Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

Solvent extraction of vegetable oils. S. E. Tray and C. W. Bilbe (Allis-Chalmers Mfg. Co., Milwaukee, Wis.). *Chem. Eng. 54,* No. 5, 139-41, 153 (1947). Plant layout, solvents, building, fire, piping, and automatic control are discussed.

Some notes on the extraction of palm oil. Ch. Vanneck. *Bull. Agr. Congo Belg. 38,* 75-102 (1947). The extraction of palm oil by the wet process is discussed under the titles of composition, preparation of the pulp, digestion, decantation, boiling, etc. Production of palm oil of low acidity. *Ibid.* 103-120. Details of sterilization to prevent enzyme action are discussed.

Chemical examination of the seeds of wrightia tinctoria. Chemical examination of the fixed oil. D. Bal Parihar and S. Dutt (Delhi Univ.). *J. Indian Chem. Soc. 23,* 307-10 (1946). The seeds of this deciduous tree contain 30.5% oil with d^{24} 0.9552, n^{24} 1.4940, saponification no. 180.1, I no. 87.6, Ac no. 11.26, acid no. 4.31, R-M. no. 0.81, unsaponifiable 1.42%. The acid composition of the oil is myristic 0.07, palmitic 8.65, stearic 18.24, arachidic 5.82, oleic 33.98, and linoleic 31.82%.

Changes in fats and oils during freezing and thawing. Anon. *Food Industries 19,* 632-3 (1947). Margarine and shortening solidified at freezing temperatures, salad oil clouded, mayonnaise and salad dressing thickened and the oils separated. These conditions disappeared when normal temperatures were again reached.

Oxidative rancidity and the use of antioxidants. R. W. Riemenschneider (Eastern Regional Research Lab., Philadelphia, Pa.). *Trans Am. Assoc. Cereal Chemists 5,* 50-63 (1947). The oxidation of fats, stability, role of antioxidants and the practical considerations in their use, importance of quality of substrate, importance of amount and type of unsaturated fat components, oxidative deterioration in cereal products, and factors influencing the stability of crackers are discussed.

The use of antioxidants in edible fats and oils. W. O. Lundberg. *Hormel Inst. Ann. Report,* 1945-6, 33-9. Rancidity may develop in fats containing antioxidants before the antioxidant has been destroyed, particularly at higher concentrations. This is true of catechol even at 0.02% concentration. All the antioxidants studied catalyze peroxide formation at the higher concentrations. Although all the antioxidants are approximately equal in the duration of their effects at 0.02% concentration, with NDGA being destroyed in the shortest time, there are major differences at higher concentrations, catechol and hydroquinone being particularly durable at 0.5% concentration. NDGA, on the other hand, is the most lasting and effective of these antioxidants at 0.01% concentration, as has been shown previously. Gallic acid exhibits a peculiarity in its deterioration curve in that the curve is S-shaped. This is apparently due to the synergistic effect that the gallic acid exerts upon itself. As the gallic acid is gradually destroyed, its synergistic effect decreases, thus contributing to an even more rapid destruction of the remaining gallic acid. In the case of combinations of NDGA with citric acid and with methionine, the NDGA deterioration curves are not only prolonged but are somewhat different in shape from those obtained with 0.02% of NDGA alone. This is attributable to the gradual destruction of the citric acid and the methionine. Citric acid was found to have no detectable deleterious effect upon NDGA in lard at 375° F. in the presence of N_2.

The acute and chronic toxicity of nordihydroguaiaretic acid. E. M. Cranston, M. J. Jensen, A. Moren, T. Brey, E. T. Bell, and R. N. Bieter (Univ. Minnesota, Minneapolis). *Federation Proc. 6,* 318-9 (1947). The acute toxicity of nordihydroguaiaretic acid (NDGA) was found to be less than that of phenol and catechol on oral administration to mice, rats, and guinea pigs and intraperitoneally in mice. Orally in guinea pigs and intraperitoneally in mice, NDGA was more toxic than gum guaiac. Orally in mice and rats both NDGA and gum guaiac were relatively non-toxic.

The phosphorous-containing lipides of the carrot. D. J. Hanahan and I. L. Chaikoff (Univ. California Med. School, Berkeley). *J. Biol. Chem. 168,* 233-40 (1947). The P-containing lipide isolated from the raw carrot was characterized by a low N content and by an absence or low content of choline; that isolated from the steam-treated carrot was higher in its choline and N content. An explanation of the isolation of the 2 types of P-containing lipides from carrots is presented. It is postulated that the raw carrot contains an enzyme, probably a lecithinase, able to split choline from phospholipides.

The electrical conductivities of aqueous solutions of mixtures containing alkylammonium chlorides. A. W. Ralston and C. W. Hoerr (Armour & Co.). *J. Am. Chem. Soc. 69,* 883-6 (1947). The equivalent conductivities of aqueous solutions of mixtures of dodecyl- and octadecylammonium chlorides and of hexyl- and octadecylammonium chlorides have been determined. In the former mixtures the micelles are apparently composed of both components. Although the conductivity values of the latter mixtures are intermediate between those of their components the concentration of octadecylammonium chloride at the critical point is not influenced by the presence of hexylammonium chloride. This indicates that hexylammonium chloride is not included in the micelles. The presence of long-chain non-electrolytes lowers the conductivity and also the critical concentration of aqueous solutions of dodecylammonium chloride, thus suggesting that such nonelectrolytes are included in the micelles.

A study of sex differences in the composition of rats, with emphasis on the lipid component. Sex difference in susceptibility to essential fatty acid deficiency with high and low fat diets. H. G. Loeb (Kabat-Kaiser Inst., Washington) and G. O. Burr. *J. Nutr. 33,* 541-51 (1947). Male and female albino rats were raised on 3 simplified diets: the control diet contained 20% lard while the other 2, deficient in essential fatty acids, were fat-free and rich in saturated fat (hydrogenated coconut oil), respectively. The composition of these individuals in terms of total lipid, total non-lipid solids, and water content was determined in addition to the unsaturation of body fat. Evidence was presented showing that on a high-fat diet deficient in essential fatty acids females store more fat than males, and it was adduced that the latter are more sensitive to a deficiency in essential fatty acids than the females when both derive the bulk of their calories from fat. Rats receiving a diet very high in saturated fat, but lacking essential fatty acids, are unable to effect an appreciable increase in the amount of total body lipid, but they readily exchange the dietary fatty acids with those in the tissues.

THE EFFECT OF FAT LEVEL OF THE DIET ON GENERAL NUTRITION. I. GROWTH, REPRODUCTION, AND PHYSICAL CAPACITY OF RATS RECEIVING DIETS CONTAINING VARIOUS LEVELS OF COTTONSEED OIL OR MARGARINE FAT AD LIBITUM. H. J. Deuel, Jr., E. R. Meserve, E. Straub, C. Hendrick, and B. T. Scheer (Univ. So. California School Med., Los Angeles). *J. Nutr., 33,* 569-82 (1947). *Ad lib.* feeding to rats of diets varying in fat content from 5-50% (10-70% of total cal.) results in better growth, greater physical capacity, and better reproductive and lactation performance in rats than does feeding of diets containing minimal amounts of fat. The difference is not influenced by presence of Me linoleate in the fat-free diet. Optimum growth was observed on diets containing 20-40% fat. The most pronounced differences were observed in males. The effects are in part, but not entirely, attributable to greater caloric intake on the diets containing fat. II. GROWTH, MORTALITY, AND RECOVERY IN WEANLING RATS MAINTAINED ON RESTRICTED CALORIES. B. T. Scheer, D. F. Soule, M. Fields, and H. J. Deuel, Jr. (Univ. So. California, School Med., Los Angeles). *Ibid.* 583-92. During a period of severely restricted feedings, weanling rats receiving isocaloric amounts of diets varying in fat content grow better on diets containing fat than on a similar diet lacking fat. Mortality, from uncertain causes, was highest on the diet with 5% fat. During a recovery period of *ad lib.* feeding, growth, fertility, and lactation were better supported by diets with liberal amounts of fat than by a fat-free diet.

δ-TOCOPHEROL. I. ISOLATION FROM SOYBEAN OIL AND PROPERTIES. M. H. Stern, C. D. Robeson, L. Weisler, and J. G. Baxter (Distillation Products, Inc., Rochester). *J. Am. Chem. Soc. 69,* 869-74 (1947). A newly recognized tocopherol, called δ-tocopherol, has been isolated from soybean oil. δ-Tocopherol produces more color with the ferric chloride-dipyridyl reagent on a molecular basis than α-, β-, and γ-tocopherols, which causes errors in assaying mixtures of tocopherols containing δ-tocopherol unless a proper correction is made. δ-Tocopherol constitutes approximately 30% of the mixed tocopherols in soybean oil, 5% of those in wheat germ oil, and there is evidence of its presence in cottonseed and peanut oils. Certain properties of δ-tocopherol are described. It was found to be the most active of the tocopherols as an antioxidant for vitamin A acetate and β-carotene. It was the most resistant to atmospheric oxidation. It had only .01 of the activity of natural α-tocopherol in the Evans resorption sterility test for vitamin E. Its ultraviolet absorption, its infrared spectrum, its optical rotation, its reaction with diazo reagents, and the nature of its oxidation products formed with $AgNO_3$, HNO_3, and $AuCl_3$ are described.

A FAT-SOLUBLE MATERIAL FROM PLASMA HAVING THE BIOLOGICAL ACTIVITIES OF BIOTIN. W. Trager (Rockefeller Inst. Med. Research, Princeton, N. J.). *Proc. Soc. Exptl. Biol. Med. 64,* 129-34 (1947). The plasma of various species of animals yields, after hydrolysis with acids or enzymes, a fat-soluble material capable of replacing biotin in the growth of *Lactobacillus casei* and other lactic acid bacteria but not inactivated by avidin. When injected in chickens the material protected them from the injurious effects of a diet high in egg-white. Preparations containing the active material were found to be hemolytic, and in preliminary fractionations the growth and the hemolytic activities have gone together. The properties of the material do not correspond to those of oleic acid or of any previously described vitamers of biotin.

EFFECT OF DIHYDROXYSTEARIC ACID ON VITAMIN K SYNTHESIS BY RATS. G. Nightingale, E. E. Lockhart, and R. S. Harris (Massachusetts Inst. Tech., Cambridge). *Arch. Biochem. 12,* 381-7 (1947). A triglyceride containing dihydroxystearic acid produced a vitamin K deficiency within 30-60 days when fed to weanling rats. No measurable vitamin K was present in the intestinal tracts of rats fed a triglyceride containing dihydroxystearic acid, indicating that the intestinal synthesis of vitamin K was arrested. The deficiency syndrome was not the result of a bactericidal or bacteriostatic action by the dihydroxystearic acid, for the kinds and numbers of intestinal bacteria were not affected. Dihydroxystearic acid affects the vitamin K metabolism of bacteria, presumably by blocking the biochemical system involved in the synthesis of vitamin K.

FACTORS AFFECTING CARCINOGENESIS. III. THE EFFECT OF HYDROGENATION OF LIPID SOLVENTS ON CARCINOGENESIS BY 3,4-BENZOPYRENE. F. Dickens and H. Weil-Malherbe (Roy. Victoria Infirmary, Newcastle-upon-Tyne, Eng.). *Cancer Res. 6,* 161-70 (1946). The incidence of tumors resulting from subcutaneous injection of 0.3 mg. 3,4-benzopyrene (I) in mice was higher when I was dissolved in mouse fat or hydrogenated mouse fat than when it was dissolved in cod-liver oil or hydrogenated cod-liver oil, all containing 50% tricaprylin, or was dissolved in tricaprylin alone. Hydrogenation of the solvent significantly increased tumor incidence in the mouse fat series, insignificantly decreased it in the cod-liver oil series. IV. THE EFFECT OF TRICAPRYLIN SOLUTIONS OF CHOLESTEROL AND PHOSPHOLIPIDES. *Ibid.* 171-8. Tumor incidence was significantly increased by the presence of 3% of cholesterol and apparently decreased (statistical significance remains to be proved by a larger number of observations) by the presence of 1.5% of lecithin and 1.5% of cephalin, in the tricaprylin employed as solvent for the subcutaneous dose of 0.3 mg. I. Elimination of I was accelerated by cholesterol and inhibited by the phospholipides. The association of rapid elimination with high carcinogenicity may perhaps be due to a need for oxidative metabolism of the carcinogen before its effect can occur. (*Chem. Abs. 41,* 197-8).

SYNTHETIC LUBRICANT FLUIDS FROM BRANCHED-CHAIN DIESTERS. Physical and chemical properties of pure diesters. E. M. Bried, H. F. Kidder, C. M. Murphy, and W. A. Zisman (Naval Res. Lab., Washington, D. C.). *Ind. Eng. Chem. 39,* 484-91 (1947). This paper reports the development of diesters most suitable for use as synthetic lubricating fluids. The principal requisites were to secure chemically stable and noncorrosive fluids having freezing and pour points below —40° F., adequately low evaporation rates, low viscosities at —40° F., and low viscosity-temperature slopes (or high viscosity indices). From structural analogies and known rules relating molecular structure of hydrocarbons to their physical properties, it was concluded that long-chain and essentially aliphatic diester molecules were needed having 1 or more short-chain alkyl branches suitably positioned. 34 diesters were prepared, purified, and studied in this research program.

SYNTHETIC LOW TEMPERATURE GREASES FROM ALIPHATIC DIESTERS. G. M. Hain, D. T. Jones, R. L. Merker, and W. A. Zisman (Naval Res. Lab., Washington, D. C.). *Ind. Eng. Chem. 39,* 500-6 (1947). Good Li soap greases can be made from aliphatic diesters. A large number are now available for grease formulation. Greases with even lower plasticity numbers at —100° F. can be prepared. These diester greases are more reproducible than any greases known to this laboratory. Their non-corrosiveness, high oxidation stability, and low volatilities make them valuable for low temperature applications and for use in precision equipment and instruments. The rust preventive properties of these greases were not remarkable as is characteristic of Li soap greases containing no rust inhibitors. The most effective rust inhibitors found adversely affected the work stability of the greases. The diester greases were readily prepared by the well known fire kettle method, and should not present any serious manufacturing problems provided adequate care in formulation is exercised.

DEVELOPMENT OF ADDITIVES AND LUBRICATING OIL COMPOSITIONS. D. C. Atkins, H. R. Baker, C. M. Murphy, and W. A. Zisman (Naval Res. Lab., Washington, D. C.). *Ind. Eng. Chem. 39,* 491-7 (1947). Nonlubricant applications of the diester oil compositions include their use as dielectrics and as damping fluids.

LABORATORY MACHINE FOR THE CONTINUOUS PRODUCTION OF GREASE. DEVELOPMENT AND DESIGN. G. M. Hain and E. E. Stone (Naval Res. Lab., Washington, D. C.). *Ind. Eng. Chem. 39,* 506-7 (1947). A machine is described for the continuous production of 100 pounds of grease per day using a totally enclosed system. A viscose spinnerette pump forces the material through the system. A soap is heated in fluid slurry to 200° in a coil of fine-bore tubing whose walls are heated by a current of about 50 amperes. Cooling to a gel and shearing of the gel to a buttery grease are accomplished by forcing the hot liquid through a watercooled coil of the same dimensions as the heater. Additional shearing takes place in a worker section, using a gear pump to cycle grease through a perforated plate or screen.

PATENTS

FLAKING SUNFLOWER SEED FOR SOLVENT EXTRACTION. E. Levin. *U. S. 2,417,507.* Before flaking the seeds are heated at 80-120° to partially coagulate the protein.

STABILIZED FAT. P. Gyorgy (Wyeth, Inc.). *U. S. 2,420,238.* The fat is stabilized by a small effective amount of a mixture of monobenzyl ether of hydroquinone and a crude source of the vitamin B complex.

SEALING COMPOSITION. P. W. Millelot, Jr. (American Can Co.). *U. S. 2,419,224.* The sealing composition for food container joints contains Et cellulose, vegetable oil, a resin, Al silicate, TiO_2, and carbon black.

CORROSION PREVENTIVE COMPOSITION. G. L. Doelling (Wagner Electric Corp). *U. S. 2,420,127.* A composition of matter consists of blown castor oil, isopropanol, Ca, Na, and K ricinoleates, and water.

CUTTING OIL. J. H. Shipp and C. J. Pedersen (E. I. duPont de Nemours & Co.). *U. S. 2,420,328-9.* The product contains fatty oil distillation residue, pine oil alkyl phosphate, emulsifying agents, and water.

LUBRICATING GREASES. L. W. McLennan (Union Oil Co.). *U. S. 2,417,428-33.* The inventions relate to greases containing complex Ba, Ca, Sr, and Mg soaps, the complex being made up of inorganic salt and metal soap.

MANUFACTURE OF GREASE. H. G. Houlton (The Girdler Corp.). *U. S. 2,417,495.* This invention is an improved continuous process for making grease, by the intermixing and blending of mineral lubricating oil and a stiffening agent.

COMPOUNDED LUBRICATING OIL. J. G. McNab and D. T. Rogers (Standard Oil Development Co.). *U. S. 2,418,894.* A new lubricant anticorrosive comprises a reaction product of about 0.02-3 atomic proportions of elemental S with one molecular proportion of a metal salt of petroleum sulfonic acid.

LUBRICATING OIL COMPOSITION. J. G. McNab, C. J. Wilson, and C. Winning (Standard Oil Development Co.). *U. S. 2,419,360.* A lubricant for internal combustion engines comprises a mineral oil base, a small quantity, sufficient to impart detergent properties, of Ca octadecylate, and a small quantity, at least sufficient to offset the corrosiveness of the Ca octadecylate, of the product obtained by reacting *p*-cresol with isobutene in the presence of sulfuric acid as a catalyst.

EXTREME PRESSURE LUBRICANT. J. S. Yule and H. L. Moir (Pure Oil Co.). *U. S. 2,420,280.* Special sulfurized and phosphorized fat material are incorporated in the lubricant.

LUBRICATING COMPOSITION. A. J. Morway and J. C. Zimmer (Standard Oil Development Co.). *U. S. 2,420,902.* A lubricant composition for underwater craft contains trichlorobenzene, chlorinated diphenyl (48% Cl) Li soap of fish oil acids, and metallic soaps.

PROCESS FOR BREAKING PETROLEUM EMULSIONS. M. De Groote (Petrolite Corp., Ltd.). *U. S. 2,417,738-40.* The demulsifying agent used in the process consists of an oxidized dimer of 9,11,linolo-diricinolein and/or derivatives of the same.

Drying Oils

Edited by
HOWARD M. TEETER

HIGHLY UNSATURATED ACIDS. V. CONSTITUTION OF OCTADECATRIENOIC ACID, $C_{18}H_{30}O_2$, IN SARDINE OIL. T. Tsuchiya. *J. Chem. Soc. Japan 63,* 650-3 (1942). The Am ester of this acid oxidized in acetone gave mono-Am adipate, succinic acid, and a very small amount of volatile matter, probably acetic acid. From these results, the acid is presumed to be 6,10,14-, 6,10,13- or 6,9,13-octadecatrienoic acid. (*Chem. Abs. 41,* 3049.)

THE OXIDATION OF METHYL LINOLEATE AT VARIOUS TEMPERATURES. W. O. Lundberg and J. R. Chipault (Hormel Inst., Univ. Minnesota). *J. Am. Chem. Soc. 69,* 833-6 (1947). A study of the early stages of the autoxidation of pure Me linoleate at 40, 60, 80, and

100° has been made. With the exception of a small fraction which increases with the temperature, all of the absorbed O_2 is found as relatively stable linoleate peroxides. At the temperatures studied, and up to a level of oxidation of 300 m.e./kg. of peroxide, a constant fraction of the total peroxides is present as conjugated dienes. All of the conjugated dienes are present as peroxides. In addition, secondary products, absorbing at 2775 Å. and present in amounts increasing with the temperature, are formed in proportion to the O_2 uptake. These products are believed to be largely ketonic in character and to be produced in reactions concurrent with the formation of stable peroxides.

POLYMERIZATION OF DRYING OILS AND THE INFLUENCE OF SULFUR DIOXIDE UPON THIS PROCESS. D. Cannegieter. *Paint, Oil and Chem. Rev. 110,* No. 4, 17-18, 38, 40-1 (1947). The polymerization of linseed oil, with and without SO_2 as a catalyst, was studied from the point of view of reaction kinetics. Equations are derived which relate the increase in log viscosity to time. The bodying of tung and oiticica oils follow the same equations. It is concluded that the bodying both of slow- and of fast-bodying oils follows the same uniform mechanism and that SO_2 increases the rate of polymerization of slow-bodying oils by catalyzing the shifting of isolated double bonds into a conjugated system. (*Chem. Abs. 41,* 2913.)

PATENTS

TALL OIL TREATMENT. G. C. Harris (Hercules Powder Co.). *U. S. 2,419,211.* Rosin acids are separated from tall oil by dissolving the oil in a solvent such as acetone, isopropanol, gasoline or high-flash naphtha and precipitating the rosin acids at —10-50° with a primary amine such as cyclohexylamine, *p*-dodecahydroxenylamine and 2-amino-2-Me-1-propanol.

BLOWN WRINKLE VARNISH. W. A. Waldie (New Wrinkle, Inc.). *U. S. 2,419,238.* A wrinkle varnish base is made by heating unblown dehydrated castor oil and oil-soluble rosin-modified phenol-formaldehyde resin to approximately 580°F., discontinuing the heating, adding more unblown dehydrated castor oil, and heating to approximately 400° F. The temperature is then held at between 375 and 400° F. while blowing air through the mixture until a predetermined viscosity is obtained.

AIR DRYING MIXED ESTERS AND PROCESS FOR PREPARING SAME. R. Barthel (Bakelite Corp.). *U. S. 2,420,-694.* Air drying, oily mixed esters are prepared by reacting together a polyhydric alcohol, a monocarboxylic acid of not more than about 10 C atoms in the molecule and containing conjugated double bonds, and a non-conjugated drying oil acid.

Soaps

Edited by LENORE PETCHAFT

SOAP FROM SYNTHETIC FAT ACIDS. II. H. P. den Otter. *Chem. Weekblad 43,* 131-4 (1947). A review and discussion of the literature with 62 references. (*Chem. Abs. 41,* 3310.)

THE MAZZONI SOAP DRYING PROCESS. Casimiro Berti (Genoa, Italy). *Soap Sanit. Chemicals 23,* No. 5, 38-40 (1947). The process consists of a flashdrying of soap by first spraying it into a vacuum chamber, then causing it to adhere as a thick film to a metal surface where a high degree of heat transfer can be effected. The drying takes place in 2 steps: (1) the sensible heat of the soap is utilized during the time the soap, in mist form, passes from the nozzle to the walls of the vessel. The instantaneous evaporation that takes place with such a mist in a high vacuum converts the soap into extremely small pellets, and when the soap reaches the chamber walls, its temperature is approximately equal to the temperature of the system; (2) the drying takes place by the action of the heat transmitted through the walls. Diagram of the process is included. Special provisions are made for production of bar soap, soap powders, or flakes, perfumed soap, or soaps containing builders.

CRACKING OF MILLED SOAP. Anon. *Soap Sanit. Chemicals 23,* No. 5, 44-5, 85 (1947). Causes of milled soap cracking are reviewed. Factors to be considered include titer (soap having titer above 39° is difficult to mill), moisture content, homogeneity of the batch, thickness of the flake, faulty plodder pressure, unnecessary heating or chilling when flakes are passed through rolls, or mistakes in pressing.

PERFUMES FOR SOAPS. Charles Morel. *Soap, Perfumery, Cosmetics 20,* 48-53, 364-7 (1947). The chemical classification of perfume materials reviewed includes alcohols, aldehydes, acetals, ketones, acids, esters, ethers, phenols, lactones, nitro or amino compounds and terpenes. The importance of fixatives is emphasized. Methods of perfuming various types of soaps including washing soaps, cold process soaps, milled toilet soaps, novelty soaps, and synthetic detergents are reviewed. Tables listing perfumes suitable for white soap and colored soaps are included.

RATES OF SOLUTION OF SOAPS IN WATER. L. Shedlosky, G. D. Miles, and G. V. Scott (Colgate-Palmolive-Peet Co., Jersey City, N. J.). *J. Phys. & Colloid Chem. 51,* 391-407 (1947). A method for determining the rate of solution of soaps in water was applied to Na soaps of pure fatty acids and to several mixed soaps at temperatures from 10-70°. Soap cylinders were rotated at constant speed in a thermostated cell. The amount of soap dissolved was obtained from electrolytic conductivity, from evaporation of a solution to dryness, or by the use of an interferometer. In most cases, the rates follow a first-order equation, from which the saturation concentration which is approached can be calculated. These values were compared with estimates obtained from the electrolytic conductivities of soap solutions of increasing concentrations. Some typical rates of solution are shown for one soap in other soap solutions and in alkali chloride solutions at various pH values. NaCl and LiCl decrease the rate of solution of Na palmitate, whereas KCl increases the rate.

THE USE OF MEMBRANE ELECTRODES IN THE STUDY OF SOAP SOLUTIONS. C. W. Carr, W. F. Johnson, and I. M. Kolthoff (Univ. Minnesota, Minneapolis). *J. Phys. & Colloid Chem. 51,* 636-44 (1947). Recently developed collodion membranes have been used to determine ion activities in fatty acid soap solutions. With the use of negative collodion membranes the cation activity in solutions of Na and K soaps has been determined over wide ranges of concentration. It has been found that up to the critical point in a given concentration of a soap, the cation activity is the same as that at the same concentration of alkali chlorides. At the critical concentration the cation activity coefficient begins to decrease markedly with a further increase in concentration. This behavior is in accordance with what would be predicted from other measurements of physical properties of soap solutions, such as conductance and freezing-point lowering. A few measurements have also been made with positive collodion membranes of the activity of the anions in dilute solutions of Na laurate and Na caprate. From these experiments it is indicated that in very dilute solutions the apparent anion activity changes in the same way as in solutions of strong univalent electrolytes. However, long before the critical concentration is reached the apparent anion activity decreases very strongly. Further studies are planned to test the positive membranes for use with soap solutions.

BACTERICIDAL ACTION OF SOAP. K. Roelcke and Herm. Ph. Reichel (Univ. Heidelberg). *Z. Hyg. Infektionskrankh. 125,* 666-78 (1944). Soaps are not uniform in their bactericidal activity. Moreover against *Eberthella typhosa* only the salts of saturated acids of 8 to 18 C atoms have disinfectant action. The maximum reactivity occurs with acids of between 8 and 12 C atoms. The mixture of *p*-chloro-*m*-cresol and other phenolic soaps first increases and then decreases the bactericidal action of the solution. But with the salts of saturated acids of 8 to 14 C atoms the bactericidal power rises with increasing amounts of *p*-chloro-*m*-cresol. Also the soaps of naphthene and rosin show no weakening of activity under similar conditions. These facts suggest the possibility of preparing soap mixtures of greater bactericidal action. (*Chem. Abs. 41,* 2919.)

SULFATION OF OILS AND ALLIED SUBSTANCES. I. SULFATION OF DISTILLATION PRODUCTS FROM SODIUM OLEATE. Sei-ichi Uyeno and Rinnosuke Anzai. *J. Chem. Soc. Japan 63,* 978-82 (1942). The dry distillation of Na oleate from olive oil under atmospheric pressure in the presence of Na ethylate gives a petroleum-like product containing olefins but no acidic substance. This distillate redistilled under 12 mm. Hg gives a fraction boiling below 140°, I value $= 140.2$, $n_D^{20} = 1.4508$, and a fraction boiling 140-165°, I value $= 141.9$, $n_D^{20} = 1.4567$. Sulfation of a mixture of the 2 fractions gives a foaming agent. (*Chem. Abs. 41,* 3309.)

GELS AND JELLIES OF ALUMINUM DILAURATE IN CYCLOHEXANE AND BENZENE EXAMINED BY X-RAY DIFFRACTION. S. S. Marsden, Jr., K. J. Mysels, and G. H. Smith (Stanford Univ., Palo Alto, Calif.). *J. Colloid Sci. 2,* 265-9 (1947). $AlOH.L_2$, swells to a gel in cyclohexane without greatly disturbing the crystalline diffraction pattern of the soap. After heating and cooling the system, the lines of the pattern for the gel are less distinct but the spacings are the same as before. However, a jelly formed by heating a system of 40% $AlOH.L_2$ in benzene to 150° gives a pattern at room temperature that indicates the disappearance of the original crystallites of soap and the probable formation of micelles of oriented soap layers.

PATENTS

METHOD FOR PRESSING SOAP. D. F. Fischer (Colgate-Palmolive-Peet Co.). *Can. 439,866.* In a process for die-pressing soaps and other detergents, an improvement comprises introducing an inert powder material having a hardness below 6 on Moh's scale, between a detergent blank and the face of a die prior to applying the die face to the blank. The major portion of the powdered material should be finer than 200 mesh. The powder provides a substantially uniform film between the detergent blank and the faces of the dies.

SULFONATED FATTY AMIDE PRODUCTS. National Oil Products Co. *Brit. 567,911.* A sulfonated oil, or fatty acid, or fatty ester is treated with an amine, such as a primary, secondary, or tertiary amine, or tertiary organic N compounds, such as pyridine, in the presence of an NH_4 or amine mineral acid salt, as a catalyst, which accelerates the reaction so that amidification may be carried to completion before an appreciable loss of SO_3 takes place. The ingredients are heated for 0.5-1.5 hours at 100-250°. The process is particularly applicable to sulfonated materials of high SO_3 content containing less than 3% of water and about 0.2% of inorganic salts. The amide products thus obtained are readily soluble in oils of all types, form stable emulsions in aqueous media and are resistant to deterioration in storage. (*Chem. Abs. 41,* 2920.)

SURFACE-ACTIVE COMPOSITIONS. E. I. du Pont de Nemours & Co. (Imperial Chemical Industries Ltd.). *Brit. 568,102.* Surface-active compositions, comprising aliphatic and/or cycloaliphatic sulfonates are manufactured by hydrolyzing and neutralizing with aqueous caustic alkali aliphatic and/or cycloaliphatic sulfonyl halides. The latter are produced by the action of SO_2 and a halogen or a sulfuryl halide on normally liquid aliphatic and/or cycloaliphatic hydrocarbons. The resulting sulfonates are purified by extracting their aqueous solutions with a hydrocarbon or its inert derivative such as paraffin wax or naphthalene which is normally solid and melts at a temperature below the b.p. of the aqueous solution. (*Chem. Abs. 41,* 2920.)

SOAP-SYNTHETIC MIXTURE. E. A. Vitalis (American Cyanamid Co.). *Can. 440,225.* A detergent composition contains a major proportion of soap, together with a quantity of mild neutralizing agent sufficient to reduce the alkalinity of the soap to pH 7.2-8.0. Also present is 3-30%, based on the weight of the soap, of a surface-active agent having a single aliphatic radical of at least 8 C atoms. The surface-active agent is of the type of sulfonated fatty-acid amide.