* Air-sensitive emulsions of fatty oils, of the oil-in-water type, are prepared by bodying the oils to a controlled degree, emulsifying the bodied oil with water by the use of a suitable agent, adjusting the pH and exposing the dispersed phase to the action of activated O_2 until a solid and coherent film is formed.

Isomerized fatty acid esters. L. Auer (Interchemical Corporation). *U. S. 2,418,454.* Fatty acid esters with improved drying properties are prepared by heating a polyunsaturated fatty acid with anhydrous alkali at 150°-350° for ½ hour or until a decrease of 5-60 units in saponification number is effected, splitting the soap, and removing the soap cations.

Reconstitution of glycerides. J. F. Murphy and E. K. Holt (Lever Bros.). *U. S. 2,418,898.* A glyceride is reconstituted by fatty acid interchange between the glyceride and a lower alkyl ester of a different fatty acid than at least one in the glyceride, this ester must be less readily distillable than the corresponding ester of a fatty acid in the glyceride. The glyceride in liquid form is subjected to vapors of the ester in a reaction zone and the reconstituted glyceride and reconstituted lower alkyl ester are separately and simultaneously removed from the reaction zone.

Process of dispersing oil gels. H. G. Berger, G. S. Crandall, and J. F. Socolofsky (Socony-Vacuum Oil Company. *U. S. 2,418,920.* A gel of a drying or semi-drying oil is dispersed in an oil of the same type with the aid of a small amount of a heterocycle organic *N* compound as a dispersing agent.

Process of bodying drying oils and the product resulting therefrom. H. G. Berger, G. S. Crandell and J. F. Socolofsky (Socony-Vacuum Oil Co.). *U. S. 2,418,921.* A gel of about the consistency of art gum is formed by gelling oiticica oil, perilla oil, dehydrated castor oil or mixtures of these with less than an equal quantity by weight of linseed oil. A gelation catalyst (HF or BF_3) is used. The gel is dispersed in an unbodied drying or semi-drying oil by distributing the gel throughout the oil in which it is to be dispersed in particles no larger than small lumps, and heating the mixture to a temperature of at least around 500°F.

Fractionation of glyceride oils. Lever Bros. and Unilever Ltd. *Brit. 582,557.* Oil is dissolved in any solvent and chilled rapidly to —20 to —60°F. with agitation to yield a more saturated fraction in a flowable form. Soybean oil (I. V. 132.2) was separated into a solid fraction (I. V. 129.2) and a liquid fraction (I. V. 144.7) when 7 parts of acetone was used with 3 parts of oil. When the I. V. of the solid fraction soybean oil is 125 or less it is substantially free from reversion. The process may be adapted to continuous operation. (*Chem. Abs. 41,* 2595.)

Paint remover composition. H. Packer. *U. S. 2,-418,138.* This is a mixture of organic solvents, lactic acid, wax, and sulfonated castor oil.