Oils and Fats

Edited by
M. M. PISKUR and MARIANNE KEATING

APPLICATION OF SELECTIVE SOLVENT FRACTIONATION OF KARITE FAT (SHEA BUTTER). E. Andre and M. J. Pradain. *Oleagineux 3,* 72-3 (1948).

MANUFACTURE OF SHEA BUTTER. R. Francois. *Oleagineux, 3,* 74-5 (1948).

PRODUCTION, TECHNIC, AND ECONOMICS OF THE AFRICAN VEGETABLE OIL INDUSTRY. A. Ferrara. *Olearia 1947,* 342-56.

ANALYSES OF PROCEDURES FOR THE EXTRACTION OF OIL FROM OIL SEEDS. A. Paleni (Univ. Bologna). *Olearia 1948,* 14-28. Theoretical aspects of production calculations for hydraulic expeller and solvent extraction is discussed.

HOW TO IMPROVE QUALITY OF INEDIBLE FATS. J. P. Harris (Industrial Chem. Sales Div.). *Nat'l Provisioner 118,* 13 (1948). The author sets up rules for rendering inedible fats for the production of good white soaps.

FATTY MATERIAL FOR THE PHARMACEUTICAL INDUSTRY. B. Gauthier. *Olearia 1947,* 328-38.

EXPERIMENTAL AND TECHNICAL PREPARATION OF HIGHER FATTY ALCOHOLS FOR SULFONATION. G. B. Martinenghi. *Olearia 1947,* 311-19. Review of methods.

PREPARATION OF LAURIC ALCOHOL BY HYDROGENATION OF THE ESTERS OF COCO-BUTTER. A. Willemart, M. Loury, and Pierre Everaerts. *Oleagineux 3,* 68-71 (1948). The preparation of lauric alcohol by catalytic hydrogenation of the total esters of coco-nut butter, offers a superiority over the well-known method of Bouveault and Blanc in that it does not require the manipulation with costly solvents, such as alcohols, or dangerous products such as sodium. On the other hand, the use of a high-pressure apparatus is necessary and a particular care is needed in the preparation of the catalyst. The conditions for the best yield are discussed.

PRACTICAL ASPECTS OF INTERESTERIFICATION OF FATS. M. Naudet, O. Micaelli, and P. Desnuelle. *Oleagineux 3,* 57-64 (1948). The present work is on the study of certain possible practical applications of the interesterification of fats. They show how more concrete fats (palm-kernel, copra) can, without risking separation, be incorporated to a given quantity of fluid oil (peanut, sunflower) if the mixture is interesterified. They take into account preliminary experiments showing that the interesterification usually lowers temperatures of plasticity of solid mixtures (palm-kernel-tallow and palm-kernel hydrogenated peanut).

STUDIES ON RANCIDITY OF BUTTERFAT. S. Mukherjee and M. Goswami (Univ. Coll. of Science & Tech., Calcutta). *J. Indian Chem. Soc. 24,* 239-48 (1947). Development of rancidity on butterfat on storage with different chemicals has been studied. Effect of hydrogen passed into the butterfat at room temperature has been investigated. The dissolved hydrogen has been found to stop hydrolytic rancidity of butterfat for a period of 5 months and to retard oxidative rancidity to a very great extent. Effects of packaging, pyrogallol, catechol, gallic acid, pyrocatechol, hydroquinol, Na citrate, oxalic acid, coumarin, α-tocopherol, and ascorbic acid were evaluated.

THE DEFECTS OF METALLIC AND METALLIC-OILY FLAVOR WITH BUTTER. H. Mulder. *Netherlands Milk and Dairy J. 1,* 219-24 (1947). The defects are caused by the oxidation of fat or fat-like substances of the cream. Indications for this supposition are non-occurrence of the defects with skimmed milk, the raised peroxide number of the fat when the defect is present and the possibility of preventing the defect with the aid of antioxidants. As the acidity of the cream has such a great influence and water-soluble antioxidants can prevent the defects, the oxidation process probably takes place in the boundary of the fat phase or in the water phase of the cream. The experiments are being continued. THE ACIDITY OF CREAM AFFECTING THE FLAVOR OF CREAM AND BUTTER. H. Mulder and J. H. B. Kleikamp (State Agr. Exper. Sta. Hoorn). *Ibid.,* 225-31. The acidity of cream considerably influences the occurrence of poor flavors caused by the oxidation of the fat and/or the fatty components of the cream. According as the cream was more intensively soured the following defects occurred within 24 hours respectively: metallic, metallic oily, "trainy," tallowy. The presence of an antioxidant can prevent the defects referred to. This is important because it shows that it must be possible to fight the typical cold-storage defects in butter with the help of antioxidants soluble in water. Experiments to this effect are being made. The "trainy" defect (a typical cold-storage defect of butter) does not occur when the natural surface layers of the fat globules are absent and therefore is not produced in washed cream. Milk salts promote the occurrence of the defect concerned. The possibility of bringing out the "trainy" defect within 24 hours will probably be of great importance for the study of the occurrence of cold-storage defects in butter.

RAPID DETERMINATION OF N-OCTANOIC ACID. A. L. Lehninger and S. W. Smith (Univ. Chicago). *J. Biol. Chem. 173,* 773-83 (1948). A simple method for the rapid determination of octanoic acid in small amounts has been described. The method involves deproteinization with mixtures of $CuSO_4$ and $Ca(OH)_2$, acidification of the filtrate, and extraction of the fatty acid into petroleum ether. The extract is washed with H_2O and the fatty acid then extracted into 0.1 *N* NaOH. An aliquot of the aqueous phase is brought to pH 5.6 by addition of acetic acid. The addition of silver ions produces a turbidity of silver octanoate, stabilized with gum ghatti, the optical density of which is proportional to octanoic acid concentration. The method responds only to n-octanoic acid and immediately adjacent homologues. A large variety of compounds likely to be present in enzyme reaction media were found not to interfere with the determination.

THE EFFECT OF SURFACE-ACTIVE SUBSTANCES ON THE FUCHSIN REACTION OF HIGHER FATTY ALDEHYDES. G. Ehrlich, H. E. Taylor, and H. Waelsch (Columbia Univ., New York). *J. Biol. Chem. 173,* 547-51 (1948). Naturally occurring lipides and synthetic surface-active substances inhibit the color development of the higher fatty aldehydes and their acetals in the fuchsin test as proposed by Feulgen and used in the original

or modified form by others. If the surface-active substances are added after color has developed, rapid fading occurs. Addition of synthetic detergents in the determination of aldehydes present in tissue lipides also suppresses the development of color to a marked degree. These findings cast serious doubt on the usefulness of the fuchsin method for the quantitative determination of the higher fatty aldehydes as carried out with the Feulgen method or its modifications. The effect of surface-active, naturally occurring or synthetic agents is suppressed to a large degree if the Schiff reaction is carried out in a medium containing a high concentration of acetic acid.

INFRA-RED ABSORPTION SPECTRA OF TOCOPHEROLS AND RELATED STRUCTURES. H. Rosenkrantz (Cornell Univ., New York City). *J. Biol. Chem. 173,* 439-47 (1948). The infra-red absorption spectra, from 2-12 μ, of 9 free and substituted tocopherols and 6 related structures have been presented. Assigned absorption bands near 3.0, 6.3, and 8.0 μ in addition to unassigned bands near 8.6 and 10.9 μ are characteristic of the tocopherol structure.

THE VISCOSITY OF SOLUTIONS OF PRIMARY ALCOHOLS AND FATTY ACIDS IN BENZENE AND CARBON TETRACHLORIDE. W. J. Jones, S. T. Bowden, W. W. Yarnold, and W. H. Jones (Tatem Laboratories, University College, Cardiff, Wales). *J. Phys. and Colloid Chem. 52,* 753-60 (1948).

THE EFFECT OF ORGANIC NON-ELECTROLYTES UPON THE CONDUCTIVITIES OF AQUEOUS SOLUTIONS OF CATIONIC COLLOIDAL ELECTROLYTES. A. W. Ralston and D. N. Eggenberger (Armour and Company). *J. Am. Chem. Soc. 70,* 983-7 (1948). The effect of the presence of benzene, cyclohexane, hexane, octane, dodecane, heptadecane, octadecane, hexanol, octanol, dodecanol, octadecanol, undecyl chloride, stearonitrile, and stearamide upon the equivalent conductivity of aqueous solutions of dodecylammonium chloride has been determined. The influence of the presence of dodecane and lauronitrile upon the equivalent conductivity of aqueous solutions of dodecyltrimethylammonium chloride has also been investigated. With the exception of heptadecane and octadecane all the compounds investigated lowered the equivalent conductivity and the critical concentration for micelle formation in the amine salt solutions. The results have been discussed in relation to the micelle theory and it has been proposed that solubilization and micelle formation are allied phenomena.

CONDUCTIVITIES OF QUATERNARY AMMONIUM CHLORIDES CONTAINING TWO LONG-CHAIN ALKYL GROUPS. A. W. Ralston, D. N. Eggenberger, and P. L. DuBrow (Armour and Co.). *J. Am. Chem. Soc. 70,* 977-9 (1948). The equivalent conductivities of dioctyldidecyl-, didodecyl-, ditetradecyl-, dihexadecyl-, and octyldodecyldimethylammonium chlorides have been determined. Didodecyldimethylammonium chloride shows a maximum value at concentrations below the critical point and evidences of maxima are also present with both its lower and its higher homologs. The conductivity behavior of the dialkyldimethylammonium chlorides has been compared with that of several alkyltrimethylammonium chlorides. THE EFFECTS OF ELECTROLYTES UPON THE CONDUCTIVITY OF AQUEOUS SOLUTION OF DODECYLAMMONIUM CHLORIDE. *Ibid.,* 980-3. The effect of the presence of NaCl, Na acetate, $KC_2H_3O_2$, Ca acetate, HCl, acetic acid, and tartaric acid upon the equivalent conductivity of aqueous solutions of dodecylammonium chloride has been determined. The results have been discussed in relation to the micelle theory.

FAT AND CALCIUM METABOLISM. V. THE INFLUENCE OF BUTTER AND MARGARINE ON THE CALCIUM AND PHOSPHORUS METABOLISM OF GROWING RATS. A. Westerlund (Roy. Agr. Coll., Sweden, Uppsala). *Kgl. Lantbruks-Hogskol. Ann. 14,* 325-65 (1947). Six female litter mates from each of two litters of young albino rats were fed for 41 days a diet low in Ca and high in P and vitamins A, D, and B which contained 14% fat. Two of the 4 groups had margarine and the rest butter as a fat in the feed mixture. Ca and P balances and the weights of the femurs of the rats were determined. The differences between groups were not sufficiently larger than those between individuals to permit conclusions to be drawn except by statistical analysis. Fecal Ca/urinary Ca was found to be inversely correlated with fecal P/urinary P. The weights of the femurs are controlled by the Ca/P balances. The diet which contained butter caused a higher retention of Ca and a lower retention of P than did that which contained margarine. Of the total caloric intake of the rats 31% was fat. The implication of the results for human nutrition is discussed. Only Ca and P of the food mixtures are presented besides the Ca and P contents of the urine and feces. (*Chem. Abs. 42,* 960.)

ARE PHOSPHOLIPIDS OBLIGATORY PARTICIPANTS IN FAT TRANSPORT ACROSS THE INTESTINAL WALL? D. B. Zilversmit, I. L. Chaikoff, and C. Entenman (California Medical School, Berkeley), *J. Biol. Chem. 172,* 637-50 (1948). A discussion is presented on the use of relative specific activities of phospholipid P for comparing phospholipid turnover under different experimental conditions. In the dog, neither the amount nor the turnover of the phospholipid of the mucosa or the villi of the small intestine is affected by the absorption of cream, corn oil, or corn oil fatty acids. In the rat such increases in the relative specific activities of phospholipid P of the small intestine as may occur during fat absorption are too small to account for all of the absorbed fat having passed through a phospholipid stage. The findings presented here fail to support the hypothesis that phospholipids are obligatory intermediates in the passage of absorbed fat through the intestinal wall.

MINERAL METABOLISM STUDIES IN DAIRY CATTLE. II. EFFECT OF CALCIUM AND MANGANESE AND OTHER ELEMENTS ON THE METABOLISM OF LIPIDS DURING EARLY LACTATION. G. M. Ward and J. T. Reid (New Jersey Agr. Exper. Sta., Sussex). *J. Nutr. 35,* 249-55 (1948). Although the ingestion of Ca tended to spare neutral fat and sterols, a corresponding increase was observed in the excretion of soaps and free fatty acids, resulting in a qualitative rather than a quantitative effect. These data would indicate that the estimation of crude fat by the commonly employed ether extraction procedure is likely to be misleading in experiments involving the analysis of dairy cow feces.

THE EFFECT OF EXTIRPATION OF VARIOUS ENDOCRINE GLANDS ON THE PRODUCTION OF FATTY LIVER. R. A. Shipley and Ethel Buchwald Chudzik (Western Reserve Univ. School Med., Cleveland, Ohio), and Paul György. *Arch. Biochem. 16,* 301-7 (1948). The effect of surgical removal of various endocrine glands on liver fat was studied in rats kept on a diet low in lipotropic factors. Thyroidectomy prevented a depo-

sition of excess fat in the liver of rats (male and female). Adrenalectomy (in the male) and hypophysectomy were accompanied by partial protection. Extreme weight loss in the latter group could have been at least partially responsible for the low liver fat. Castration in the male had no definite effect. Ovariectomy resulted in augmentation of the fat content.

FATTY ACID TRANSFORMATIONS BY ANAEROBIC BACTERIA. William D. Rosenfeld (Univ. of California, La Jolla). *Arch. Biochem. 16,* 263-73 (1948). The transformation of naturally occurring fatty acids in marine sediments was traced to a limited extent and attributed to the presumable activity of anaerobic bacteria. Saturation of fatty acids buried in sedimentary materials was observed to increase with depth, i.e., with geologic age. Fatty acids were subject to oxidation by anaerobes. No information was obtained concerning the specificity of fatty acid dehydrogenases, but the ability to dehydrogenate the acids was quite generalized among the anaerobes investigated. Among the important factors affecting dehydrogenation are toxicity and solubility of the substrate. The pronounced reducing effects of bacterially activated formic acid were sufficient to induce considerable hydrogenation of linoleic acid.

LIPIDS OF THE FASTING MOUSE. IV. LIVER TOTAL LIPID CONTENT. H. C. Hodge, P. L. MacLachlan, W. R. Bloor, E. Welch, *et al.* (Univ. Rochester, N. Y.). *Proc. Soc. Exptl. Biol. & Med. 67,* 137-9 (1948). Young adult male albino mice lose about ⅓ of the initial body weight during a 5-day fast. The liver weight decreases logarithmically. In the first 2 days of fasting a marked increase was observed in total liver lipid of young, male mice. Thereafter a decrease to less than normal values followed on the 3-5 fasting days.

THE SYNTHESIS OF FATTY ACIDS IN ADIPOSE TISSUE IN VITRO. B. Shapiro and E. Wertheimer (The Hebrew Univ., Jerusalem, Palestine). *J. Biol. Chem. 173,* 725-8 (1948). Adipose tissue incubated *in vitro* in serum enriched with deuterium oxide introduced deuterium into its fatty acids. The rate of introduction is greater in adipose tissue of rats on a diet accelerating fat synthesis in the body.

THE REQUIREMENTS OF THE FATTY ACID OXIDASE COMPLEX OF RAT LIVER. A. L. Lehninger and E. P. Kennedy (Univ. Chicago). *J. Biol. Chem. 173,* 753-71 (1948). Particulate material separated from rat liver homogenized in isotonic salt solutions, washed with saline, and then suspended in water showed no activity in the oxidation of fatty acids when supplemented with ATP, Mg^{++}, and phosphate buffer. When the material was suspended in saline instead, the preparations were highly active with the supplements named. The function of the neutral salts in the fatty acid oxidase system appears to lie in the production of an enzymatically active "flocculated" form of the enzyme from an inactive "dispersed" form.

EFFECT OF LIPOTROPIC AGENTS IN A DIET CONTAINING PURE AMINO ACIDS IN PLACE OF PROTEIN. C. S. Rose, T. E. Machella, and P. Gyorgy (Univ. Pennsylvania, Philadelphia). *Proc. Soc. Exptl. Biol. & Med. 67,* 198-9 (1948). It may be noted that the weight of the livers paralleled the fat content consistently. Rats fed an alipotropic diet in which a mixture of amino acids replaced protein developed fatty livers in spite of low food intake and emaciation. Methionine in adequate dosage exerted a lipotropic effect although there was still 10% of fat in the liver when the methionine constituted 2.4% of the diet. When 25 mg. of choline chloride per day were fed the livers were essentially normal.

THE EFFECT OF PYRUVATE AND INSULIN ON FATTY ACID SYNTHESIS IN VITRO. K. Bloch and W. Kramer (Univ. Chicago). *J. Biol. Chem. 173,* 811-12 (1948). The data presented here suggest that one of the actions of insulin is concerned with the metabolism of pyruvate in general and specifically with the utilization of pyruvate for the synthesis of fatty acids.

PHYSICAL STATE OF LIPIDS AND FOREIGN SUBSTANCES PRODUCING ATHEROSCLEROSIS. J. R. Moreton (The Joseph Edgar Tyree Memorial Lab., Salt Lake City, Utah). *Science 107,* 371-3 (1948). The evidence indicates that the ingestion of fat-rich meals, by producing the temporary appearance of large lipid particles in the blood, causes the normal defense mechanisms of the intima to retain some of these particles and thus gradually and infinitesimally to build up the full picture of stenotic and occlusive arterial disease.

STUDIES ON THE NUTRITIONAL EFFECTS OF HEATED FATS. A. Lane (by invitation) and A. C. Ivy (Univ. of Ill., College of Medicine, Chicago). *Federation Proc. 7,* 69 (1948). The experiment was designed to study the effect of heated fat as compared to unheated fat on the nutrition of rats. Two diets composed of a homogeneous mixture of bread, milk, and lard, which in one diet was heated to 350°C. for 30 minutes and unheated in the other diet were fed to young, adult white rats. In the group eating high fat, which had been heated, the food intake and body weight curve were below the group eating the same diet with unheated fat content. These studies are being continued.

NEUROMUSCULAR DISTURBANCES FROM LACK OF ESSENTIAL FAT ACIDS IN THE RAT AND PIGEON. Raoul Lacoq, Paul Chauchard, and Henriette Mazoue (Sorbonne, Paris). *Compt. rend. soc. biol. 141,* 449-50 (1947). When rats or pigeons are deprived of linoleic and linolenic acids for 5-7 days a neuromuscular disorder appears, characterized by a decrease in the chronaxia of the peripheral motor nerves and an increase in muscle chronaxia. The effects are much like those seen in avitaminosis A or E. (*Chem. Abs. 42,* 970-1.)

EFFECT OF SEASON, BREED, AND SPECIES OF RUMINANTS ON THE VITAMIN A POTENCY OF BUTTERFAT. B. C. R. Sarkar (Michigan State College). *J. Dairy Sci. 31,* 165-72 (1948). The seasonal variations in vitamin A potency of butterfat and other constituents in herd milk of Hariana cows have been investigated. The vitamin A potency varied with the level of carotene intake. The potency was maximal in the monsoon periods (July, August, and September) when the cows were getting sufficient carotene from grazing and again during the winter months (February and March) when large quantities of cultivated fodders were available. The average maximum total potency approximated 24,972 I.U. per lb., of which 2,700 I.U. were due to carotene. The average minimum potency of 16,093 I.U., of which 1,322 I.U. were due to carotene, was obtained in November, December, and January, when very little green feed was available.

PATENTS

GLYCERIDE OIL REFINING WITH FOOTS SOFTENING AGENT. B. Clayton (Benjamin Clayton, Houston,

Tex.). *U. S. 2,437,075.* In refining animal and vegetable oils wherein impurities are removed in the form of aqueous foots by centrifugal separation, the improvement comprises the separation of the foots by centrifugal separation in the presence of a softening agent for the foots selected from the group consisting of abietic acid, naphthenic acid, and water soluble soaps of such acids, the amount of the agent being sufficient to substantially soften the foots.

HYDROBLEACHING AND HARDENING GLYCERIDE OILS. W. J. Paterson (Lever Bros. Co.). *U. S. 2,437,705-6.* The present inventions relate to the treatment of glyceride oils or fats which are susceptible to a reduction in color or color and unsaturation, and may be used to provide an oil or fat product having a markedly reduced color and, if desired, one which may be hardened simultaneously to any desired degree and may be rendered more stable against the incidence of rancidity. The process comprises special hydrogenation with Fe-Ni-O or Fe-Cu-O catalyst.

HYDROCAFFEIC ACID AND ESTERS AS ANTIOXIDANTS. L. W. Elder and H. S. Levenson (General Foods Corp.). *U. S. 2,437,731.* A process of stabilizing fats, fatty acids, fatty acid derivatives, and oils of animal and vegetable origin against oxidative deterioration which comprises adding thereto a material selected from the group consisting of hydrocaffeic acid and alkyl esters thereof.

DODECYLAMINE SALT OF 2-MERCAPTOBENZOTHIAZOLE AND PROCESSES FOR MAKING THE SAME. A. Minich (Nuodex Products Co., Inc.). *U. S. 2,437,170.*

HYDROCARBON RESIN-SULFURIZED OIL COMPOSITION. F. J. Soday (The United Gas Improvement Company). *U. S. 2,436,456-7.* A feature of the invention is the provision of compositions comprising one or more sulfurized oils in combination with one or more resins.

MINERAL OIL COMPOSITION. O. M. Reiff and H. J. Andress (Socony-Vacuum Oil Co.). *U. S. 2,438,876.* An improved mineral oil composition comprises a mineral oil having admixed therewith a minor proportion sufficient to stabilize the mineral oil against oxidation, of an oil-miscible metal salt of a diaryl sulfide of an alkyl-substituted diaryl dithiophosphoric acid, the alkyl substituent thereof having at least 20 C atoms.

Drying Oils

Edited by ROBERT E. BEAL

SOME ASPECTS OF THE PROCESSING AND UTILIZATION *of* DEHYDRATED CASTOR OIL. R. Wilson. *J. Oil & Colour Chemists' Assoc. 31,* 41-61 (1948). Samples of castor oil were dehydrated at 760 (I) and 40 (II) mm. pressure under nitrogen at 280° with 0.2% concentrated H_2SO_4 catalyst. Loss in weight during dehydration was 0.4% less for (I) than for (II), however, (II) produced an oil of lower acid and hydroxyl values and higher iodine value than (I). Films of the vacuum dehydration oil dried faster with less after tack and better water resistance than those prepared in (I) and alkyds prepared from the oil had less frosting tendency and were nearly comparable to linseed oil alkyds. The use of dehydrated castor oil in linseed oil alkyds increases water resistance but decreases drying rate and ease of brushing.

COMPOSITION OF SUNFLOWER OIL. H. Nobori. *J. Soc. Chem. Ind., Japan 44,* 705-6 (1941). Oil from the seeds of *Helianthus annuus,* cultivated in Japan, contained the acids: myristic 0.55%, palmitic 4.38%, stearic 4.37%, arachidic 0.54%, oleic 33.71%, linoleic 56.45%, and linolenic a trace. (*Chem. Abs. 42,* 2118.)

PETROLEUM DRYING OILS FOR INKS. F. J. Smith and R. J. Lee (Pan Am. Chemicals Div., New York, N. Y.). *Am. Ink Maker 25,* No. 12, 29, 31, 33 (1947); *26,* No. 1, 35, 37, 39, 49 (1948). (*Chem. Abs. 42,* 2113.)

MICROANALYTICAL DETECTION OF OLEIC AND LINOLEIC ACIDS IN FATS AND OILS. G. Gorbach and H. Malissa (Tech. Hochschule, Graz, Austria). *Mikrochemie ver. Mikrochim. Acta 33,* 145-8 (1947). The fat is converted to K soaps and oxidized with a 1.5% solution of $KMnO_4$ at room temperature. The insoluble oxidation products are acidified, washed with hot water, dried, and washed with petroleum ether. Dihydroxystearic acid (m.p. 130, acid No. 177) derived from oleic acid is separated by extraction with ether and sativic acid (m.p. 170, acid No. 160) derived from linoleic acid recovered as a precipitate. Both acids are recrystallized from 92% alcohol. (*Chem. Abs. 42,* 1748.)

AMERICAN CHEMISTS' WARTIME CONTRIBUTION TO DRYING OILS. A. C. Schwareman. *Official Digest Federation Paint & Varnish Production Clubs 279,* 325-6 (1948).

NEWER SYNTHETIC DRYING OILS. D. D. Razzano (Hilo Varnish Corp., Brooklyn, N. Y.). *Am. Paint J. 32,* No. 29, 70-86 (1948).

ALKYD RESIN TECHNOLOGY. C. L. Levesque (The Resinous Products and Chemical Co.). *Official Digest Federation Paint & Varnish Production Clubs 278,* 245-60 (1948).

THE USE OF LOW-TEMPERATURE CRYSTALLIZATION IN THE DETERMINATION OF COMPONENT ACIDS OF LIQUID FATS. IV. MARINE ANIMAL OILS. THE COMPONENT ACIDS AND GLYCERIDES OF A GREY (ATLANTIC) SEAL. T. P. Hilditch and S. P. Pathak (Univ. of Liverpool). *J. Soc. Chem. Ind. 66,* 421-5 (1947). The blubber oil of a grey seal *(halichoerus grypus),* iodine value 162, saponification equivalent 294, was fractionated by low-temperature solvent crystallization. The mixed acids analyzed 1.6% myristic, 10.5% palmitic, and 2.0% stearic, and 1.6% C_{14}, 5.5% C_{16}, 30.8% C_{18}, 16.5% C_{20}, 18.1% C_{22}, and 1.3% C_{24} unsaturated acids. The glycerides were of the mixed type characteristic of marine oils.

ESTERS OF TITANIUM. II. TITANIUM-MODIFIED OILS AND PHENOLIC RESINS. I. Kraitzer, K. McTaggart, and G. Winter. *Australia, Dept. Munitions, Paint Notes 2,* 348-56 (1947). Titanium was introduced into drying oils through butyl titanate by ester interchange. Paint films therefrom showed less tendency to chalk and more tendency to crack than those from the original oil. In alkyds titanium produces a hard film. (*Chem. Abs. 42,* 2114.)

PRACTICAL HINTS ON THE PREPARATION OF ALKYD RESINS. H. Hadert (Wandlitz, Berlin, Germany). *Paint Manuf. 18,* 5-10 (1948). The effects of a number of acids and glycols on the preparation and properties of alkyd resins are described.

PATENTS

CONCENTRATION OF UNSATURATED FAT GLYCERIDES BY DISTILLATION. A. Abbey. *Brit. 593,569.* When oils are treated with steam under vacuum of 10 to 200 mm., the saturated fat acids are split and distilled out first, then the fat acids with one double bond and the residual fatty glyceride contains more than one double bond per molecule. (*Chem. Abs. 42,* 1751.)

PREPARATION OF IMPROVED DRYING OILS. E. S. Barnitz (Distillation Products, Inc.). *U. S. 2,437,343.* A drying oil is treated to remove nonpolymerizable constituents, heat bodied and subsequently subjected to molecular distillation to separate a substantial portion of the unpolymerized oil. The undistilled portion is an improved drying oil.

EMULSIONS CONTAINING A DRYING OIL-ESTER RESIN COPOLYMER. W. H. Butler (Bakelite Corp.). *U. S. 2,437,293.* An ester obtained by reacting a cyclopentadiene-maleic adduct, a fatty acid, and a polyhydric alcohol is copolymerized with a drying oil and the product incorporated in an aqueous emulsion.

SEPARATION OF NEUTRAL FAT FROM TALL OIL. A. G. Houpt (Amer. Cyanamid Co.). *U. S. 2,437,643.* The fatty acids and rosin acids of tall oil are neutralized in the presence of a hot alcoholic solvent in which the fatty acid alkali soaps are insoluble in the cold. After separation of the fatty acid soaps the remaining solution is acidified with sulfuric acid in the presence of anhydrous alcohol and heated to esterify residual fatty acids and isomerize the rosin acids to crystallizable forms. The esters and acids are extracted with naphtha and the acids neutralized and separated as an aqueous layer.

Soap

Edited by LENORE PETCHAFT

RAPID DETERMINATION OF FAT ACIDS IN SOAPS. H. Wachsmuth and R. Robeyns. *J. pharm. Belg. 2,* 289-91 (1947). The acids are liberated with H_2SO_4 in a Gerber tube containing the sample and 1 cc. of AmOH and, after centrifuging and warming to 70°, the units are read in the graduated portion. Multiplication by a factor gives the percentage of fat acids in the soap. The time required is about 15 min. (*Chem. Abs. 42,* 2789.)

PREPARATION OF ALUMINUM DI-SOAPS. Gerould H. Smith, Harold H. Pomeroy, Charles G. McGee, and Karol J. Mysels (Stanford University, California). *J. Am. Chem. Soc. 70,* 1053-4 (1948). Aluminum dilaurate, dicyclohexanecarboxylate, moderately pure dioleate, distearate, and a product intermediate between dinaphthenate and mononaphthenate were prepared by aqueous precipitation, followed by thorough extraction with dried isooctane or acetone. The original precipitates, at least of the first three, are aluminum di-soaps, together with free or loosely bound molecular fatty acid.

EFFECT OF SALTS ON THE SOLUBILIZATION OF INSOLUBLE ORGANIC LIQUIDS BY CETYLPYRIDINIUM CHLORIDE. Paul H. Richards and James W. McBain (Stanford University, California). *J. Am. Chem. Soc. 70,* 1338-42 (1948). Solubilization of organic liquids in solutions of the cationic detergents cetylpyridinium chloride and Emulsol 607L, and the non-ionizing Triton X-100 have been determined. The results, in general follow the same order for different liquids, as three other detergents, dodecylamine hydrochloride, sodium oleate, and potassium laurate. The non-ionic detergent Triton X-100 was the poorest solubilizer and the best were the cationic cetylpyridinium chloride and dodecylamine hydrochloride. While all previous studies have shown that added salts greatly enhance solubility, and this was confirmed for the solubilization of benzene and octane by cetylpyridinium chloride, it is found that the solubilization of the polar compounds, octyl alcohol and benzaldehyde, is greatly depressed by the addition of sodium potassium chloride. It is suggested that while with hydrocarbons and many other organic liquids solubilization occurs in the hydrocarbon portion of the micelles, with these polar compounds the solubilization occurs at the polar ends of the detergent molecules in the micelles.

INVERT SOAPS. Ferenc Korosy. *Kem. Lapja 4,* 117-23 (1943). A review of technical applications of invert soaps. 30 references. (*Chem. Abs. 42,* 2789.)

CLARIFYING LIQUID SOAP. E. G. Thomssen. *Soap Sanit. Chemicals 24,* No. 4, 44-6 (1948). Methods of clarifying liquid soaps are reviewed. Filtration is one of the main processes commonly employed. However, temperature of fluid soaps must be reduced prior to filtration. The use of vacuum refrigeration operating with a steam jet vacuum pump for this purpose is described.

WATERLESS HAND CLEANERS. Milton Lesser. *Soap Sanit. Chemicals 24,* No. 4, 48-50, 181 (1948). The development of waterless hand cleaners is reviewed. Formulations using soap, a combination of soap and synthetic detergents such as the Nacconols, or the new synthetics alone or with such adjuncts as carboxymethylcellulose or the polyethylene glycols, are given. 22 references.

RAYON ECONOMIES WITH A SYNTHETIC DETERGENT C. M. Morgan (Allied Chemical & Dye Corp., New York). *Rayon Textile Monthly 29,* No. 4, 95-6 (1948). The properties of synthetic detergents which make them more economical than soap are reviewed. Savings come, not only because of their lower unit cost, but also from operating changes which may be brought about by their use. These include reduced hot water requirements and reduced processing time due to the ability of synthetics to function under acid, neutral, or alkaline conditions. They are applicable in essentially all wet processing operations, including spinning, scouring, dyeing, and finishing.

SOAPS AND SYNTHETIC DETERGENTS. J. P. Sisley (Inst. tech. etudes recherches corps gras, Paris). *Olearia 1947,* 223-33. (*Chem. Abs. 42,* 2789.)

ELECTROLYTE BUILDERS FOR SURFACE ACTIVE AGENTS. J. C. Harris (Monsanto Chem. Co., Dayton, Ohio). *Am. Dyestuff Reptr. 37,* 266-70 (1948). Addition of ionic electrolytes to anionic surface active agents can effect the following changes: reduce surface and interfacial tension, reduce critical conductivity, improve wetting speed, increase lather, and increase detergency. Addition of anionic electrolytes (silicates, phosphates, etc.) to cationic surface active agents in general results in inactivation of the agent. Addition of cationic electrolytes (calcium and aluminum chloride) in general exhibits only slight effect. Addition of ionic electrolytes to a nonionic surface active agent results in essentially no effect upon wetting. The

valence of the added anionic or cationic builder has marked effect upon the physico-chemical properties of anionic surface active agents. Markedly smaller amounts of polyvalent anionic or cationic builders are required to produce a given change in property. Excessive amounts beyond optimum generally result in significant reduction in surface activity. Builders for anionic surface active agents which hydrolyze to yield alkaline or acid solutions are better builders than those which provide essentially neutral solutions. Builder addition to anionic agents to produce a given result can decrease the quantity of surface active agent from 2 to 10 fold.

NEW CONCEPTS AND TRENDS IN THE DETERGENT FIELD. A. M. Schwartz (Harris Research Laboratories, Washington, D. C.). *Soap Sanit. Chemicals 24*, No. 4, 51-3, 181 (1948). General review article emphasizing such points as selection of individual detergents or combinations of them for specialized processes, the use of builders with detergents, analysis of types of detergents, and review of German detergent developments.

A NEW SYNTHETIC BAR DETERGENT IS PRODUCED. Anon. *Mfg. Chemist 19*, 153-8 (1948). Bar detergents have the practical advantages over liquids and powders of being less wasteful, requiring no packaging and less storage and transport space. The development of the new bar "Novosope" is reviewed. The manufacturing process consists in micropulverizing sodium acid phosphate, mixing with Teepol (secondary alkyl sulphate), precipitating essentially pure Teepol with the aid of a trace of sodium thiosulphate, adding further quantities of sodium acid phosphate, an alginate to act as a gel-forming binder, sodium sulphate to absorb the balance of free water, a trace of alkyl aryl sulphonate to increase lathering, lanolin to enhance smoothness of the tablet and partly offset the strong detergent action of the Teepol, and a floral perfume to mask the odor. After plodding and stamping, the tablets are brushed with a dilute alginate solution to prevent efflorescence.

APPLICATION RESEARCH METHODS FOR SYNTHETIC DETERGENTS. L. H. Flett (National Aniline Division, Allied Chemical & Dye Corp., New York). *Chem. Eng. News 26*, 1368-70 (1948).

DETERGENTS FOR AUTOMATIC WASHING MACHINES. C. A. Tyler. *Soap Sanit. Chemicals 24*, No. 4, 41-3, 95, 97 (1948). The types and operation of various automatic washing machines were reviewed. Machines discussed include the Bendix, Launderall, Laundromat, General Electric Washer, Thor, Automagic, Kenmore, Apex, and A-B-C-Omatic. The problems involved in formulating a detergent for these machines are also reviewed. Excess suds cause slowing up of the mechanical action of the machine, convert nearly all of the water into suds which of itself has no cleansing action, the drain pump will pull off liquid only, not suds, and oversudsing will cause the normal rinse cycle to be inadequate. However, when a nonsudsing detergent is used, the usual way of telling that rinsing is complete (end of sudsing) is lacking. When soap is used, it should be a fairly high-titre soap to work at the high water temperatures required. In using soap plus alkaline builders, care should be taken to avoid corrosion of aluminum parts of the machine. Hygroscopic detergents should not be used so as to avoid the formation of clumps which do not dissolve. Hard water creates the problems of the use of excess detergent, use of water softeners, or the redeposition of soil if the above are not employed. The comparative costs of home washing with the wringer-type machine and the automatic type as compared with professional laundries or self-service laundries are given.

PATENTS

IMPROVEMENTS IN DETERGENTS FOR THE WASHING OF TEXTILES. Lever Brothers & Unilever Ltd. *Brit. 584,484*. Detergents useful in washing textiles to prevent yellowing of fabrics are prepared by incorporating in them blue-fluorescent substances such as a di-benzoylaminostilbenesulphonic acid or derivatives which are substantive to the textiles being washed.

CONTINUOUS SOAP BAR MANUFACTURE. Lever Brothers & Unilever Ltd. *Brit. 597,322*. Continuous process of making soap bars or tablets by rapidly chilling molten 63% soap so as to solidify the soap within a few seconds, and then without subjecting the soap to a drying process, plodding and milling the soap and compacting it in the plodding process.