The part remaining in solution contains most of the linoleic acid. The precipitated acids are crystallized from ether (10 g. per ml.) giving a soluble fraction containing mainly oleic and linoleic acids with minor proportions of saturated acids, and an insoluble fraction consisting mainly of saturated acids and having an iodine number of 10-20, due, as a rule, wholly to oleic acid. (As a precaution this fraction should be examined spectrophotometrically for linoleic acid.) The crystallization from ether may be repeated. The various fractions are converted to methyl esters and fractionated, and the composition of the original fatty acids is calculated in the usual way from the iodine values and equivalents of the fractions obtained. Fractional crystallization of the methyl esters of the original fatty acids may also be employed, but the separation effected is less complete. The final analysis obtained is, however, satisfactory. The analyses obtained by these procedures compare well with those obtained by lead salt separation or spectrographic analysis.

TESTS FOR SUPPOSED ALPHA-DICARBONYL COMPOUNDS IN AUTOXIDIZED FATTY SYSTEMS. H. Jasperson, R. Jones and J. W. Lord. *J. Soc. Chem. Ind. 64,* 143-5 (1945). The colorimetric tests for alpha-dicarbonyl compounds proposed by Prill, O'Daniel and Parsons were applied to biacetyl, diketostearic acid, autoxidized methyl linoleate and autoxidized peanut oil. The colors obtained were examined spectroscopically. substances responsible for the color of autoxidized fatty systems are not necessarily dicarbonyls. (*Chem. Abs. 39,* 4503.)

SOME VARIATIONS IN SOLVENT-EXTRACTED TUNG OILS RESULTING FROM SOLVENTS EMPLOYED. R. S. McKinney and R. E. Oglesbee. *Proc. Am. Tung Oil Assoc., 1945,* 43-7. The quality of oil recovered is affected by the nature of the solvent. One heptane fraction yielded an oil which was solid at room temperature, while heptane from another source yielded oil that was almost entirely liquid at ice-box temperatures. Hexane fractions yield oils liquid at room temperature and solid in the cold. Trichloroethylene yielded excellent extracted oils. (*Chem. Abs. 39,* 4498.)

CHANGES IN LINSEED OIL FILMS DURING DRYING. G. Fearnley. *Can. Chem. Process Inds. 29,* 519-20, 530 (1945). A review with twelve references. (*Chem. Abs. 39,* 4498.)

PATENTS

PROCESS FOR PRODUCING DRYING PRODUCT. Ivor M. Colbeth. *U. S. 2,388,122.* The process comprises oxidizing an aliphatic ester having a long chain acid radical and containing at least two unconjugated double bonds until its iodine value is reduced appreciably, and dehydroxylating the oxidized product.

FRACTIONATION OF TALL OIL. A. W. Hixson and R. Miller (Chemical Foundation, Inc.). *U. S. 2,388,412.* Fatty acids are continuously extracted from tall oil by treatment with liquefied, normally gaseous, hydrocarbon at elevated temperatures at which the rosin is insoluble.

PAINT COMPOSITIONS. J. C. Lichty and N. V. Seeger. *U. S. 2,388,656.* The coating composition comprises a solution of a drying oil, organic isocyanate, and a condensation derivative of rubber.

ISOMERIZING POLYUNSATURATED FAT ACIDS AND DRYING OILS PREPARED FROM THEM. Cyanamid Co. and A. H. Stevens. *Brit. 558,881.* Higher aliphatic polyolefinic monocarboxylic acids are isomerized to increase their degree of conjugated unsaturation by heating an aqueous solution of their soaps and an excell of alkali under pressure at 200-250°. A drying oil is produced by esterification of the isomerized acids with a polyhydric alcohol containing at least three esterifiable hydroxyl groups. (*Chem. Abs. 39,* 4506.)

Abstracts

Soaps

Edited by LENORE PETCHAFT

NEW TRENDS IN SOAP INDUSTRY—PART II. J. Davidsohn and A. Davidsohn. *Ind. Chem. 21,* 461-4 (1945). Besides the usual solvents for the manufacture of soaps such as simple hydrocarbons, turpentine oils and the simple chlorinated hydrocarbons, there are new synthetics such as hydrogenated naphthalene derivatives, hydrogenated phenols and amines. Refined wool fat and lecithin are being used as superfatting agents for toilet soaps. Other additives include egg yolk, products from seaweeds, casein, the mono- and di-glycerine-esters and glycol-esters. Formic acid may be used to lower the pH of soap, while *p*-octyl-phenoxy-acetic acid renders hard soaps more soluble in water. New synthetic detergents are reviewed and the theory of solubilization is discussed.

SURFACE-ACTIVE CHEMICALS — WARTIME CHEMICAL DEVELOPMENTS IN GERMAN INDUSTRY. *Chem. & Met. Eng. 52,* No. 9, 192 (1945). One of the most important discoveries made was the fact that the addition of cellulose glycollic acid sodium salt to synthetic detergents increases their effectiveness to fully the equivalent of that of soap. The amount required was about 25% of the amount of synthetic detergent. The older emulsifying agents were of the long chain aryl polyglycol ether type. Later there was introduced the Emulphor STH and STX type, made by condensing a long chain aliphatic sulfone chloride (Mersol) with ammonia and then with chloroacetic acid. Later, because of shortages, dodecyl xylene sulfonate was also under the same name. Demulsifying agents were of three types—alkyl aryl polyglycol ethers, derivatives (amides) of hydroxyoleic acid sulfate ester, and the sulfonate of di- (ethyl hexyl) maleate. These were each very specific for certain types of petroleum.

DETERGENTS FROM PRIMARY ALCOHOLS OF HIGH MOLECULAR WEIGHT. A. A. Bag and T. P. Egupov. *Uspekhi Khim 14,* No. 1, 56-65 (1945). Individual primary alcs. of high mol. wt. were prepd. by a process of continuous hydrogenation of compound esters of fatty acids in vertical columns filled with small lumps of catalyst comprising a Cu-Al alloy contg. 34% Cu and 66% Al, under high pressure. From these alcs. synthetic detergents of the types "Hardinol," "Velan," and "Cefirol" were prepd. and their properties were

studied. Methods are not given. (*Chem. Abs. 39,* 4767.)

MODERN SHAMPOOS—PART II. S. J. Jannaway. *Perfumery & Essent. Oil Rec. 36,* 206-210 (1945). The following is a continuation of the survey of various types of shampoos: The oils used for soft soap shampoos are usually those already listed for liquid soap shampoos and the alkali used is caustic potash. Cream and paste shampoos may be simply modified shaving creams, soapless detergents in a creamy base, or a mixture of these two types. Good quality soap powder shampoos are composed chiefly of genuine powdered soap with minor additions of borax or soda ash. "Dry" spirit shampoos, better described as spirit shampoos, are dry in the sense that the hair is not wetted before application and there is no rinsing with water afterwards. Liquid soapless shampoos are of two main types, lathering and non-lathering. Lamepons may be used as a soapless base and in mixed-type shampoos especially for use in hard water. Special and medicated types of shampoos are also listed. Formulations are given for the various classes.

MURUMURU WAX IN SOAP. Anon. *Chemurgic Digest 4,* 313 (1945). Hundreds of tons of murumuru, the Brazilian vegetable wax are now being used by American soap manufacturers in place of other oleaginous products from Far Eastern areas seized by the Japanese. Each murumuru fruit weighs about 12.50 grams and approximately 46 per cent of it consists of oil-bearing seeds. The amount of oil in each seed varies between 38 and 42 percent. Acids are present in murumuru wax in the following proportion: caprylic, 1.03; capric, 1.47; lauric, 39.92; myristic, 34.55; palmitic, 4.26; stearic, 2.01; linoleic, 0.38; oleic 10.13. It has a glycerin content of about 12.9 percent. Other characteristics of murumuru are: density—up to (15°) 0.918; melting point—33° to 36° C.; solidification point — 32.5°; saponification value—240; iodine number—5.42; acid value—3 to 18; refractive index—1.425.

SOLVENT PROPERTIES OF DETERGENT SOLUTIONS. K. Tomlinson. *Mfg. Chemist 15,* 198-200 (1944). Work is summarized which connects the occurrence of the micellar soap, which appears when the soln. exceeds a certain crit. concn., with the change in phys. properties of the soap soln., notably its solvent power for grease and other org. substances; the practical applications of this theory are considered in regard to the use of soap and of the newer cationic detergents. The fact that addn. of electrolytes lowers the concn. at which micelles appear (and, consequently, true solvent action) is emphasized. (*Chem. Abs.*)

INORGANO-ORGANIC GELS IN PINENE. I. GELS OF SOME SODIUM SOAPS IN PINENE AND THEIR COOLING AND HEATING CURVES. Mata Prasad and G. G. Hattiangdi, *Proc. Indian Acad. Sci. 21A,* 1-7 (1945). The heats of gelation of Na oleate and Na stearate in pinene were detd. The ratio of molar heat of gelation to abs. temp. of gelation is const. for a given system. II. GELS OF THE SODIUM AND POTASSIUM SOAPS OF OLEIC, STEARIC, AND PALMITIC ACIDS IN PINENE, AND THE FACTORS WHICH INFLUENCE THEIR TIME OF SETTING. Mata Prasad, G. S. Hattiangdi and C. V. Vishvanath, *Ibid.* 56-65—Setting time, t, decreases with increasing concn. For a given gel the plot of log t against 1/T is a straight line. Values of the heat of activation were calcd. Mol. wt. detns. show that true solns. of the various soaps in pinene exist at the b.p. III. VISCOSITY MEASUREMENTS OF GEL-FORMING SOLUTIONS OF SODIUM OLEATE AND SODIUM STEARATE IN PINENE. *Ibid.* 90-102—At temp. above 110° the results satisfy the Einstein equation. In this temp. range the viscosity detns. do not change with time; this fact indicates that true soln. exists. Results obtained with the falling-ball viscometer during the sol-gel transformation can be expressed by the equation: $n_o = ae^{kt}$. IV. THE KINETICS OF SYNERESIS OF SODIUM OLEATE GELS IN PINENE. Mata Prasad, G. S. Hattiangdi and K. N. Mathur. *Ibid.* 105-113—The velocity of syneresis increases as the temp. is lowered or the concn. is decreased. The rate of exudation of liquid is rapid at the start and slows down continuously with time. (*Chem. Abs. 39,* 3993.)

A NEW METHOD OF DETERMINING DETERGENT POWER OF SOAP SOLUTIONS. George Heron. *Textile Mfg. 71,* 253-5 (1945). The method of Rhodes and Brainard is modified by extending the time of washing from 7.5 min. to 4 hrs. and using the Maxwell-Boltzman distribution law instead of Freundlich's equation for adsorption equil. Graphs and tables for water, Lux, Na oleate, Igepon T, and Na cetyl sulfate are given. The detergent factor for soap, or other substance, is a characteristic property that depends on mol. structure. (*Chem. Abs. 39,* 4767.)

LIQUOR CHLOROXYLENOLIS AND CASTOR-OIL SOAPS. A. Firth. *Pharm. J. 154,* 318 (1945). If the pH of this soln. is adjusted to 6, a stable product is obtained even at near freezing. Castor-oil soap of 30% wt./vol. fatty acids is recommended for antiseptic solns. and liniments. (*Chem. Abs. 39,* 4718.)

LIQUID SOAP SPECIFICATION. *Oil and Colour Trades J. 108,* No. 2440, 100 (1945). The following suggestions are made by Soap Makers' Association: specifications for the properties of liquid toilet soap include fatty acid, free alkali, lathering properties, action on skin, keeping qualities, and freezing point. Tests are given for method of estimating the fatty acid content and the determination of lather.

PATENTS

SYNTHETIC SOAPS. Soc anon. Alliance Europeenne. *Belgian 446,053.* A wetting and foaming agent (sulfonated hydrocarbon condensed with an alc.) is dispersed in a carrier (phthalic anhydride or phthalates, etc.). (*Chem. Abs.*)

DETERGENT. Robert B. Colgate, Emil E. Dreger, and Kenneth L. Russell (Colgate-Palmolive-Peet Co.). *Canadian 426,102.* A detergent, substantially dry and nondusting, is prepd. by spray-drying an aq. mixt. of glycerol, the monoglycerides of the acids of coconut oil, and the Na salts of the sulfates of mixed alcs. derived by hydrogenation of coconut oil, or a Na salt of an alkylated aryl sulfonic acid. (*Chem. Abs.*)

MOLDED WASHING COMPOUNDS. I. G. Farbenind. A.-G. *Belgian 446,970.* These soap substitutes are obtained by molding mixts. of a certain quantity of soap or of synthetic washing agents with water-insol. or difficultly water-sol. condensation products and a large proportion of an inert filler (kaolin, plaster or kieselguhr 28-45%). (*Chem. Abs.*)

SURFACE-ACTIVE AGENTS. Joseph B. Dickey and Anthony Loria (Eastman Kodak Co.). *U. S. 2,369,443.* Sulfato derivatives of hydroxy phosphonic acids

with substituted groups used as surface-active agents produced by reaction with ketones or acid chlorides and sulphonated with chlorosulphonic acid.

METHOD OF PRODUCING A FLOATING SOAP. Charles W. Kelley. *U. S. 2,371,175.* Converting a perfumed hard cake of milled soap containing an acid into a hard cake of buoyant floating milled soap by reducing the soap to a fluid mass by boiling, and adding sodium bicarbonate to react with acid forming minute cells of carbon dioxide.

ODORLESS SOAPS FROM SYNTHETIC FATTY ACIDS. Henkel & Cie. G.m.b.H. *Belg. 447,475.* Small quantities of an aldehyde or of a compd. yielding an aldehyde on dissocn. are added to the soaps. In *Belg. 447,483* small quantities of reducing or oxidizing agents are added to the fatty acids to be sapond. (*Chem. Abs.*)

DETERGENT. A. Welter. *Belg. 447,710.* The detergent is produced by saponification of aliphatic sulfonylchlorides in C_8 to C_{12}. The unsaponifiable is sepd. from the very dil. solns. in which it floats and the soap is then salted out with caustic alkali. The alkali present in the sepd. soap can be partly or sompletely neutralized by milling with acids. The product is finally reduced to flakes, powder, etc. (*Chem. Abs.*)

WETTING, FOAMING, AND DISPERSING AGENTS. Bohem Fettchemie-Gesellschaft, m.b.H. *Ger. 736,400.* As such are used sulfonated high molecular weight aliphatic, polyhydric alcohols. (*Chem. Abs.*)

PREPARATION OF WETTING, SUDSING, AND DETERGENT AGENTS. Nathaniel Beverley Tucker (The Procter & Gamble Co.). *U. S. 2,342,563.* Detergent produced by the condensation of a salt of a higher fatty acid with a low molecular weight halogen substituted alkyl sulfonate in the presence of formyl morpholine.

BRIQUETTE DETERGENT COMPOUND. Harold G. C. Fairweather. *British 570,171.* Detergent briquettes are produced from controlled proportions of sodium silicate, water and either trisodium phosphate or sodium carbonate compounded at a temperature at which the mixture is fluid. Said briquettes are sufficiently hard and strong to withstand ordinary handling, are chemically and physically stable and nondeliquescent, are uniform in composition and have a uniform solubility rate. (*Perfumery & Essent. Oil Rec.,* 1945, 227).

DETERGENT COMPOSITION. Foster Dee Snell (Foster D. Snell, Inc.). *U. S. 2,376,096.* A detergent composition comprises a mixture of a water-soluble fatty acid soap and a soap builder consisting of a sodium borate, sodium oxide and boron trioxide.

SOAP AND METHOD OF PRODUCING. Paul R. Mosher (Hercules Powder Co.). *U. S. 2,376,499.* Manufacture of a powdered soap by spray processing a liquid soap comprises a reaction product of a caustic alkali and a material selected from the group of fats, oils and fatty acids, at high temperatures and pressures.

SOAP MOLDING MACHINE. Charles T. Walter (Industrial Patents Corp.). *U. S. 2,385,322.* A soap molding machine for solidifying and stacking soap to a finishing stick form, by extruding a molten soap directly into a moving molding device is described.

DETERGENT COMPOSITION. Wilmer C. Gangloff (The Drackett Co.). *U. S. 2,386,106.* A liquid detergent for cleaning glass comprises an aqueous solution of 2 methyl-2, 4-pentanediol, and a wetting agent of the alkylated sulphonate type.

SOAP MAKING. The Sharples Corporation. *British 559,076.* Soap nigre is purified by adding to the soap nigre a higher aliphatic soap-forming acid, e.g., coconut oil acid, to reduce substantially in quantity or substantially completely to neutralize the free alkali of the nigre, and then removing insol. impurities from the acid-treated nigre by centrifugation. (*Chem. Abs. 39,* 4506.)

DETERGENT COMPOSITION. Truman E. De Villiers (Cities Service Oil Co.). *U. S. 2,383,114.* A detergent composition adopted for cleaning skin comprises orthodichlorbenzene, ethylene glycol monobutyl ether, glycerine and an ethanolamine oleate soap.

APPARATUS FOR COOLING SOAP AND SIMILAR SOLIDIFIABLE MATERIALS. Daniel Alphonsus Hackett (Lever Bros. & Unilever, Ltd.). *U. S. 2,385,134.* A soap cooling apparatus consisting of a cooling cell for cooling apparatus of the filter press type.