material was heated to 200°C. at 0.02 mm. of Hg until no more distillation occurred. The distillate weighed 5.3 g., containing 5.5% of oleic acid. The residue was then taken up in benzene and decolorized with carbon, leaving 33 g. of methylglucoside mono-oleate. Yield, 72% of theory (based on methyloleate). Analytical data are reported in Table II.

α-Methylglucoside Dioleate: The mixture of 25.3 g. (0.13 mol) of methylglucoside, 77.4 g. (0.26 mol) of methyloleate and 0.4 g. of sodium methoxide was treated as outlined for the mono-oleate. There was obtained 90 g. of material which on vacuum distillation gave 18.4 g. of distillate (8.7% oleic acid) and 70 g. of residue, which analyzed for di-oleoylglucoside (yield 74% of theory) (Table II).

α-Methylglucoside Trioleate: A mixture of 59.2 (0.2 mol) of methyloleate, 9.7 g. (0.05 mol) of methylglucoside and 0.3 g. of sodium methoxide was treated as outlined above. The ester was obtained in a yield of 65% of theory. A ratio of six mols of methyloleate to one of glucoside gave the same product.

Attempted Hydrolysis of the Glucoside Oleates:

A) In aqueous hydrochloric acid.

A solution of α-methylglucoside (giving no Fehling test) was compared with a sample of di-oleoyl methyl glucoside at reflux in 0.1 N hydrochloric acid. After 30 minutes the methylglucoside solution gave a strong Fehling test. The ester was heated for an additional two hours, after which the aqueous layer gave a faint Fehling test. The water insoluble material was extracted with benzene and after evaporation of the benzene the residue was analyzed for dextrose equivalent (d.e.) and free fatty acids (f.a.). The d.e. was found to be 0.4%, thus showing a small amount of acetal hydrolysis; this value is equivalent to 1.4% of glucose di-oleate. The f.a. content was found to be 6% or more than four times the f.a. content of the starting material.

B) In alcoholic hydrogen chloride.

To a boiling solution of 10 g. of α-methylglucoside mono-oleate in 175 ml. of 0.1 N alcoholic hydrogen chloride, water was added dropwise until cloudiness occurred. A total of 33 ml. of water was added. On addition of a few drops of alcohol the cloudiness disappeared. After two hours reflux about 400 ml. of water was added and the material extracted with benzene in a continuous extractor. On evaporation of the benzene, 8.2 g. of residue was obtained which contained 8.5% of fatty acid (compared to 0.3% of the starting material) and gave no Fehling test.

Summary

1. Alcoholysis of triglycerides by methylglucoside gave an impure reaction mixture containing from 60-70% of glucoside-monoesters.

2. The mono-, di-, and trioleoyl methylglucosides were prepared by alcoholysis of methyloleate with α-methylglucoside.

3. Hydrolysis of the glucoside esters of fatty acids to dextrose esters could not be achieved. The ester linkage hydrolyzed in preference to the acetal linkage.

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☆ ☆ ☆ ABSTRACTS ☆ ☆ ☆

Oils and Fats

Edited by
M. M. PISKUR and MARIANNE KEATING

PUMPKIN SEED OIL. G. Salomone. *Olearia 2,* 91-2 (1948).

IMPROVEMENT OF THE CASTOR BEAN. THE CREATION OF VARIETY M_6. F. Cortesi (Univ. Perugia). *Olearia 2,* 79-84 (1948).

UTILIZATION OF FATTY ACID BY-PRODUCTS FOR LUBRICATION. M. Loury. *Oleagineux 3,* 136 (1948).

INFLUENCE OF RAIN ON THE CHARACTERISTICS OF PALM OILS. A. Devuyst. *Oleagineux 3,* 137-44 (1948).

MODERN EXTRACTION (RENDERING) OF ANIMAL FATS. M. Maillet (Etablessements OLIDA). *Oleagineux 3,* 131-3 (1948). Description illustration, method, economics, etc. of Titan rendering process are presented.

INDUSTRIAL CONDITIONS FOR WASHING EXTRACTED PEANUT OIL. J. P. Helme and P. Desnuelle (Faculte Sci., Marseille). *Oleagineux 3,* 121-5 (1948). The conditions for washing are: the water used is 3 times that of the amount of lecithin present plus that which may evaporate, temperature 80°, 45 minutes contact, pH near 5, stirrer should revolve 45 r.p.m., and the centrifuge should have a capacity of 600 liters per hour. The process precipitates 85% of the P present in the peanut oil. The washed oil is fairly well degummed for the residual dilution index is about 6. The precipitation of P, the dilution index, entrainment of oil in the emulsion, and oil losses are graphically represented as a function of the amount of water used.

SYNTHETIC FAT FROM PARAFFIN FATTY ACIDS. Review of technical and chemical problems. Georg Schiller (Badischen Anilin- u. Soda Fabrik, Ludwigshafen/Rhein). *Z. Lebensm.-Untersuch. u. -Forsch. 88,* 174-90 (1948). Review. 50 references.

THE FATTY ACID COMPOSITION OF GLYCERIDES. P. Cuvier. *Oleagineux 3,* 126-30 (1948). The method of calculating the fatty acid distribution in fats is given.

THE COMPONENT ACIDS OF HERRING VISCERAL FAT. T. P. Hilditch and S. P. Pathak (Univ. Liverpool). *Biochem J. 42,* 316-20 (1948).

MICROBIOLOGY OF FATS. O. Verona (Univ. Firenze). *Olearia 2,* 75-8 (1948). A review.

THE SYNTHESIS OF PALMITIC ACID AND TRIPALMITIN LABELED WITH CARBON FOURTEEN. W. G. Dauben (Univ. California, Berkeley). *J. Am. Chem. Soc. 70,* 1376-8 (1948). Palmitic acid and tripalmitin, labeled in the carboxyl C with C 14, have been prepared.

Palmitic acid, labeled at C atom 6 with C14, has been synthesized.

STUDIES IN VITAMIN A. 4. SPECTROPHOTOMETRIC DETERMINATION OF VITAMIN A IN LIVER OILS. Correction for irrelevant absorption. R. A. Morton and A. L. Stubbs (Univ. Liverpool). *Biochem. J. 42,* 195-203 (1948). The absorption spectra of pure vitamin A and vitamin A esters have been determined in cyclohexane, ethanol and 75% (v/v) aqueous ethanol. The results are expressed in terms of the fraction of $E_{max.}$ which corresponds to the absorption at different wave lengths between 250 and 400 $m\mu$. Experience gained in testing a wide range of fish-liver oils, including halibut, shark, hake, dogfish, and many mixed liver oils shows that irrelevant absorption at 328 $m\mu$. occurs in all, varying from 5-20% of the gross absorption. On the average the conversion factor of 1600 was fully justified if irrelevant absorption could not be allowed for, but the use of the factor of 1800 and of corrected E values permits the assay of individual oils with considerably improved precision.

DETERMINATION OF THE IODINE NUMBER OF CHINA WOOD OIL BY THE KAUFMANN METHOD. P. Savary and C. Ferrari. *Oleagineux 3,* 134-5 (1948). The Kaufmann bromine method was satisfactory for determination of I value of oils containing conjugated double bonds. One test on stearic acid indicated there was no appreciable substitution for a reaction time of 24 hours.

MARGARINES ARE UNAFFECTED BY LOW TEMPERATURE STORAGE. A. A. Kiess, R. W. Bates, and C. K. Wiesman (Armour & Co.). *Food Industries 20,* 716-18, 825 (1948). Margarines stored for 538 days at 5 and —10°F. kept original quality. Those stored at 28 and 45°F. were not marketable.

COMPONENT ACIDS OF THE LIPIDS OF HUMAN TUBERCLE BACILLI. PART I. N. Polgar (Dyson Perrins Lab., Oxford Univ.). *Biochem. J. 42,* 206-11 (1948). The scheme, which may be found of value in other connections, depends upon the fractional crystallization of derivatives, obtainable by converting the acids into acetol esters, $R\cdot CO_2CH_2\cdot CO\cdot CH_3$, and treating the latter with an appropriate reagent for ketones, such as semicarbazide or 2:4-dinitrophenylsemicarbazide. The acids isolated by this process include a saturated C_{19}-acid, resembling tuberculostearic acid in respect of the melting points of derivatives. The presence of an unsaturated branched-chain acid of high molecular weight is indicated by the isolation of its oxidation product; for the oxidation hydrogen peroxide in formic acid has been employed.

PATENTS

TREATING EDIBLE OILS. F. M. Sullivan. *U. S. 2,441,923.* In the process of treating an edible food glyceride oil are the steps of heating oil at a temperature of at least 200°C. during a re-solution heating period of not more than 180 minutes under conditions of temperature, time of treatment, and agitation insufficient to dissolve any sludge formed, and separating pyrolyzed bodies, and any formed sludge to produce an oil capable of being deodorized by steam distillation under vacuum, adding a small amount of fatty acids of melting point higher than those of the oil undergoing treatment and then alkali refining to produce an edible food oil.

ANTIOXIDANT. Kenneth C. D. Hickman (Distillation Products, Inc., New York). *U. S. 2,440,606.* The process of stabilizing an oxidizable substance comprises incorporating in the oxidizable substance an antioxidant comprising hydrogenated deodorizer scum.

HYDROXYLAMINE STABILIZED FATTY MATERIALS. Oscar L. Scherr. *U. S. 2,441,547.* The process of stabilizing a fatty material comprises incorporating therein a small amount of hydroxylamine.

SYNERGISTIC ANTIOXIDANT COMPOSITION OF THE ACIDIC TYPE. Roy W. Riemenschneider and Jack Turer. *U. S. 2,440,383.* An antioxidant composition comprises phospholipids and fatty acid esters of ascorbic acid.

PRODUCTION OF DEHYDRATED CASTOR OIL. George S. Monroe and Vladimir N. Ipatieff. *U. S. 2,439,982.* The process for dehydrating castor oil comprises contacting castor oil at a dehydrating temperature and superatmospheric pressure with a liquid catalyst consisting of an aqueous solution containing at least 1 weight per cent but less than 5 weight per cent of ammonium chloride.

METHOD OF POLYMERIZING NONWRINKLING OILS TO WRINKLING OILS. Gordon M. Williams. *U. S. 2,441,738-9.* The method of making a wrinkling oil from an ester of non-wrinkling oil fatty acids consists in heating an ester in an inert ambient atmosphere at a maximum temperature of 250°C. with allyl cobalt.

CUTTING OIL COMPOSITION. Jere C. Showalter (Standard Oil Co.). *U. S. 2,438,461.* A composition of matter capable of forming a substantially stable, non-foaming aqueous emulsion consists of a 2-5% metal salt of stearic acid and a NaOH neutralized sulfonated extract of a 200-Saybolt seconds viscosity at 100°F. naphthenic type petroleum oil.

PROCESS FOR BREAKING PETROLEUM EMULSIONS. Melvin DeGroote and Arthur F. Wirtel. *U. S. 2,442,073-7.* The invention comprises a process for breaking petroleum emulsions of the water-in-oil type, characterized by subjecting the emulsion to the action of an acidic partial ester containing: (a) at least one polyhydric alcohol radical; (b) at least one diglycollic acid radical; and (c) a plurality of acyloxy radicals.

LUBRICATING OIL COMPOSITIONS CONTAINING POLYMERIZED ALLYL ESTERS OF CARBOXYLIC ACIDS. Robert G. Larsen and Kenneth E. Marple. *U. S. 2,441,023.* A lubricating composition of improved viscosity index comprises a hydrocarbon mineral lubricating oil and 0.2-20% of a polymer of allyl laurate having a degree of polymerization of 4.3-12.1 obtained by heating and polymerizing allyl laurate at 50-300°C. in the presence of an organic peroxide polymerization catalyst.

LUBRICANT. Theodore G. Roehner and George W. Murray. *U. S. 2,441,720.* A soda soap lubricating grease characterized by resistance to deformation and "bleeding" comprises a sodium soap content of 36-50% and 0.5-10% of water dispersible methyl cellulose.

LUBRICATING OIL ADDITIVES. C. M. Himel *et al. U. S. 2,439,734.* An improved lubricant comprises a major proportion of a lubricating oil and as an oxidation inhibitor therefor an unsubstituted alkyl sulfenamide, said sulfenamide being present in an amount ranging from 0.01-5% by weight of said oil.

TREATMENT OF TALL OIL. Nicholas L. Kalman. *U. S. 2,441,197.* A method for treating tall oil comprises heating the tall oil in the presence of from

0.5-10% phosphorous acids, oxides, sulfides, chlorides, and oxychlorides at 250-350°, and distilling the volatile constituents of the tall oil to recover a product essentially consisting of a mixture of fatty acids and rosin hydrocarbons.

TALL OIL TREATMENT. Vigen K. Babayan. *U. S. 2,441,198.* A process for separating constituents of tall oil comprises preliminarily heating the tall oil with from .5-5% phosphorus pentoxide or ortho-phosphoric acid at 250-350°, distilling off the distillable constituents and during distillation maintaining a zone of distillate vapor temperature of 250-310°, the preliminary heating and distillation being carried on for a time and under conditions effecting complete decarboxylation of the rosin present in the tall oil taken from treatment to yield a distillate consisting of fatty acids and rosin hydrocarbons, and separating the fatty and rosin constituents of the distillate.

TREATMENT OF ROSIN. Arthur W. Hixson and Ralph Miller. *U. S. 2,439,807.* A method of refining rosin comprises dissolving rosin in liquid propane, elevating the temperature to a point above 70°, separating a lower liquid phase which forms at such temperature and recovering a clarified rosin from the remaining solution.

Drying Oils

Edited by
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DRYING OILS. PART 2: MODIFIED NATURAL OILS, SYNTHETICS. G. M. Sutheim. *Chem. Ind. 62,* 241-47 (1948). A review with 77 references.

THE COMPOSITION OF HUNGARIAN LINSEED OILS. I. Jakobey (Exptl. Instit. Growing Flax, Lin, and Oilseeds, Szeged, Hungary). *Kisérletügyi Közlemények 47/49,* 41-7 (1947). Hungarian flaxseed contained 2.90-5.48% of moisture and 40.37-42.08% of an oil of *n* 1.4864-1.4904, iodine number (Kaufmann) 177.46-181.0, thiocyanate number 113.76-116.86, saponification number 187.5-193.8, unsaponifiable 0.69-0.89%, saturated glycerides 10.04-16%, glycerides of oleic acid 15.74-16.39%, glycerides of linolic acid 29.34-32.75%, and glycerides of linolenic acid 41.50-44.88%. There were no differences in oils produced from seeds of different varieties grown in the same area on soils of different chemical and physical characteristics. High rainfall seems to increase the iodine and thiocyanate numbers, refractive index, saponification number, unsaponifiable content, to decrease the saturated fatty acid content, and to increase the amount of linolenic acid. (*Chem. Abs. 42,* 3194.)

TRANSESTERIFICATION OF LINSEED OIL WITH SEMIDRYING AND CRUCIFEROUS OILS. REUTENAUER (Lab. Chevreul, Paris). *Bull. mens. ITERG 1947,* No. 11, 32. Equal parts of linseed oil and colza oil or 20% linseed oil and 80% sunflower oil are heated for 7 to 10 hours in the presence of CO_2 without catalyst at optimum temperatures (200°, 180°) to obtain oils which dry faster than linseed oil and have about the same iodine number. Several catalysts were investigated but they produced a slower drying or viscous oil. (*Chem. Abs. 42,* 2448.)

OITICICA OIL. F. J. Hermann. *Centraal Inst. Materiaal Onderzoek, Afdel. Verf, Circ. No. 42* (1947). A review with 19 references. (*Chem. Abs. 42,* 2449.)

SEVERAL DIFFICULT INFRARED-DRYING PROBLEMS. M. Deribere. *Peintures, pigments, vernis 23,* 368-9 (1947). Linseed oil films containing cobalt driers dry faster under infrared treatment than their pigmented counterparts because natural antioxidants in the oil are destroyed faster in the case of the clear films. In some cases a short pretreatment with ultraviolet radiation reduces the infrared drying time of pigmented films. (*Chem. Abs. 42,* 2783.)

THE ACTIVATION OF LINSEED OIL WITH SULFUR DIOXIDE. H. I. Waterman, C. van Vlodrop and M. J. Pfauth (Univ. Delft, Holland). *Research (London) 1,* 186-92 (1948). Data on treatments of linseed oil with SO_2 at various temperatures, fractionation of the products and polymerization of good drying fractions are given. The conjugated oil produced by such treatment has a diene value of 13-26 and fixes phenol and binds HCl in the same manner as tung oil (*Chem. Abs. 42,* 2787.)

PATENTS

DRYING OILS FROM FAT ACIDS AND ACETYLENE. J. Rinse and W. Dorst. *Dutch 60,637.* Acetylene and fat acids are condensed in the presence of fat, oil and catalysts such as Zn or Cd compounds. The fat oil prevents gelatinization and allows regulation of the reaction. The product dries rapidly to give a very water-resistant film. (*Chem. Abs. 42,* 2785.)

REACTION PRODUCTS OF TALL OIL AND ALLYL COMPOUNDS. F. A. Bent and E. A. Peterson (Shell Development Company). *Brit. 587,557.* Tall oil is treated at 150-300° with monomeric or polymeric allyl alcohol or allyl esters to yield resinous materials. The reaction is an esterification or an ester interchange of the allyl polymer with the rosin and fatty acids in the tall oil. (*Chem. Abs. 42,* 2452.)

SYNTHETIC DRYING OILS. H. S. Bloch (Universal Oil Products Co., Chicago, Ill.). *U. S. 2,440,459.* A synthetic drying oil is prepared from an olefinic hydrocarbon stock by a combination of the following steps: (1) reaction with hydrogen fluoride to form a complex, (2) gravity separation of a hydrocarbon phase, (3) extraction of relatively saturated higher boiling hydrocarbons from the complex phase by means of a non-reactive solvent, (4) treatment of the remaining complex phase with water to separate therefrom a hydrocarbon drying oil.

SYNTHETIC DRYING OILS. W. W. Johnstone (Universal Oil Products Co.). *U. S. 2,440,477.* Similar to *U. S. 2,440,459* but including the step of alkali-neutralizing the recovered hydrocarbon drying oil.

SULFUR-CONTAINING COATING COMPOSITIONS. V. J. Frilette (Ridbo Laboratories, Inc., Patterson, N. J.). *U. S. 2,440,467.* Finely divided S is well dispersed in a drying or semidrying oil to form a coating composition. The amount of S is between 0.5 and 2% of the total non-volatile ingredients of the composition.

ADDITION PRODUCTS OF ACRYLONITRILE AND DRYING OIL ACID AND ESTERS. H. A. Bruson and W. D. Niederhauser (The Resinous Products & Chemical Co., Philadelphia, Pa.). *U. S. 2,440,140.* A monomeric product is prepared by the addition, at 80-300°C., of equimolecular proportions of acrylonitrile and conjugated drying oil fatty acids, esters, or alcohols.

TREATMENT OF DRYING OILS. H. G. Berger, G. S. Crandell, and J. F. Socolofsky (Socony-Vacuum Oil

Co.). *U. S. 2,440,000.* A drying oil is polymerized in the presence of a Friedel-Crafts polymerization catalyst, at about 300°F., until a Gardner-Holdt viscosity of Z-6 is attained. Polymerization is then arrested by the addition of water in an amount insufficient to form a separate phase, and a liquid coating composition is prepared by adding resin, thinner, and drier thereto.

Dibasic acid drying oils. L. D. Myers and V. J. Mukerheide (Emery Industries, Inc., Cincinnati, Ohio). *U. S. 2,440,667.* The non-drying constituents of a drying or semi-drying oil are replaced by an aliphatic di-carboxylic acid having a vapor pressure lower than that of the replaced constituents, to form a new drying oil.

Utilization of tall oil. M. K. Bare and W. Stubblebine (Armstrong Cork Co., Lancaster, Pa.). *U. S. 2,439,377.* A siccative oil is mechanically oxidized in the presence of a resin and at least 10% of tall oil until a useful gel is formed.

Manufacture of polymeric substances containing fatty oil acid radicals. D. H. Hewitt and F. Armitage (London, England). *U. S. 2,441,068.* A drying oil diglyceride and a polymethyl methacrylate are heated at 400-600°F. with an alcoholysis catalyst until an air-drying, polymeric substance is formed.

Soap

Edited by
LENORE PETCHAFT

Phase study of rosin soap-sodium silicate-water systems. R. C. Merrill and Raymond Getty (Philadelphia Quartz Co., Philadelphia, Penn.). *J. Phys. & Colloid Chem. 52,* 167-79 (1948). Solubility curves for the very soluble wood rosin and the less soluble hydrogenated rosin soap in water, and for the latter, in 0.025 *N* NaOH, show both similarities to and differences from those of long-chain fatty acid soaps. Ternary diagrams of the hydrogenated rosin soap with sodium chloride in water and in 0.025 *N* NaOH solution are qualitatively similar to those with fatty acid soaps but at low soap concentrations exhibit hitherto unreported behavior. Large amounts of a Na silicate with an SiO_2/Na_2O ratio by weight of 2.46 are incorporated into concentrated hydrogenated rosin soap systems without changing very much the phase behavior. Rosin makes it easier to incorporate large amounts of silicates in fatty acid soap systems by increasing miscibility and by providing a range of solidification temperature for the system.

The effect of alkaline electrolytes on micelle formation in soap solutions. Reynold C. Merrill and Raymond Getty (Philadelphia Quartz Company, Philadelphia, Penn.). *J. Phys. & Colloid Chem. 52,* 774-86 (1948). At equal Na-ion concentrations, solutions of NaCl, NaOH, Na-ortho or pyro-phosphate, Na tetraborate, Na metasilicate, and three Na silicates with silica-to-soda (Na_2O) ratios of 1.60, 2.46, and 3.93 lower the "critical" concentration for micelle formation in Na laurate solutions to the same extent. The data were obtained by the dye-titration method with pinacyanol chloride. Measurements of the solubilization of Orange OT in dilute Na and K laurate solutions at 60°C. alone and with four Na silicates confirm this result. The decrease in the "critical" concentration for micelle formation in soap solutions due to the salt is interpreted as a common-ion effect, in accordance with law of mass action. 19 references.

Electrical conductivity of crystalline and liquid-crystalline soap-water systems. R. D. Vold and M. J. Heldman. (University of Southern California, Los Angeles). *J. Phys & Colloid Chem. 52,* 148-166 (1948). A technique has been developed for determination of the electrical conductivity of solid and semi-solid soap systems. Resistances were determined as a function of temperature for Na stearate systems containing from 0 to 60 per cent water from room temperature to as high as 300°C. The results obtained permit derivation of details of the phase diagram in the region of high concentration, and show that none of the anhydrous phases studied can incorporate more than 3 or 4 weight per cent water without transformation to another phase. Results show that middle soap and soapboiler's neat soap have nearly identical values of specific resistance, which results in the equivalent conductivity of middle soap being much larger than that of soapboiler's neat soap. This result is in accord with the hypothesis that soapboiler's neat soap has a lattice-like structure, whereas middle soap is predominantly micellar in nature.

Colloidal structures in binary soap systems. Todd M. Doscher and Robert D. Vold (University of Southern California, Los Angeles). *J. Phys. & Colloid Chem. 52,* 97-109 (1948). A detailed examination of the binary systems of Na stearate-water and Na stearate-cetane has revealed a similarity in the phase relations in both systems. Both soapboiler's neat soap, which exists at high soap concentrations in the water system, and superwaxy soap, existing at high soap concentrations in the cetane system, appear to be fairly close-packed molecular structures which resemble the structures deduced for the anhydrous soaps. Both these phases may be considered to be a type of solid solution in which the water or cetane is dissolved in the soap and forms a part of the soap lattice. Aqueous and non-aqueous middle soaps which occur at lower soap concentrations appear to be micellar phases; that is, they may be regarded as being composed of fluid-like micellar aggregates of soap and the solvent component of the binary system. 33 references.

Critical micelle concentrations as determined by refraction. H. B. Klevens. *J. Phys. & Colloid Chem. 52,* 130-48 (1948). Refractive indices of dilute solutions of K laurate and Na dodecyl sulfonate at 35°C. and the critical micelle concentrations as determined by refraction of various fatty acid soaps, sodium alkyl sulfonates, and alkylamine hydrochlorides have been determined. The refractive indices of dilute soap solutions are characterized by two straight lines which intersect at the critical micelle concentration (C.M.C.). The critical micelle concentration of soap solutions is seen to increase with temperature. The addition of electrolytes to soap solutions decreases the critical micelle concentration.

Synthetic detergents and surface activity. Cornelia T. Snell (Foster D. Snell, Inc., New York, N. Y.). *Science Counselor 10,* 113-14, 138-9 (1947). The nature of cleaning, nature of surface-active agents, and types of surface-active agents are discussed. The more important types with examples of typical commercial products by trade names are included. Applications and properties are described. In distilled water soap is by far the most surface active of any of the agents studied. (*Chem. Abs. 42,* 3199.)

COLLOIDAL CRYSTALLITES AND MICELLES. I. THE MICELLE IN SOLUTION. APPARENT ANOMALIES IN THE SURFACE- AND INTERFACIAL-TENSION-CONCENTRATION CURVES OF AQUEOUS SOLUTIONS OF PARAFFIN-CHAIN SALTS. D. Reichenberg (Cambridge Univ. Eng.). *Trans. Faraday Soc. 43,* 467-79 (1947). Minima in the surface- and interfacial-tension-concentration curves of soap solutions are not to be expected if the materials used are pure. The minima found experimentally must be due to impurities. Assuming the impurities to be salts of multivalent ions present in the water used, the theory explains why the minima occurs at the critical concentration of the soap, and why a maximum is also shown sometimes. The lack of purity is capable of explaining the known experimental results better than any theory put forward hitherto. The treatment is based on the Gibb's equation, which is independent of any particular interpretation of the surface layer. (*Chem. Abs. 42,* 2838.)

AN X-RAY STUDY OF THE STEPWISE MELTING OF ANHYDROUS SODIUM PALMITATE. H. Nordsieck, F. B. Rosevear, and R. H. Ferguson (Procter and Gamble Co., Ivorydale, Ohio). *J. Chem. Phys. 16,* 175-80 (1948). X-ray powder patterns on anhydrous Na palmitate show that the 5 phases already known to occur between crystal and isotropic melt can be grouped into 2 basic structures. Both structures are liquid crystalline, *i.e.*, crystalline in the direction of the long spacing and liquidlike laterally. Between the lower temperature "waxy" structure, which includes the previously known subwaxy, waxy, and superwaxy phases, and the higher temperature "neat" structure, which includes subneat and neat, there is a pronounced break in the curve of long spacing vs. temperature; in addition the 3 waxy phases exhibit 2 diffuse short spacing rings, whereas the neat phases exhibit only one. These pattern differences lead to the interpretation that the waxy phases contain structural restraints on molecular position and motion not present in the neat phases. (*Chem. Abs. 42,* 3236.)

A CYLINDRICAL MODEL FOR THE SMALL SOAP MICELLE. Wm. D. Harkins (Univ. of Chicago). *J. Chem. Phys. 16,* 156-7 (1948). Idealized cross sections are given for soap micelles, with and without solubilized oil. The solubilization of an oil increases the number of soap molecules in the micelle. Although a cylinder represents most of the properties of the micelle now known, it is imperfect in that it represents too large an interface at the side between hydrocarbon groups and water. A model that lies between a cylinder and a cylindrical spheroid would better represent energy relations. This would amount to a distortion of the side of the cylinder so that polar groups would partially cover the non-polar hydrocarbon chains. The lamellar model is rejected. The cylindrical model is based chiefly on x-ray data. (*Chem. Abs. 42,* 3238.)

ACIDS OF LANOLIN. Edgar S. Lower. *Ind. Parfum 2,* 319-24 (1947). After tabulation of the m.p., neutralization equivalent and occurrence of 32 acids known to be present in lanolin, the properties and analysis of the commercial mixture of acids obtained by the saponification of lanolin are described. The approximate solubility of the commercial mixture in 100 organic solvents is given. Suggestions and directions are offered for the utilization of the mixture and its derivatives (e.g., sulfonates) in commercial products such as waxes, resins, detergents, and emulsifying agents. The properties of the soaps (especially those of K, Pb, and Ca) of the mixture are discussed and possible uses as wetting and emulsifying agents (oil-in-water type), catalysts in petroleum cracking, bases for pharmaceuticals, in modeling compounds, etc. Sulfonated derivatives are recommended for the treatment of leather. (*Chem. Abs. 42,* 3592.)

SOME CORRELATING PRINCIPLES OF DETERGENT ACTION. Walter C. Preston (Procter & Gamble Co., Ivorydale, Ohio). *J. Phys. & Colloid Chem. 52,* 84-97 (1948). Detergency curves are given showing the existence of a critical washing concentration which is characteristic of each detergent and which coincides with its critical concentration of colloid formation. Detergent action, colloid formation, and surface activity are different manifestations of the same characteristic of the detergent. The long-chain ion is the active constituent in each manifestation. Colloid formation begins, and washing power and surface activity reach their maximum, at the concentration at which further additions of detergent either (a) do not dissolve (at low temperature) or (b) dissolve to form colloid (at higher temperature), and thus in neither case is further increase in the number of long-chain ions in the solution possible. The critical washing concentration is essentially a function of the length of the non-polar "tail" of the detergent. Solubilization of foreign matter is a function of the colloidal micelle and plays a secondary role in the usual washing process. 21 references.

THE OSMOTIC BEHAVIOR OF SOME COLLOIDAL ELECTROLYTES AS DETERMINED BY MEANS OF THE HILL-BALDES VAPOR-TENSION APPARATUS. Manuel N. Fineman and James W. McBain (Stanford University, California). *J. Phys. & Colloid Chem. 52,* 881-96 (1948). The osmotic behavior of colloidal electrolytes, some of which are only slightly soluble in water at room temperature and hence cannot be studied by the usual cryoscopic methods at 0°C., has been investigated at 25°C. and at higher temperatures by means of a modification of the Hill-Baldes vapor-tension apparatus. Data thus obtained are reported for some anionic detergents such as the sodium and potassium salts of lauric, myristic, and oleic acids as well as for cationic detergents of the substituted ammonium and pyridinium halide types. The usefulness of the vapor-tension apparatus for studying the behavior of colloidal electrolytes is demonstrated. 29 references.

THE DERMATOLOGICAL ACTION OF SKIN CLEANSERS. Louis Schwartz. *Soap Sanit. Chemicals 24,* No. 5, 33-6, 159 (1948).

PATENTS

SYNTHETIC DETERGENT. Edryd Gwylfa Parry (Imperial Chemical Industries). *Brit. 594,838.* The detergent properties of the water-soluble salts of sulphuric acid mono-esters of B-monohydroxyethylamides of fatty acids of from 8 to 20 carbon atoms such as stearamidoethyl sodium sulphate in the presence of hard water or alkalies may be improved by the addition of unsulphated β-monohydroxyethylamides such as oleoethanolamide.