☆ ☆ ☆ ABSTRACTS ☆ ☆ ☆

Oils and Fats

Edited by
M. M. PISKUR and MARIANNE KEATING

COMPARATIVE STUDIES CONCERNING METHODS FOR THE DETERMINATION OF FAT IN GROUND MATERIAL (WHEAT GERMS). I. Antener and O. Hogl (Eidg. Gesundheitsamt, Bern, Switz.). *Mitts. Gebiete Lebensm. Hyg. 38,* 207-25 (1947). The results differed as much as 2.41% for material with a total fat content of 10-12%; this amounts to a variation of about 20%. The results of the Soxhlet method depend on the solvent, especially its b.p. The lowest values were obtained by the cold extraction method of Achermann which probably yields only the free fat. The highest values were obtained by the alcohol-ether method of Terrier. Decomposition with HCl was the most destructive method and is used only when other methods fail. STUDIES ABOUT PHOSPHATIDES IN WHEAT GERMS. *Ibid.* 226-44. The fat extraction of wheat germs by Terrier's method yields a mixture of phosphatides with 4-5% sugar. The complex phosphatide-sugar was studied qualitatively and quantitatively and its mode of union was examined. The possibility of an adsorptive combination between the phosphatide and sugar is discussed. (*Chem. Abs. 42,* 291-2.)

FATTY ACID PROCESSING. Robert F. Brown (Emery Industries, Inc.). *Soap, Sanit. Chemicals 24,* No. 2, 55-6, 163 (1948). The composition, manufacture, and utility are discussed in the light of trends in modification and separation.

THE KETONIZATION OF HIGHER FATTY ACIDS WITH SOME OBSERVATIONS ON THE MECHANISM OF THE REACTION. PART I. STUDIES OF WAXES. R. G. Curtis, A. G. Dobson, and H. H. Hatt (Council for Scientific and Industrial Res., Melbourne, Australia). *J. Soc. Chem. Ind. 66,* 402-7 (1947). A number of metallic oxides and carbonates may be used as catalysts for the preparation of dialkyl ketones from higher fatty acids in the liquid phase. All cause violent frothing which can be controlled by adding the fatty acid gradually to the catalyst at the reaction temperature. MgO is selected as most suited for the commercial preparation of ketones. The most suitable reaction temperature range is 330-360°. The crude ketone is greasy, but its properties are greatly improved by pressing. During the reaction CO$_2$ is evolved in an amount equal to 94% of that required for complete ketonization.

TRIPLE CHAIN-LENGTH STRUCTURES OF SATURATED TRIGLYCERIDES. E. S. Lutton. *J. Am. Chem. Soc. 70,* No. 1, 248-54 (1948). Polymorphic forms of many mixed saturated triglycerides show long spacing values which are abnormally large, that is, they are too large to permit their associated crystal structures to be classified as typical double-chain-length structures. Most of these abnormal values can be interpreted as due to triple-chain-length structures analogous to that of the mixed unsaturated C$_{18}$ triglyceride, 2-oleyldistearin. This triple structure presumably arises from a sorting of chains—sorting of short from long chains in the case of mixed saturated triglycerides, in manner similar to the sorting of unsaturated from saturated chains for 2-oleyldistearin. These considerations lead to the proposal of a new type of molecular configuration in triglyceride crystals, a "chair" type of arrangement for certain unsymmetrical compounds in contrast to the generally accepted "tuning fork" arrangement. Long spacings corresponding to quadruple-chain-length structure have also been noted.

ON THE FORTIFICATION OF EDIBLE FAT WITH VITAMIN A. U. P. Basu and S. K. Sen Gupta (Bengal Immunity Res. Lab., Calcutta, India). *J. Am. Chem. Soc. 70,* No. 1, 413 (1948). For making up the deficiency of vitamin A edible fat is fortified with some vitamin preparation; but on storage the preparation often loses its vitamin A potency, mainly due to oxidation. The preliminary investigations indicate that vitamin A acetate may preferentially be used in fortifying an edible fat.

STUDIES OF FAT METABOLISM IN HUMAN SUBJECTS. J. R. Chipault and W. O. Lundberg. *1946-47 Ann. Report Hormel Inst.* 35-8. During the fat-free diet the dry weight, lipids, fatty acids, and unsaponifiable matter of the feces greatly decreased. The lipids decreased rapidly at first and then more slowly to an approximately constant level. When triolein was fed, the dry weight, total lipids, and fatty acids rose, the latter two to levels above normal. The unsaponifiables remained constant. During the early stages of the triolein diet, the fatty acids obtained from the feces were liquid at room temperature. Toward the end of the triolein period, however, the fecal fatty acids were solid at room temperature, even though their total quantity remained somewhat above the level found on a normal diet. Throughout most of the periods on the fat-free diet and on the triolein diet, the subject exhibited a slightly negative nitrogen balance. He lost no significant amount of weight at any time.

MARGARINE AND THE GROWTH OF CHILDREN. H. Leichenger, G. Eisenberg, and A. J. Carlson (Chicago). *J. Am. Med. Assoc. 136,* 388-91 (1948). Whether the greater part of the fat of the diet is derived from vegetable or animal sources has no effect on growth and health as shown by changes in height and weight and health records of children observed over a 2-year period. During a 2-year period the health of 267 children was uniformly good so far as serious illness is concerned, regardless of whether margarine or butter was the source of the greater part of the fat in the diet. If there is a growth factor present in butter which is not present in margarine, there is no evidence in the present study that such a factor plays an important part in the growth of children as determined by increases in height and weight. Margarine is a good source of table fat in growing children, as determined by a 2-year study. Children readily accept margarine as a table spread when it is colored and served in pats.

COMPARATIVE PHYSIOLOGICAL STUDY OF MOBILIZATION OF FAT FROM TWO TYPES OF ADIPOSE TISSUE DURING FASTING. G. Clement (Univ. Paris). *Compt. rend. soc. biol. 141,* 255 (1947). In fasting rats the white body fat is used up much faster than the brown interscapular fat. DIRECT DEMONSTRATION OF THE MOBILIZING ACTION OF HYPOPHYSIAL HORMONES ON FAT RESERVES; ROLE OF THE SYMPATHETIC NERVOUS SYSTEM. *Ibid.* 317-20. In fasting rats the injection of extract of either anterior or posterior hypothysis causes an increase in liver fat and an accelerated mobilization of depot fats. White perirenal fat is mobilized faster than brown interscapular fat. Section of the sympathetic nerves leading to the fat deposit areas seems to inhibit the effect of the hypophysial hormones. DEMONSTRATION OF THE MOBILIZING ACTION OF ADRENALINE ON RESERVE FATS; ROLE OF THE SYMPATHETIC NERVOUS SYSTEM. G. Clement and G. Schaeffer. *Ibid.* 320-2. Slow injection of large doses of adrenaline produces effects similar to those of hypophysis extracts. Since its action is diminished or abolished by section of the sympathetic nerves of the fat deposit areas, the action cannot be direct but must be exerted through the nervous system. (*Chem. Abs. 42,* 261-2.)

FAT ABSORPTION IN TROPICAL SPRUE. D. A. K. Black, J. P. Bound, and L. P. R. Fourman. *Quart. J. Med. 16,* 99-109 (1947). Fat-balance experiments were carried out on 28 patients with early tropical sprue. The results were expressed as "percentage fat absorption" (dietary fat minus fecal fat divided by dietary fat). In untreated sprue, fat absorption was 51-85%; normal was over 90%. Nicotinic acid and riboflavin given by injection did not cause clinical improvement or increase fat absorption. Adequate parenteral liver administration was followed by gain in weight and clinical improvement, but improvement in fat absorption was not apparent for some weeks. (*Chem. Abs. 42,* 171.)

SERUM LIPIDES AND THEIR VALUE IN DIAGNOSIS. Siegfried J. Thannhauser (Tufts Coll. Med. School, Boston, Mass.). *New Engl. J. Med. 237,* 515-22, 546-52 (1947). The determination and clinical significance of serum neutral fat, phosphatides, cerebrosides, cholesterol, cholesterol esters, and total fatty acids, are reviewed with 128 references. Values in various diseases and in the normal state are tabulated. (*Chem. Abs. 42,* 271-2.)

PATENTS

CONTINUOUS FAT COOLER. H. L. Murray (Murray Deodorizers, Ltd.). *U. S. 2,433,475.*

CHLORITE BLEACHING OF FATS. C. A. Hampel (The Mathieson Alkali Works, Inc.). *U. S. 2,433,662.* In the bleaching of fatty acid compounds, the improvement comprises admixing the material to be bleached with a water soluble chlorite and a persulfate in the presence of water at a pH not less than about 7.

OLEOMARGARINE. C. E. Nelson (Kraft Foods Co.). *U. S. 2,434,429.* The process comprises a standardized cooling step followed by treatment in a colloid mill.

ANTIOXIDANTS. L. O. Buxton (Nopco Chem. Co.). *U. S. 2,433,593.* Antioxidants are extracted from soap stock using ethylene dichloride as the solvent.

FAT-SOLUBLE VITAMIN CONCENTRATES. L. O. Buxton (Nopco Chem. Co.). *U. S. 2,434,788-90.* If a small quantity of antioxidant is added to marine oils prior to fractionation, a very substantial increase in the yields of vitamin A ester in the concentrate or extract portion and of vitamin content in the residue occurs.

POLYUNSATURATED FATTY ACIDS REMOVAL FROM OLEIC ACID. J. Ross (Colgate-Palmolive-Peet Co.). *U. S. 2,435,159.* The process of recovering substantially pure oleic acid from a mixture containing oleic and polyunsaturated higher fatty acids comprises saponifying said mixture of acids with alkali, subjecting the soap produced to a temperature of at least about 280°C. but less than 310°C. in the presence of an excess of alkali in the proportion of 2-10 mols of alkali per mol of fatty acids, acidifying and recovering the oleic acid.

EMULSION POLYMERIZATION PROCESS. E. Arundale (Standard Oil Development Co.). *U. S. 2,434,536.* In the manufacture of synthetic rubber-like materials by the polymerization of a conjugated diolefin hydrocarbon in aqueous emulsion in the presence of an aliphatic mercaptan polymerization modifier containing 10-16 C atoms per molecule of which at least 50% is dodecyl mercaptan and in amount between 0.125% and 0.5% based on the water present in the emulsion, the improvement comprises adding a portion up to 50% of the mercaptan modifier to the emulsion initially and adding the remainder of the modifier in a plurality of steps.

LUBRICANTS. A. Beerbower and A. J. Morway (Standard Oil Development Co.). *U. S. 2,434,539.* The lubricant contains equal parts by weight of dehydrated activated lithium hydroxide, and lubricating oil and a relatively very small amount of a 50/50 mixture of lithium oleate and lithium napthenate.

RUST PREVENTIVE LUBRICATING OIL COMPOSITIONS. G. W. Duncan (Standard Oil Development Co.). *U. S. 2,434,490.* Sorbitan mono-oleate is used as an anticorrosive in lubricants.

MANUFACTURE OF GREASES. B. H. Thurman (Benjamin Clayton). *U. S. 2,433,636.* This is a continuous method for making lubricating greases from soaps and mineral oil fractions.

Drying Oils

Edited by
ROBERT E. BEAL

SAFFLOWER: POTENTIAL OIL CROP FOR PAINT. A. T. Pugsley and G. Winter (Maribyrnong, Victoria, Australia). *Australia, Dept. Munitions, Munitions Supply Labs., Rept. 171,* 57 pp. (1947). Field experiments with several strains of safflower in South Australia indicated that this plant is suitable as an oil-bearing crop in the wheat area of that country. The oil fraction from one variety had d^{25}_{25} 0.922, n^{25}_{D} 1.4745, viscosity at 25°, 48.4 cs., color (Lovibond 1 cm. cell) 0.8 R 14 Y, oil absorption ZnO 15%, acid value 1.1, sapon. value 190, I No. (Wijs 1 hr.) 146.0, insol. bromides trace, thiocyanogen value 85.9, unsaponifiable 0.7%, satd. acids (Bertram method) 8.6%. The amts. of component acids in the oil samples were figured from the above results and confirmed by ultraviolet spectrophotometric methods (the oil was first isomerized in glycerol). The latter method gave oleic 15.5%, linoleic 76.9%, and satd. 7.6%, while the thiocyanogen method (absence of linolenic acid is assumed) gave oleic 19.0%, linoleic 75.2%, satd. 5.8%; oleic 17.9%, linoleic 71.9%, linolenic 2.6%, and satd. 7.6% when the presence of linolenic acid was assumed. Safflower oil dries in about the same time as linseed oil when driers are added and bodies slower than linseed initially but at about the same rate after a viscosity of 30 poises is reached. Safflower oil alkyd and modified phenolic varnishes dried as fast as their linseed oil counterparts, the dried films were slightly softer, and water and alkali resistance slightly better. Safflower oil paint films had less yellowing tendency, better gloss retention, and equal durability to linseed oil paints. (*Chem. Abs., 42,* 1434.)

CONDENSATION OF PHENOL WITH DRYING OILS. P. A. Doshi and T. N. Mehta (Univ. of Bombay). *J. Sci. Ind. Research 6B,* No. 5, 63-6 (1947). Phenol is condensed with linseed oil and methyl esters of linseed oil in the presence of acid catalysts. Maximum condensation is obtained with 3% oxalic acid based on phenol after 6 hours' refluxing and 2 hours' heating in the open at 250°. Sulfuric acid catalyzes the reaction at 100°, gaseous HCl causes interesterification and P_2O_5 is not active below 250°. Ethylenic linkages in the linseed oil are attacked. (*Chem. Abs. 42,* 1434.)

CONJUGATED LINKAGES IN THE CARBON CHAIN AND THEIR ROLE IN THE SURFACE COATING INDUSTRY. F. Armitage and J. A. Cottrell. *Paint Technol. 12,* 426-8 (1947). The chemistry of conjugated double bonds is reviewed. (First of a series of articles.)

THE SPECTROPHOTOMETRIC DETERMINATION OF SMALL PROPORTIONS OF LINOLENIC ACID IN FATS. T. P. Hilditch and R. K. Shrivastava (Univ. of Liverpool). *Analyst 72,* 527-31 (1947). Mixed acids from a number of vegetable oils were crystallized from acetone at —60° and the soluble portions analyzed for linolenic acid spectrophotometrically and by the hexabromide method. Except for niger seed and soybean oils the hexabromide test was negative although positive tests were expected for a number of oils from spectrophotometric evidence. Linolenic acid is concluded to be present in only minute amounts if at all, in samples of cottonseed, groundnut, maize, sesame, and sunflower oils studied but in larger amounts in niger seed and soybean oils. It is recommended that spectrophotometric values after alkali isomerization, not exceeding $E^{1\%}_{1cm.}$ 10 at 268 $m\mu$, should not be calculated as linolenic acid unless confirmed by a hexabromide test on a concentrate of the unsaturated acids.

THE RATIONAL EVALUATION OF DRYING OILS. SOME POSSIBLE PRACTICAL ALTERNATIVES TO LINSEED OIL. T. P. Hilditch. *J. Oil & Colour Chemists' Assoc. 31,* 1-16 (1948). Examination of a number of drying, semi-drying, and non-drying oils for their component fatty acids indicates that a satisfactory drying oil should contain more than 65% of polyethanoid fatty acids. Nearly all glyceride molecules will then have two such acids if random distribution exists. The product of % polyethanoid fatty acids and % linolenic acid times .01 should exceed 25 for an oil to be fast drying. A British survey shows that conophor oil is superior to, and lumbang and candlenut oils suitable substitutes for linseed oil but if these colonial oils are to be stored for long periods in warm climates they should first be heated to 100° to destroy hydrolytic enzymes. Blends of drying and semi-drying oils might be improved by interesterification to improve the distribution of polyethanoid fatty acids.

THE CHEMISTRY OF CASTOR OIL DEHYDRATION. C. P. A. Kappelmeier, W. J. van Goor, and R. van Helden (Laboratorium van Sikkens' Lakfabrieken, Sassenheim, Holland). *Verfkroniek 21,* 8-11 (1948). The hydroxyl value of methyl esters of fatty acids from completely saponified dehydrated castor oil is considerably higher than that of the dehydrated oil from which they were obtained. During the dehydration of castor oil with an acid catalyst considerable ester interchange occurs between the glycerides and the secondary hydroxyl groups of ricinoleic acid. Free glycerol groups are subsequently dehydrated.

SEASONAL AND GEOGRAPHICAL VARIATIONS IN TALL OIL COMPOSITION. W. H. Jennings. *Paper Trade J. 126,* No. 9, 137 (1948). The fatty acid content of tall oil varies from 40 to 55% with different Southern U. S. geographical locations but the fatty acid composition is nearly constant at approximately 45% oleic, 51% linoleic, and 4% linolenic. No saturated acids could be detected.

PATENTS

ESTER-INTERCHANGE OF GLYCERIDES. Lever Brothers and Unilever, Ltd. *Brit. 590,951.* Oils with superior properties for making varnish are prepared by treating oils at 250°-300° under 20-40 mm. absolute pressure with vapors of lower alkyl esters of fatty acids of higher molecular weight in the presence of sodium methoxide. An apparatus for the continuous removal of the lower-boiling esters formed is described. (*Chem. Abs. 42,* 1075.)

FATTY ACIDS WITH CONJUGATED DOUBLE BONDS. British Paints, Ltd. and P. Slansky. *Brit. 590,784.* Passing unconjugated, unsaturated fatty acid vapors over amorphous silica, activated fuller's earth, metal silicates, oxides (except alkali metals), or metals (except alkali and alkaline earths) at a temperature below 300° under vacuum and with a one-minute contact time effects conjugation. (*Chem. Abs. 42,* 1075.)

POLYAMIDES FROM POLYOCTADECAPOLYENYLAMINE. H. M. Teeter and J. C. Cowan (to U. S. Secretary of Agriculture). *U. S. 2,435,478.* Polymeric fat acids or their esters are reacted with polyoctadecapolyenylamine at 150° to 250°C. to produce a polyamide.

DIMERIC OCTADECADIENONITRILE. H. A. Bruson and W. D. Niederhauser (The Resinous Products & Chemical Co., Philadelphia, Pa.). *U. S. 2,435,554.* Dimeric octadecadienonitrile, a pale yellow oil derived from a drying oil, is claimed as a new product.

Soap and Perfume

Edited by
LENORE PETCHAFT

SEQUESTERING AGENTS. H. W. Zussman (Alrose Chemical Co., Providence, R. I.). *Soap Sanit. Chemicals 24,* No. 2, 57-9, 171, 173, 189 (1948). A sequestering agent is defined as a water soluble ion exchange system which is capable of converting calcium, magnesium, iron, etc. to a deionized but water soluble form. A new type of sequestering agent, a polyamino carboxylic acid salt is described. Results of tests on the effect of pH and concentration, stability, toxicity, skin irritation, and sudsing and foaming properties are reviewed. The amounts of the sequestering agent to be used depends on the local hardness of the water and the industrial application.

SYNTHETIC DETERGENTS VS. SOAP. Kenneth T. King (E. I. du Pont de Nemours & Co., Wilmington, Delaware). *Soap Sanit. Chemicals 24,* No. 2, 53-4 (1948). A review.

SOAP PERFUMES. Samuel Klein (Synfleur Scientific Laboratories, New York). *Soap Sanit. Chemicals 24,* No. 2, 50-2, 189, 191 (1948). Problems involved in soap perfuming include behavior and persistence of individual aromatics when in contact with soap base, stabilization to reduce or avoid deleterious changes in color, odor or persistence, packaging protection of soap cake to reduce odor loss in finished product, and control of aromatic raw materials to prevent deterioration while in storage. Lists of natural and synthetic aromatics used in soap perfumes are given. The results of stability tests run on 85 perfumes classified as flowery, fruity, citrus, herbaceous, animal, spicy, balsamic, rosy, and earthy-woody over a two-week period are reported. Typical formulas for soap and sanitary products perfumes are given along with recommendations on compounding procedures.

SYNTHETIC DETERGENTS IN TEXTILE PROCESSING. H. C. Borghetty (General Dyestuff Corp., New York). *Am. Dyestuff Reptr. 37,* 112-13, 130 (1948). A general review article which describes the replacement of soap by various synthetic detergents in textile processes. Anionic, cationic, and nonionic types are characterized. Emphasis is placed on the necessity of careful selection of synthetic detergents used in the right way under the right conditions.

SOAP FROM SYNTHETIC FAT ACIDS. IV. H. P. den Otter (Vlaardingen, Netherlands). *Chem. Weekblad 43,* 740-7 (1947). A sample of synthetic fat acids as used in Germany in 1943-4 was found to have a composition approximately similar to that of a mixture of 50% coconut-oil fat acids and 50% lard fat acids, but to contain little oleic acid. On preparation of the Na soap, fat acid losses of 5% were observed. The soap contained 0.71% NaCl. Compared with soaps made from natural fat acids it was lacking in plasticity; it suffered greater loss in use, its foam was equal in quantity but less stable; its cleaning power was inferior; its odor was disagreeable. (*Chem. Abs. 42,* 1439.)

SOAPS AND SYNTHETIC DETERGENTS IN THE TEXTILE FIELD. Anthony M. Schwartz (Harris Research Laboratories, Washington, D. C.). *Soap Sanit. Chemicals 24,* No. 2, 47-9, 136 (1948). The various uses of surface active agents in different stages of textile processing are reviewed. Many of these agents may be used to perform more than one function at a time, e.g. scouring, softening, emulsifying, etc. A good textile detergent should provide efficient, thorough, uniform removal of known soils under a set of fairly rigid and well specified conditions. They must not adversely affect the fabric itself or subsequent finishing operations, nor leave residual color or odor forming residues on the fabric. Accurate testing and evaluation of different detergents is possible as actual operating conditions are easily duplicated. Future research is outlined with emphasis on recognizing the differences among the synthetic detergents and selection of one best suited to the various operations under correct conditions.

WOOL PIECE GOODS SCOURING WITH A SYNTHETIC ORGANIC DETERGENT. O. M. Morgan (National Aniline Division, Allied Chemical & Dye Corp., Buffalo, N. Y.). *Am. Dyestuff Reptr. 37,* 93-5 (1948). Tests conducted in laboratory scouring equipment as well as in dolly washers and continuous scouring machines have indicated that Nacconol NR, a synthetic organic detergent, is very efficient for the removal of emulsified mineral oil and lard oil lubricants from wool piece goods. This detergent may be used by itself or may be built with suitable salts such as sodium chloride or sodium bicarbonate. Best scouring results are obtained under neutral or slightly alkaline conditions. High alkalinity should be avoided. The type of salt used as a builder for this synthetic detergent has an important bearing on the scouring efficiency.

SCOURING WOOL RAW STOCK WITH A SYNTHETIC ORGANIC DETERGENT. O. M. Morgan (National Aniline Division, Allied Chemical & Dye Corp., Buffalo, N. Y.). *Am. Dyestuff Reptr. 37,* 96-9 (1948). Methods of wool scouring, equipment used and scouring data are reviewed. It was reported that Nacconol NR is ideally suited for scouring wool raw stock. It is not affected by lime. Its scouring action is rapid. It provides for rapid wetting of the wool by the alkaline scouring liquors; aids in the removal and emulsification of the wool grease and in addition to being rapidly rinsable in its own right, it accelerates the rinsing of the alkali from the wool. Other factors discussed include effect of synthetic detergent concentration, effect of pH and choice and amount of alkali builder.

CONTROL OF THE FATTY ACID CONTENT OF FLOATING SOAPS. Karl Gerner. *Fette u. Seifen 51,* 111-13 (1944); *Chem. Zentr. 1944, II,* 1134-5. According to manufacturing directions, floating toilet soap should contain 40 g. of fatty acid and standard floating toilet soap should contain 9.8 g. of fatty acid + alkyl sulfonic acid, in which the permissible variations are ±1 g. and 0.5 g., respectively. Further a definite relationship between cubic contents and fresh weight is required, which calculated as D is 0.733 for floating toilet soap and 0.454 for standard floating toilet soap. Accurate determination of fatty acid content exhibits difficulties, which are discussed. With unfilled soaps it is possible to obtain an approximate determination of fatty acid content by indirect means, in that a definite relationship exists between fatty acid content and H_2O content. For H_2O content the xylene method and the Brabender rapid method are suitable. The relationship of H_2O content to the piece weight in the case of toilet soap and standard floating toilet soap is given. On the basis of a graph it is shown that from the plotted individual constituents the percentage composition of the soap at any point can be calculated. (*Chem. Abs. 42,* 1439.)

WASHING MEDIA FOR ALUMINUM APPARATUS. L. Karunina. *Myasnaya i Molochnaya Prom. 1947,* No. 6, 75-6. Al plates were immersed for various periods in the following solutions at room temperature and elevated temperature: 0.1-0.3% NaOH, 0.25-1.0% Na_2CO_3, 0.25-0.5% Na_3PO_4, 0.5% Na_2CO_3-0.5% Na_3PO_4, the above solutions with addition of varying amounts of Na silicate (to give a silicate protective film), and finally 0.25-1% common household soap. All alkaline solutions had corrosive action on Al, with Na_3PO_4 being intermediate between NaOH and calcined soda. Small additions of Na silicate aggravate corrosion by NaOH, and the protective effect does not begin until the silicate is used in an amount double that of NaOH. Addition of 0.025-0.05% Na silicate to the Na_2CO_3 solutions (about 0.5%) sharply reduced corrosion, and 0.5% Na silicate stopped it completely; a similar result was observed with 0.5% Na_3PO_4. The use of 0.5% Na_3PO_4, 0.5% Na_2CO_3, and 0.25% Na silicate gave almost no effect on the Al plates at either room or elevated temperature. Soap did not induce corrosion. (*Chem. Abs. 42,* 1439.)

A NEW TYPE OF MICELLE: SOAP WITH ALCOHOL, AMINE, OR OTHER POLAR-NONPOLAR MOLECULES. W. D.

Harkins, R. W. Mattoon, and R. Mittelmann (Univ. of Chicago). *J. Chem. Phys. 15,* 763-4 (1947). The uncorrected Bragg spacing d_M for K caprate at 10° is 31.7 Å.; for K laurate at 12° is 35.3 Å; for K myristate at 14° is 40.3 Å. When an aqueous solution of K myristate is saturated with C_6H_6, or Na dodecyl sulfate with PhEt or n-C_7H_{16} at 25°, the micelle thickness is increased by 11.7 Å., 6.7 Å., and 7.1 Å., respectively. The "oil" molecules do not penetrate between the hydrocarbon chains: the area per soap molecule remains constant. The "oils" are solubilized in the middle of the micelle between the ends of the hydrocarbon chains of the soap molecules. When the "oil" is n-$C_7H_{15}OH$, n-$C_8H_{17}OH$, n-$C_{10}H_{21}OH$, or n-$C_{10}H_{21}NH_2$, the micelle thickness changes by maximum values of —2.0 Å to + 2.3 Å. Molecules of long-chain alcohols, amines, or similar polar-nonpolar compounds, when dissolved in an aqueous solution of soap or similar colloidal electrolyte, will actually penetrate between the soap molecules and produce a larger mixed micelle. The critical micelle concentration is not sensitive to solubilized hydrocarbons, but is substantially decreased by small concentrations of n-BuOH or n-$C_7H_{15}OH$. The total solubility of "oils" in aqueous micellar solutions is classified: (1) solubility in water, or in nonmicellar solution, (2) solubility by adsorption on the outer surface of the micelle, (3) solubilization in the middle of the micelle, and (4) solubility by penetration into the micellar soap layer. (*Chem. Abs. 42,* 808.)

PATENTS

STABILIZED SOAPS. Ellis R. White (Shell Development Co., San Francisco, Calif.). *U. S. 2,435,333.* Soaps may be stabilized by the addition of a small amount of a non-gaseous aromatic amino carboxylic compounds such as the aluminum salt of alpha (anilido para hydroxy) stearic acid.

APPARATUS AND PROCESS FOR ELECTRONIC DRYING OF SOAP. Andrew N. Jergens. *Brit. 595,194.* Method of drying semiplastic soap by subjecting the soap to the influence of an electronic dielectric heating zone of high frequency while traveling on an endless conveyor and removing vapors from the drying zone by a current of air.