oil. Oils as high as 35% FFA content have been refined, but 35% is generally considered the maximum for refining by conventional methods.

The writer has perfected methods and equipment for the esterification with glycerol of the FFA in very high acid extracted olive oil. The esterification is continued until the oil has an FFA content of about 5%. The oil is next subjected to conventional high temperature, vacuum deodorization, not for the purpose of deodorizing at this point, but to convert mono- and diglycerides to triglycerides. Attempting to alkali refine esterified olive oil containing traces of mono- and diglycerides results in emulsions.

Bleaching extracted olive oil is often extremely difficult. In general, massive dosage of activated clays and activated carbon and very high bleaching temperatures are required. As an example, 10% activated clay plus 1% activated carbon at a temperature of 300° F. (under vacuum) has been necessary to secure a merchantable color. The addition of ½% of a 50% solution of sulfuric acid to the oil-clay mixture has resulted in improved color in some instances. Oils which are objectionably red after bleaching may be agitated at 200° F. with ½% to 1% of alfalfa meal and filtered. Oils so treated acquire a delicate green color characteristic of pressed olive oil.

Winterizing of extracted olive oil is necessary to produce an oil which will remain clear at room temperatures. This process is slow because, when chilled, the oil forms a gel rather than crystals. A paper dressed filter press and low filtration pressure is required for satisfactory processing.

Deodorization presents no special difficulties. Deodorization at 400° F. at 5 mm. to 10 mm. pressure for 4 or 5 hours yields a bland, odorless oil. To digress for a moment, the writer at one time was required to process an olive oil which had been accidentally contaminated with cottonseed oil. The oil showed a very positive Halphen test, a strong pink, indicating 1% or more contamination. After preliminary laboratory experiment, a 20,000-lb. batch of the oil was placed in the deodorizer together with 1 lb. of sulfur, 1 gallon of amyl alcohol, and 1 gallon of carbon disulfide. After 5 hours' deodorization the oil was bland and odorless and showed an absolutely negative Halphen test! Deodorization without the Halphen reagents did not destroy the Halphen reaction.

Refined extracted olive oil conforms closely with the chemical and physical characteristics of pressed olive oil but, of course, does not have the characteristic olive flavor for which olive oil is so highly valued. Consequently, refined olive oil is almost never marketed as such, but is blended with pressed olive oils with strong olive flavors and the blend marketed as "Pure Olive Oil."

Summary

Extracted olive oil is not used exclusively for soapmaking but in fact is used to the utmost extent in edible oils. General processing procedures are outlined for the production of edible olive oil from high acid extracted olive oil.

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

THEORIES OF AUTOXIDATION. ANTIOXYGENS. C. Paquot (Lab. Corps Gras). *Inds. corps gras 3,* 111-17, 140-3 (1947).

THE USE AND ROLE OF FATS IN THE TANNERY. C. Gastellu (École Francaise de Tannerie). *Inds. corps gras 3,* 102-10, 132-9 (1947).

CONTINUOUS BUTTER PRODUCTION—A COMPARISON OF METHODS. F. H. McDowall (Massey Agr. Coll., Palmerston North, New Zealand). *Food Inds. 19,* 909-12, 1034, 1036, 1038, 1040 (1947). Six well-defined systems of continuous processing are described. These new methods apparently possess many advantages, but they also pose a number of problems in operation and distribution.

SOLVENT EXTRACTION OF COTTONSEED AND PEANUT OILS. E. L. D'Aquin, J. J. Spadaro, H. L. E. Vix, J. Pominski, L. J. Molaison, and E. F. Pollard (Southern Regional Research Lab., New Orleans, La.). *Oil Mill Gaz. 51,* No. 10, 17-19 (1947). The experiments were undertaken to obtain information required for the design and operation of pilot plant equipment and for the development of processes in solvent extraction. Crude cottonseed oils were produced on a pilot plant scale from a single lot of prime cottonseed by hexane extraction of the cooked and the uncooked meats and by standard hydraulic pressing of the cooked meats. Refining and bleached color tests showed that the crude oil obtained by solvent extraction of either the cooked or uncooked meats with removal of solvent at a temperature below 140° F., compared favorably in quality and grade to the oil prepared by hydraulic pressing. The lightest-bleached oil colors were obtained from the oil produced by solvent extraction of the uncooked meats. The solvent-extracted oils appeared to refine better and still give comparable color and refining tests. The oils produced from the 3 different processings were subjected for 1 hour to heating temperatures from 150-240° F. In all cases the bleached oils were darker in color as the heating temperature was raised. The oil extracted from the uncooked meats, although of lighter original bleached color, appeared to degrade in color more rapidly at the 150° and 240° F. temperature levels than did the oil extracted from the cooked meats; and its final bleached color was darker after heating at 240° F. The hydraulic-pressed oil was markedly less affected by heating than either of the 2-hexane-extracted oils and did not exhibit a sharp bleached color degradation as did the hexane-extracted oils. It is not known to what extent the darker bleached oil colors which resulted from heating the crude oil can be attributed to actual darkening of the oil *in situ* during heating or to fixation of the original pigments. (*Chem. Abs.*)

SOUTH AFRICAN FISH PRODUCTS. XXVI. APPLICATION OF THE FITELSON METHOD OF "SQUALENE" DETERMINATION TO SOME MARINE OILS. M. L. Karnovsky and W. S. Rapson (Univ. Cape Town, South Africa). *J. Soc. Chem. Ind. 66,* 124-5 (1947). The technic described by Fitelson for the determination of olive oil in edible oil mixtures has been applied to several marine oils with unsaponifiable fractions of different types. The results indicate that the method should be of particular value in the structural analysis and characterization of fats of marine origin.

THE PIGMENTS OF COTTONSEED. III. GOSSYFULVIN, A NATIVE COTTONSEED PIGMENT RELATED TO GOSSYPOL. C. H. Boatner, R. T. O'Connor, M. C. Curet, and C. S. Samuels (Southern Regional Research Lab., New Orleans). *J. Am. Chem. Soc. 69,* 1268-73 (1947). The molecular formula, $C_{34}H_{34}N_2O_8$, has been proposed for gossyfulvin. The exact correspondence of the absorption spectra of gossyfulvin and dianilinogossypol, and their dissimilarity with that of gossypol, have been assumed as evidence that gossyfulvin and dianilinogossypol possess identical basic structures and that both are different from the preponderant tautomeric form of gossypol. The isomerism of the 3 oximes formed from gossypol, dianilinogossypol, and gossyfulvin has been presented as evidence for the lability of the carbonyl groups of gossypol.

A NOTE ON THE ELECTRON MICROSCOPE EXAMINATION OF GREASES. S. G. Ellis (Univ. Toronto). *Can. J. Res. 25A,* 119-23 (1947). A method is described for examining the soap component of lubricating greases with the electron microscope. The soap component is mounted on Formvar films from a dispersion in ether. The specimen is shadow cast by the method of Williams and Wyckoff. The deduction of the shape of the soap particles is discussed.

THE POLYMORPHISM OF TRIOLEIN. R. H. Ferguson and E. S. Lutton (Procter & Gamble Co., Ivorydale, Ohio). *J. Am. Chem. Soc. 69,* 1445-8 (1947). Observation by Wheeler, *et al.,* of 3 polymorphic forms melting at —32, —13, and 5.5° has been confirmed. On the basis of these melting points and newly reported evidence from time-temperature curves, and particularly from X-ray diffraction patterns, these forms may be regarded as α, β', and β. It is a matter of fundamental interest that α, β', and β structure types, of double chain length, not only persist through the saturated series, tristearin, tripalmitin, etc., but appear also for the triunsaturated glyceride triolein.

X-RAY DIFFRACTION ANALYSES OF SYNTHETIC UNSATURATED MONACID DIGLYCERIDES. B. F. Daubert (Univ. Pittsburgh) and E. S. Lutton. *J. Am. Chem. Soc. 69,* 1449-51 (1947). The preparation of the monacid diglycerides, 1,3-diolein, 1,3-dilinolein, and 1,3-dilinolenin in a high degree of purity is reported. There appears to be but a single polymorphic form for each of these 1,3-unsaturated diglycerides. X-ray diffraction data for the 3 compounds are highly distinctive as indicated by long spacings—diolein, 39.3; dilinolein, 45.2; and dilinolenin, 40.3.

X-RAY INVESTIGATION OF GLYCERIDES. VI. DIFFRACTION ANALYSES OF SYNTHETIC TRIACID TRIGLYCERIDES. S. S. Sidhu and B. F. Daubert (Univ. Pittsburgh). *J. Am. Chem. Soc. 69,* 1451-3 (1947). Long and short spacing X-ray data are reported for 3 homologous triacid triglycerides, 2 of which are new compounds, namely, 1-palmityl-2-myristyl-3-laurin and 1-myristyl-2-lauryl-3-caprin.

AN X-RAY AND THERMAL EXAMINATION OF THE GLYCERIDES. VIII. GLYCERIDES OF ERUCIC, BRASSIDIC, OLEIC, AND ELAIDIC ACIDS. M. G. R. Carter and T. Malkin. *J. Chem. Soc. 1947,* 554-8. The α-monoglycerides and α,α'-diglycerides of erucic, brassidic, oleic, and elaidic acids and the triglycerides of erucic, brassidic, and elaidic acids are found to exhibit the same type of polymorphism as the corresponding saturated compounds. The X-ray examination reveals an interesting difference in structure between the *cis-* and the *trans*-compounds, which appears to be general for long-chain compounds. Some observations are made on the misleading X-ray data for α-monoglycerides reported by Filer, Sidhu, Daubert, and Longenecker.

NOR-CONIDENDRIN. A NEW ANTIOXIDANT FOR FATS AND OILS. G. S. Fisher, L. Kyame, and W. G. Bickford (So. Reg. Res. Lab., New Orleans, La.). *Soap Sanit. Chemicals 23,* No. 6, 49 (1947). A new polyphenolic antioxidant, nor-conidendrin, has been prepared in good yields by the hydrolysis of conidendrin, the parent substance obtained by extraction with a chlorinated solvent of sulfite waste liquors from the manufacture of pulp from the western hemlock. The new substance is similar to 2 other antioxidants which have been approved for certain food uses, namely, gum guaiac and nordihydroguaiaretic acid (NDGA), also polyphenols derived from resinous trees or shrubs.

A SYNTHESIS OF NORDIHYDROGUAIARETIC ACID. S. V. Lieberman, G. P. Mueller, and E. T. Stiller (Wyeth Inst. Applied Biochem., Philadelphia, Pa.). *J. Am. Chem. Soc. 69,* 1540-1 (1947).

CONTROL OF RANCIDITY IN FISH FLESH. I. CHEMICAL ANTIOXIDANTS. H. L. A. Tarr (Pacific Fisheries Expt. Sta., Vancouver, B. C.). *J. Fish. Res. Bd. Can. 7,* 137-54 (1947). The development of rancidity in the naturally occurring fats of frozen fish was retarded by treatment with ascorbic acid (0.05%), Et, n-Pr, n-Bu or hexyl gallates (0.01 to 0.05%), and cysteine hydrochloride (0.05%). Ethanol ammonium gallate (0.02%), dodecyl thiodipropionate (0.05%), thiourea (0.05%), citric and tartaric acids (0.02%) were ineffective. The loss of surface red color which occurred during storage of coho and red spring salmon was largely prevented by pre-treatment with 0.02% of Et or Pr gallate. Both NaCl and $NaNO_2$ acted as pro-oxidants in frozen fish. In unfrozen salmon stored at 0° both Et gallate and $NaNO_2$, retarded fat oxidation and bacterial increase.

THE ABSORPTION OF FAT FROM THE INTESTINE. A. C. Frazer. *Chemistry & Industry 1947,* 379-82. The intestinal absorption of fat is a cytological problem. The essential constituents of the intestinal emulsifying system are fatty acids, bile salt, and monoglyceride. Fatty acids and monoglycerides are formed in adequate quantities during the first 5 hours of pancreatic lipolysis. The hydrolysis of long chain triglycerides may be restricted in the upper two-thirds of the intestine. More extensive hydrolysis may occur in the lower part of the ileum. Short chain triglycerides, such as tributyrin, are more freely hydrolyzed. The possibility of particulate absorption is discussed. It is suggested that the effect of adrenalectomy on fat absorption is due to changes in electrolyte metabolism affecting particulate absorption. The function of phosphorylation in the intestinal cell is discussed. Choline alters the distribution of fat between the intestinal cell and the corium of the villus. Other vitamin fractions did not appear to have any action on the fat absorption mechanism. Absorbed fatty material may be distributed either by the lacteal-lymphatic pathway to the fat depot via the systemic blood, or direct to the liver by the portal vein. Triglycerides are likely to pass by the former route and fatty acids by the latter. The factors which affect distribution are described. A working hypothesis of the fat absorption mechanism is presented.

LIPEMIA AND FAT DEPOSITION IN RESPONSE TO ORAL ADMINISTRATION OF SYNTHETIC ESTROGENS. F. W. Lorenz (Univ. California, Davis) and G. H. Bachman. *Poultry Sci. 26, 419-31 (1947).* An investigation has been made of the lipogenous efficiency of synthetic estrogens on Single Comb White Leghorn cockerels as affected by variations in age of bird from 8-12 weeks at autopsy, by duration of treatment from 2-6 weeks, and by dosage of estrogen when fed at levels of 0.0033-0.01% of the diet. Within these limits the efficiency was increased by increasing the length of treatment and by decreasing the feed level of the estrogen. Older birds used the estrogen more efficiently than did younger birds. Weight for weight, when administered orally, dienestrol diacetate and dianisylhexene are equally potent lipogenous agents, even though the latter is a more potent oral estrogen by other criteria. Fat deposition may be stimulated by estrogens without developing a lipemia. With dienestrol diacetate the threshold for the former is appreciably below that for the latter, but additional stimulation to fat deposition occurs at the threshold for lipemia development. An increase was observed in the threshold to dianisylhexene (but not to dienestrol diacetate) with increasing age at start of treatment, both for lipemia and for fat deposition.

PATENTS

DISINTEGRATION OF FAT CONTAINING MATERIAL. W. Ekhard. *Ger. 707,226 Cl. 23a.* This is an enzyme rendering process, according to which the comminuted stock is mixed with carbohydrate media and cultured with lactic acid producing bacteria. During fermentation the charge is aerated, whereafter the fat and/or oil is separated and washed.

MARGARINE. B. Petersen. *U. S. 2,422,633.* Partial condensation products of fatty acids and polysaccharides are used as emulsifiers for margarine.

EMULSIFYING AND WHIPPING AGENTS FOR ICE CREAM, SALAD DRESSING, MARGARINE, ETC. N. F. Johnston (R. T. Vanderbilt Co., Inc.). *U. S. 2,422,486.* The composition consists essentially of about 24 parts of a condensation product of sorbitan mono stearate and ethylene oxide in molar ratio of about 1:4 and about 6 parts of a condensation product of sorbitan mono stearate and ethylene oxide in molar ratio of about 1:20 emulsified in water.

CHROMAN COMPOUNDS. L. I. Smith and M. E. Ungnade (Univ. Minnesota). *U. S. 2,421,811.* The products of the invention are active antioxidants, and are structurally similar to tocopherols. The preparation comprises reacting a γ, γ-dialkyl substituted allylic alcohol having a double bond in the β, γ-position to the —OH group with aromatic compounds containing an *o*-position free —OH group.

TALL OIL DRYING OILS. F. C. Martin. *U. S. 2,421,842.* Method of producing a drying oil from tall oil comprises esterifying the oil with pentaerythritol in an inert atmosphere in the presence of at least one alkaline catalyst and at least one siliceous catalyst.

BREAKING PETROLEUM EMULSIONS. C. M. Blair (Petrolite Corp. Ltd.). *U. S. 2,422,822.* Certain fat acid derivatives are used as demulsifiers in the process.

LUBRICANT IMPROVER. J. M. Musselman and H. P. Lankelma (The Standard Oil Co.). *U. S. 2,422,630.* The improver is prepared by heating an organic thiophosphate reaction product, P_2S_5, and a natural ester wax to 275° F. to form a sludge containing P, the sludge is removed, and the remainder is converted to Ca compounds.

LUBRICATING OILS. C. M. Blair (Petrolite Corp. Ltd.). *U. S. 2,422,881.* The condensation and polymerized products of fatty alcohols and polybasic acids are added to mineral oil lubricants to improve viscosity and lower the pour point.

RECLAIMING SYNTHETIC RUBBERS WITH A FATTY ACID AND LIVE STEAM. R. V. le Beau (Midwest Rubber Reclaiming Co.). *U. S. 2,423,033.* A step in the manufacture of reclaimed previously vulcanized rubbery synthetic polymers comprises heating such materials by contact with live steam in the presence of 3-35% of a saturated fatty acid which does not contain hydroxyl groups in the chain other than in the carboxyl groups, and a solvent for the acid which swells the rubber.

SULFURATED CUTTING AND GEAR OIL. B. I. Buxbaum (H. Farwick). *Ger. 709,289 Cl. 23c.* The S containing ingredient for the oils is made in the form of paste, by grinding flowers of S dispersed in fatty oil at normal temperature and to a fineness of 1-2 μ.

Drying Oils

Edited by **HOWARD M. TEETER**

CHEMICAL REACTIONS IN THE VARNISH KETTLE. P. O. Powers (Battelle Memorial Inst., Columbus). *Official Digest Federation Paint and Varnish Production Clubs 270,* 429-37 (1947). A discussion of composition of oils, polymerization of oils, dispersion of resins, etc.

SCIENTIFIC RESEARCHES OF I. G. FARBENINDUSTRIE IN THE FIELD OF SYNTHETIC RESIN ACIDS AND DRYING OILS. W. Reppe (I. G. F., Ludwigshaven). *Reichsamt Wirtschaftsausbau Pruf.-Nr. 36* (PB 52002), 35-46 (1940). A review of studies made by I. G. F. during the 15 years prior to 1940. (*Chem. Abs. 41,* 4655).

THE EVALUATION OF NEW VARNISH OR PAINT OILS. H. B. Preble, G. P. Woodward, and E. C. Haines (Philadelphia Production Club). *Official Digest Federation Paint and Varnish Production Clubs 269,* 364-70 (1947). Report of examination of 3 commercial oils by 10 cooperating laboratories. The results indicated that the methods employed were unsatisfactory. The results of the heat-bodying test were in good agreement.

THE DRYING POWER OF LINOLEATES IN RELATION TO THEIR METAL CONTENT. C. Mazzanti and S. Pagini. *Pitture e vernici 2,* 357 (1946). The catalytic power of metal linoleates on the oxidation of linseed oil depends on the temperature, on the method of preparation, and particularly on the metal content. One part of Co linoleate containing 8% Co is more active than 2 parts of another containing 4% Co; but the absorption of Co by the linseed oil is easy up to 4% and very difficult over this percentage. (*Chem. Abs. 41,* 4319.)

PETROLEUM HYDROCARBONS WITH DRYING PROPERTIES. *C. Zerbe. Reichsamt Wirtschaftsausbau* Pruf.-Nr. *36* (PB 52002), 47-57 (1940). The unsaturated resins in crude petroleum are discussed at some length and new data are given. (*Chem. Abs. 41,* 4637.)

TECHNOLOGICAL APPLICATIONS OF THE RESULTS OF RESEARCH IN SYNTHETIC RESINS AND DRYING OILS. O. Jordan. *Reichsamt Wirtschaftsausbau* Pruf.-Nr. *36* (PB 52002), 59-67 (1940). A descriptive article indicating in what industries and under what conditions substitutes could and should be used to replace natural resins and drying oils. (*Chem. Abs. 41,* 4655.)

PATENTS

VARNISH AND METHOD OF MAKING THE SAME. L. Auer (Ridbo Laboratories). *U. S. 2,422,175.* A varnish base is prepared by cooking at varnish cooking temperatures at and above 240°, (1) a varnish base mixture comprising a varnish resin and a varnish oil selected from the class which consists of Chinawood oil, oiticica oil, dehydrated castor oil, and esters of the formula "ab" in which "a" represents a long chain unsaturated fatty acid having multiple double bonds and "b" represents the radical of an alcohol having at least four OH groups, and (2) a mixture of rosin and resin: hydrocarbons constituting 5-20% of the amount of varnish oil present.

DRYING OIL-POLYVINYLACETAL COMPOSITIONS. B. C. Pratt (E. I. du Pont de Nemours & Co.). *U. S. 2,422,259.* Alkali refined linseed oil and low-viscosity, low-hydroxyl (10-13%) polyvinyl butyral in amounts of from 25-75% of mixture, are heated together at 275-280° until the mixture is compatible at ordinary temperatures.

RESINOUS INTERESTERIFICATION PRODUCT MADE WITH HYDROXYLATED FATTY OIL. E. A. Lasher (California Flaxseed Products Co.). *U. S. 2,422,356.* A resin is prepared by interesterification and interpolymerization of (1) an acid ester of an hydroxylated fatty glyceride oil with citric, malic, or citric with lactic acids, and (2) a diethylene glycol ester of phthalic or adipic acid; the proportions of the acid ester to the diethylene glycol ester being in the range from 1:2 to 2:1 parts by weight.

PROCESS OF MAKING A WATER DISPERSIBLE COATING VEHICLE. G. E. Eilerman (Pittsburgh Plate Glass Co.). *U. S. 2,423,230.* A resin composition capable of forming a non-skinning emulsion in water is prepared by a process which comprises neutralizing with sodium silicate and ammonia the adduct of maleic anhydride and a glyceride drying oil, the anhydride rings of the adduct being opened before neutralization.

FRACTIONATION OF TALL OIL. S. E. Freeman and S. W. Gloyer (Pittsburgh Plate Glass Co.). *U. S. 2,423,232.* Rosin acids are separated from tall oil by a process which comprises preferentially esterifying the fatty acids with an open chain alcohol containing 1-5 C atoms, then contacting the ester mixture simultaneously with naphtha and a polar solvent immiscible with naphtha to obtain 2 liquid phases, one comprising naphtha containing in solution a concentrate of the fatty acid esters and a minor portion of rosin acids, the other phase comprising polar solvent containing in solution a concentrate of rosin acids containing a minor amount of fatty acid esters, separating the solutions and recovering the solvents.

METHOD OF SEPARATING POLYMERS OF HEAT POLYMERIZED DRYING OIL. I. M. Bernstein. (H. D. Roosen Co.). *U. S. 2,423,751.* Polymeric fractions of heat polymerized drying oil are separated by successively extracting the polymerized oil with progressively higher homologues of a saturated aliphatic primary alcohol, the alcohol and homologues having 3-6 C atoms, and separating the respective extractions.

TREATMENT OF TALL OIL. H. O. V. Bergstrom, K. G. Trobeck, and G. B. Heijmer. *Swed. 117,543.* The oil obtained by the distillation of liquid rosin is heated to above 250° until the acid number is about 7, preferably in the presence of less than 1% of a metal, such as Mg. Water formed during the reaction is removed. (*Chem. Abs. 41,* 4648.)

APPARATUS FOR CONTINUOUS POLYMERIZATION OF DRYING OILS. V. I. Tsyganov, V. I. Chudaev, and I. L. Borisov. *U. S. S. R. 66,822* (1946). The apparatus comprises a water-jacketed chamber, in the upper part of which is a rotating disk provided with a heating element and with channels serving to atomize the oil. (*Chem. Abs. 41,* 4657.)

Soaps

Edited by
LENORE PETCHAFT

SYNTHESIS OF TAURINE AND N-METHYLTAURINE. J. W. Schick and E. F. Degering. *Ind. Eng. Chem. 39,* 906-9 (1947). Taurine and related compounds are potentially useful as cheap intermediates for wetting agents and detergents. They may be made as follows: Ethylene chloride is sulfonated with Na_2SO_3 and then aminated with anhydrous NH_3 and aqueous NH_3 (27%) and $(NH_4)_2CO_3$. A colorimetric method for the determination of minute amounts of taurine consisted of developing a blue color from the reaction of taurine with a solution of phenol and $Ca(ClO_2)_2$. N-methyltaurine was synthesized by the amination of sodium 2-chloroethane-1-sulfonate with anhydrous Meamine and aqueous methylamine (30-40%).

METAL-CLEANING METHODS. B. B. Button, Jr. *Southern Power & Ind. 65,* No. 6, 55-7 (1947). A satisfactory metal cleaner for eliminating oil film and dirt must have good wetting action, usually secured by the use of synthetic wetting agents; emulsification is also necessary to prevent the redeposition of the oil, and this property should carry over into the rinse. Fatty acids should be saponified and deflocculating action is important in removing solid dirt. Buffers may be required to keep the pH at the proper value and water-softening chemicals are frequently used with cleaners. For acid cleaners, inhibitors are frequently necessary. Temperature and agitation are important factors in metal cleaning. (*Chem. Abs. 41,* 4664.)

STRUCTURE FOR SOAP MICELLES AS INDICATED BY A PREVIOUSLY UNRECOGNIZED X-RAY DIFFRACTION BAND. R. W. Mattoon, R. S. Stearns, and W. D. Harkins (Univ. Chicago). *J. Chem. Phys. 15,* 209-10 (1947). Measurements on a previously unrecognized X-ray diffraction band B_m show that in aqueous solution the micelle of a soap, or similar colloidal electrolyte, consists of only one double layer of soap molecules. The Bragg spacing and 2 times the length of the molecule are compared for K caprylate, K caprate, K laurate, K myristate, K palmitate, and Na lauryl sulfate. As the concentration increases, the micelles become closer together and a short-range order between them gives rise to the B_i band. When a hydrocarbon is solubilized in a soap solution the thickness $d_{M'}$ of the micelle is increased by $d_{M''}$. In K laurate solutions saturated with PhEt, $d_{M'} = 6$ A.; in K myristate saturated with n-C_7H_{16} and with C_6H_6, $d_{M'}$ is 11 A. and 13 A., respectively. (*Chem. Abs. 41*, 3366.)

FLOW PROPERTIES OF SOME ANHYDROUS SODIUM SOAPS. F. W. Southam and I. E. Puddington (National Research Lab., Ottawa, Can.). *Can. J. Research 25B*, 125-31 (1947). The flow properties of anhydrous Na stearate were determined over the range of 45-140°, by use of an extrusion plastometer. Flow of some of the Na soaps of the lower fatty acids was determined at a single temperature. Large changes in the properties of Na stearate were found at 68 and 105°. An abrupt change was also found when the number of C atoms in the soap was reduced below 8. Flow-pressure curves are plotted for both pure and technical Na stearate at various temperatures. Also, changes in mobility and yield with temperature are plotted. The changes are attributed to loosening of the crystal bonds in one dimension and the consequent provision of easier slip planes. The results and plot of the yield value with change in the number of C atoms of Na soaps indicate the increasing strength of the nonpolar crystal bonds as the hydrocarbon chain is shortened. (*Chem. Abs. 41*, 4357.)

INFLUENCE OF THE PHYSICAL PROPERTIES OF SODIUM SOAPS ON THEIR DISPERSIONS IN MINERAL OIL. F. W. Southam and I. E. Puddington (National Research Lab., Ottawa, Can.). *Can. J. Research 25B*, 121-4 (1947). The conventional method of preparing stable lyophilic dispersions of Na soaps in mineral oils is to heat the soap with a limited amount of oil to a temperature of about 160°, the rest of the oil is added slowly with agitation and the temperature is reduced gradually to 120°. If the temperature is reduced below 120° previous to application of high shear, an unstable dispersion results in which the soap appears to be completely lyophobic. It is interesting that this sudden change from the lyophobic to the lyophilic system takes place at about the same temperature as a large density change in the soap. To confirm the association of the 2 changes, densities of anhydrous Na salts of saturated acids from caproic to stearic were measured from 30-300° and the results correlated with the properties of lyophilic dispersions of Na soaps in mineral oil. Increments of density are plotted against temperature. The usual large changes in density are shown at 100, 120, and 190° with the fatty acids of higher molecular weight, the latter density break occurring at higher temperatures as the chain length of the fatty acid is reduced. The bidimensional m.p., which is shown by all the soaps down to and including Na caprylate, is entirely absent in the caproate. Since the latter soap does not form stable dispersions in mineral oil it is suggested that at the bidimensional m.p. the soap crystal has absorbed enough thermal energy for the hydrocarbon chains to separate sufficiently for oil to penetrate the crystal lattice, and, at the same time, the soap becomes plastic. (*Chem. Abs. 41*, 4639.)

MERSOLATE DETERGENTS—THEIR PRODUCTION AND BLENDING WITH SOAPS. H. Groninger (Zeist, Holland) *Soap Sanit. Chemicals 23*, No. 7, 40-2, 83, 85 (1947). The preparation of Mersol is reviewed. It is a mixed sulfochloride consisting mostly of the monosulfochloride with small amounts of the disulfochloride. Mersolates are produced by neutralizing Mersol with various alkalies such as caustic soda and potash. This reaction is a very exacting one and detailed directions for the neutralization are given. Mersolates may be used in toilet, settled, household soaps and washing powder. Because of its hygroscopy, certain procedures must be followed in the preparation of each of the above types, and these are outlined. The instructions issued in the government regulations regarding Mersol conversion and mersolate supply are included.

SOLUBILIZATION IN TEXTILE PROCESSING. J. W. Creely. *Am. Dyestuff Reptr. 36*, 411-12, 424 (1947). The phenomenon of solubilization and the role of soap and detergents in the process is reviewed. The applications of this solubilization in textile fields such as wool scouring, determining the efficiency of grease recovery, and in dry cleaning soaps are described.

PATENTS

ALCOHOLS AND ESTERS. (Procter and Gamble Co.) *Brit. 584,939.* Metallic salts of carboxylic acids are reduced to the corresponding alcohols and (or) esters in a continuous process. Thus, the Pb soaps of coconut oil mixed fatty acids (prepared from the acids and litharge at 120-140°) are hydrogenated at 340-450° under about 4000 lb./sq. in. operating pressure to a mixture of principally dodecyl and tetradecyl alcohols. In similar fashion, cupric soaps of coconut oil fatty acids and Pb benzoate are reduced to the corresponding alcohols while Cd stearate gives octadecyl stearate. The apparatus employed is described. (*Chem. Abs. 41*, 3812.)

PREVENTION OF DUST AND LUMPING IN SOAP. S. J. Holuba (Colgate-Palmolive-Peet Co.). *U. S. 2,423,451.* Soap particles are sprayed at a high temperature with a water-soluble solution of Na silicate, tumbled, cooled, and dried to coat the particles with silicate, thus preventing dust and lumping of the soap.

PREPARATION OF SPRAY DRIED SOAP PARTICLES HAVING ONLY SLIGHT DUST-FORMING TENDENCIES. R. F. Heald and M. L. Givan (Colgate-Palmolive-Peet Co.). *U. S. 2,423,449.* Treating spray dried soap particles with about 0.5-3% of a heavy mineral oil fraction to prevent dust formation and lumping or balling.

PROCESS FOR INCREASING SPECIFIC GRAVITY OF SPRAYED DRIED ORGANIC DETERGENTS. S. J. Holuba (Colgate-Palmolive-Peet Co.). *U. S. 2,423,452.* Spray dried synthetic detergents can be compacted and increased in density, thus inhibiting dust formation by subjecting to the action of steam or combination of steam and water while tumbling or agitating the material.

PREPARATION OF SYNTHETIC ORGANIC DETERGENT PARTICLES HAVING ONLY SLIGHT DUST-FORMING TENDENCIES. R. F. Heald and M. L. Givan (Colgate-Palmolive-Peet Co.). *U. S. 2,423,450.* Spraying of detergent particles with a small amount of a mineral oil to prevent dust.