ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: J. G. Endres, Kazuo Fukuzumi, J. Iavicoli, K. Kitsuta, F. A. Kummerow, Gladys Macy, E. G. Perkins, T. H. Smouse and J. A. Thompson

• Fats and Oils

COMPARISON OF TWO METHODS FOR THE SEPARATION OF POLAR FROM NONPOLAR LIPIDS. L. Hartman (Food Chem. Div., Dept. of Scientific and Indust. Res., Wellington, New Zealand). *J. Lipid Res.* **8**, 285–6 (1967). The countercurrent extraction method of Galanos and Kapoulas for the separation of phospholipids from triglycerides was compared with dialysis in petroleum ether in an apparatus modified from that of Eberhagen and Betzing. The efficiencies of the methods are similar, but dialysis, which is slower, can yield triglycerides that are entirely free from phosphorus. The behavior of free fatty acids and mono-glycerides is also described.

STEREOSPECIFIC ANALYSIS OF TRIGLYCERIDES: AN ALTERNATIVE METHOD. H. Brockerhoff (Fisheries Res. Board of Canada, Halifax Lab., Halifax, Nova Scotia, Canada). *J. Lipid Res.* **8**, 167–9 (1967). A new method for the stereospecific analysis of triglycerides is demonstrated on a corn oil which had been analyzed by an earlier method. The triglyceride (1,2,3-triacyl *L*-glycerol) was partially degraded by means of methyl magnesium bromide. The 1,3-diglyceride was then isolated, and converted into *L*-2-phosphatidyl phenol, from which phospholipase A cleaved the fatty acids from position 1. The remaining lysophosphatide was analyzed to yield the fatty acids at position 3 of the original triglyceride. The fatty acid composition of position 2 was determined after hydrolysis of the corn oil with pancreatic lipase. This method has the advantage over the one reported previously of yielding direct analyses of the fatty acids in each of the three positions.

GAS-LIQUID CHROMATOGRAPHY OF 2-CHLOROETHYL ESTERS USING A DETECTOR SPECIFIC FOR HALOGENS. A. Karmen (Johns Hopkins Med. Institutions, Baltimore, Md. 21205). *J. Lipid Res.* **8**, 234–8 (1967). The gas-liquid chromatography of 2-chloroethyl derivatives of short- and long-chain monocarboxylic acids, and of short-chain dicarboxylic acids and aldehydes has been studied with a dual-flame ionization detector that provided simultaneous records of the concentrations of chlorine and of total organic material in the column effluent. The chloroethyl derivatives of dicarboxylic acids and aldehydes could be distinguished from the chlorethyl esters of monocarboxylic acids on the basis of different ratios of responses of the two detectors. Analysis of a mixture of chloroethyl derivatives prepared from a natural product revealed that several compounds that might ordinarily have been identified as unsaturated or branched-chain fatty acid esters on the basis of their retention times had the higher chlorine content characteristic of chloroethyl derivatives of aldehydes or dicarboxylic acids.

DEVICE FOR EVAPORATION OF SOLVENT FROM SMALL SAMPLES. R. J. Komarek (Dept. of Animal Industries, Univ. of Conn., Storrs, Conn. 06268). *J Lipid Res.* **8**, 287–8 (1967). A device for the simultaneous evaporation of six samples under separately controlled streams of nitrogen is described.

EVALUATION AND CORRELATION OF RESOLUTION INDEXES OF POLAR CHROMATOGRAPHIC SOLVENTS. C. R. Perisho, Anita Rohrer and J. A. Thoma (Dept. of Chem., Indiana Univ., Bloomington, Ind.). *Anal. Chem.* **39**, 737–44 (1967). Two proposed chromatographic indexes, the ratio of $\Delta\mu_1/\Delta\mu_2$ and the ratio of A_m/A_s, are evaluated for a large number of aqueous polar chromatographic systems. The predictions that Martin's treatment is applicable to these systems, that the ratio of the free energies of transfer, $\Delta\mu_1/\Delta\mu_2$, is insensitive to solvent variations, that R_m is linear function of the mole fraction of water in the solvent, and that the cross-sectional area ratio, A_m/A_s, is operationally constant are all experimentally verified. The experimental data indicate that $\Delta\mu_1/\Delta\mu_2$ rather than α_1/α_2, the ratio of partition coefficients, should be considered the constant and more thermodynamically descriptive index of systems undergoing alteration of the solvent. The former ratio rather than the latter is more useful for the correlation, prediction, and understanding of chromatographic phenomena.

GUIDELINES FOR SELECTION OF CHROMATOGRAPHIC CONDITIONS. J. A. Thoma and C. R. Perisho (Dept. of Chem., Univ. of Ark., Fayetteville, Ark.). *Anal. Chem.* **39**, 745–55 (1967). An index of resolution, I_r, is defined as the distance between spot centers, ΔR_f less the sum of the semi-major axes of two close-lying spots. Simulation studies of polar chromatographic systems indicated that I_r is a maximum in the locale of $R_f = 0.25$. The theoretical computations were confirmed by chromatographic investigation of the effectiveness of various solvents in separating glucose and fructose. On the basis of these studies recommendations are made for the systematic design of chromatographic conditions of high resolving power.

AN EXPERIMENTAL STUDY OF COLUMN EFFICIENCY IN LIQUID-SOLID ADSORPTION CHROMATOGRAPHY. L. R. Snyder (Union Oil Co. of Calif., Union Res. Center, Brea, Calif.). *Anal. Chem.* **39**, 698–704 (1967). The separation efficiency of columns in liquid-solid adsorption chromatography has been studied in terms of column theoretical plate numbers. Height equivalent of a theoretical plate (HETP) values have been studied as a function of all the important separation variables associated with normal liquid-solid column chromatography: sample retention volume, sample size, adsorbent type, adsorbent activity, adsorbent particle size, solvent type, solvent flow rate, column packing procedure and column diameter. Bed permeability values are given also in order to establish the column pressure drop required in a given separation. These data permit the calculation of theoretical plate numbers for any set of operating conditions and the rapid selection of optimum conditions for a given separation. Comparisons of the present data with contemporary theory and previous experience show certain interesting anomalies.

MAXIMUM RESOLUTION PER UNIT TIME IN LIQUID-SOLID ADSORPTION CHROMATOGRAPHY. *Ibid.*, 705–9. Experimental conditions which correspond to maximum resolution per unit time are summarized for separation by liquid-solid (adsorption) column chromatography (LSCC). Maximum resolution is limited principally by separation time, column length, and column pressure. For column pressures as great as 100 atm, and separation times of 72 hours, as many as 60,000 theoretical plates can be obtained. Separations by thin layer chromatography (TLC), on the other hand, are normally limited to about 300 theoretical plates. While special techniques may extend the number of plates in TLC separation to as many as 1500, LSCC appears uniquely useful in the area of very difficult sample separations.

GEOMETRIC CONFIGURATION AND ETHERIFICATION REACTIONS OF SOME NATURALLY OCCURRING 9-HYDROXY-10,12- AND 12-HYDROXY-9,11-OCTADECADIENOIC ACIDS. R. G. Powell, C. R. Smith, Jr., and I. A. Wolff (Northern Reg. Res. Lab., Peoria, Ill. 61604). *J. Org. Chem.* **32**, 1442–6 (1967). The hydroxy acids in *Xeranthemumannuum* seed oil are shown to be 9-hydroxy-*trans*-10,-*cis*-12-octadecadienoic and 13-hydroxy-*cis*-9,*trans*-11-octadecadienoic acids. Their geometric configurations were established by partial reduction of the corresponding methyl esters (1 and 2) with diimide, and subsequent oxidative cleavage of the isolated *cis*-monoene products. Hydrazine in the presence of oxygen proved unsuitable as a diimide source for reduction of 1 and 2, but potassium azodicarboxylate was used successfully for this purpose. The acid-catalyzed etherification reactions of these conjugated dienols (1 and 2), as well as of their allylic reduction products (4 and 11), were explored.

SUBSTITUTED BIPHENYLS AND TERPHENYLS AS OXIDATIVELY AUTOINHIBITIVE COMPOUNDS. Helen E. Mertwoy and H. Gisser (Pitman-Dunn Res. Lab., Frankford Arsenal, Philadelphia, Pa. 19137). *Ind. Eng. Chem.* **6**, 108–12 (1967). In a study of oxidatively autoinhibitive biphenyls and terphenyls, sec-butylbenzenes having phenyl, methoxyphenyl, sec-butylphenyl or tert-butylphenyl substituted in the ring, either singly or in combination, were prepared and their autoxidation rates were measured at 100C. Whereas sec-butylbenzene oxidized in less than 24 hours, all of the substituted compounds except 4-sec-butyl-4′-tert-butylbiphenyl, were stable for at least 100 hours. The latter compound, however, oxidized at a much slower rate than sec-butylbenzene. The stability of these compounds was attributed to autoinhibition which results when the tendency to increase oxidation rate by electron-donating substituents is outweighed by the effectiveness of the inhibitor formed. The inhibitors are presumably hydroxybiphenyls or terphenyls and are a decomposition product of the hydroperoxide produced via autoxidation at the tertiary carbon. As confirming evidence that inhibitors are formed, it was found that 4-sec-butylbiphenyl and 4-sec-butyl-4′-methoxybiphenyl in mixtures with sec-butylbenzenes exterted a distinct oxidation-inhibiting effect on the latter. Most of the compounds were found to be nonspreading fluids.

A NEW MASS DETECTOR FOR LIQUID CHROMATOGRAPHY. J. G. Lawrence and R. P. W. Scott (Unilever Res. Lab., Colworth House, Sharnbrook, Bedford, England). *Anal. Chem.* **39**, 830–2 (1967). A new detector based on the principle of collection and continuous weighing of the nonvolatile components from a chromatographic column is described. The mobile phase is removed by flash evaporation at the sample collection surface. The detector is quantitative, has good long-term stability, and can be used with buffered solutions when the buffer is volatile. Examples of the detector's application are given.

A NEW CONVENIENT METHOD FOR THE RAPID QUANTITATIVE DETERMINATION OF UNSATURATION VIA HYDROGENATION. C. A. Brown, S. C. Sethi and H. C. Brown (R. B. Wetherill Lab., Purdue Univ., Lafayette, Ind. 47907). *Anal. Chem.* 39, 823–6 (1967). A new procedure for the *in situ* preparation of highly active hydrogenation catalysts has been combined with the automatic valve for the generation of hydrogen from sodium borohydride to provide a new, convenient technique for the determination of unsaturation through quantitative hydrogenation. Results are reported for hydrogenation of several compounds, including different vegetable oils and the difficultly-reduced Δ-9,10-octalin. The method is rapid, simple, quantitative and offers major advantages for the determination of unsaturation in many types of compounds as compared with other known methods.

BÖMER NUMBER. VI. CRYSTAL STRUCTURE OF GLYCERIDE BY X-RAY DIFFRACTION. Masao Imamura, Isao Niiya, Masakazu Okada and Taro Matsumoto. *Yukagaku* 16, 174–7 (1967). As a method for detection of foreign fats in lard, distance of long spacings in β-form crystal was measured with X-ray small angle scattering apparatus. The values of (001) in lard were to be 44.2 Å and there was no difference among the same species. These were 45.3 Å in beef tallow and 44.9 Å in horse fat. There was a linear correlation between the values of (001) and composition when lard was mixed with beef tallow, hydrogenated lard and horse fat, and the amount of foreign fat can be calculated from this curve. Clear and characteristic phenomenon was found by mixing of 20–40% of beef tallow and 20% of hydrogenated lard, resulting 2 solid solutions and a large value of (001). Distance of the long spacings of crystallized glyceride obtained by the Bömer method was found to be 44.6 Å in either lard or beef tallow, there being no difference. Rearrangement velocity was faster in lard and slower in beef tallow.

UTILIZATION OF CONCENTRATE CONTAINING TOCOPHEROLS. I. SEPARATION OF CONCENTRATED COMPONENTS BY THIN-LAYER CHROMATOGRAPHY AND SOME PROPERTIES OF REDUCING SUBSTANCES. Takahiro Takeuchi and Toyokazu Tatsukawa (Ind. Research Inst., Hyogo Pref.). *Yukagaku* 16, 185–93 (1967). Condensates obtained from deodorization of vegetable oils were found to contain 1–10% of tocopherols. A concentrate containing 42.6% α-tocopherol was prepared by means of esterification and vacuum, steam distillation of soybean oil condensate. Six fractions were obtained on thin-layer chromatographic plates. These fractions were: least polar fraction (I) such as hydrocarbons and squalene, intermediate polar fraction (II) such as tocopherol, more polar fraction (III) such as alcohols and sterols, I + II, I + III, and II + III. In addition to the above components, other components were fund which reacted with the Emmerie-Engel reagent. These were found to be β-, γ- and δ-tocopherol.

IDENTIFICATION OF FLAVOR COMPOUNDS DEVELOPED DURING STORAGE AT LOWER TEMPERATURE OF HYDROGENATED COCONUT OIL. Kosaku Yasuda, Maromi Takeda and Yoshinori Horio (Nissin Oil Mills, Ltd., Yokohama). *Yukagaku* 16, 181–5 (1967). Hydrogenated coconut oil developed a strong and characteristic odor during storage at around 5C for 2 months, while its development was seldom encountered during storage for 2 months at 20C. The volatile materials developed during storage of hydrogenated coconut oil at 5C and 20C for 2 months were collected by deodorization into dry ice traps. Odorous components of the volatile matter were fractionated by gas chromatography, and identified chemically by their IR spectra and retention times. The development of characteristic odor during the storage of hydrogenated coconut oil at 5C was caused by the appearance of free fatty acids which were produced during the storage. Hexanoic and octanoic acids accounted for the greater share of the odor. Splitting of the oil during the storage seemed to occur selectively in the ester bonds of the lower fatty acids. More non-acidic volatile compounds were found in hydrogenated coconut oil stored at 20C than that stored at 5C but those seemed to have no relation to the characteristic odor.

REFINING PLANT OF OILS AND FATS BY CENTRIFUGAL SEPARATOR. Toshio Kitakawa (Tomoe Eng. Co., Tokyo). *Yukagaku* 16, 235–48 (1967). Review with 30 references.

RECENT PROBLEMS AND PRACTICE ON REFINING AND DEODORIZATION OF OILS. Kosaku Yasuda and Hisashi Watanabe (Nissin Oil Mills Ltd., Yokohama). *Yukagaku* 16, 259–66 (1967). A review with 74 references.

GENERAL VIEW OF THE RECENT CHILLING AND WORKING EQUIPMENTS FOR MARGARINES AND SHORTENINGS. Junsaku Tsuji (Nippon Oil & Fat Co., Tokyo). *Yukagaku* 16, 275–83 (1967). A review with 21 references.

INSTALLATION OF SODIUM REDUCTION OF SPERM OIL. Hisashi Fujii (Nippon Suisan K. K., Tokyo). *Yukagaku* 16, 306–10 (1967). A review.

CONTINUOUS SOLVENT EXTRACTION PLANT FOR VEGETABLE OIL. Kimio Nishino (Chiyoda Chem. Eng. & Construction Co., Tokyo). *Yukagaku* 16, 224–34 (1967). Review with 19 references.

DEODORIZING SYSTEMS FOR OILS AND FATS. Shunichi Yoshino (Yoshino Seisakusho K. K., Osaka). *Yukagaku* 16, 249–58 (1967). A review.

RELATION OF DEODORIZATION OF FAT AND FRYING EQUIPMENT. Etsuji Yuki (Food Ind. Expl. Station, Hiroshima Pref.). *Yukagaku* 16, 284–9 (1967). A review with 52 references.

VACUUM FRACTIONATING APPARATUS AND MOLECULAR DISTILLATION EQUIPMENT. Hiroshi Nakagawa (Nippon Sanso K. K., Tokyo). *Yukagaku* 16, 267–74 (1967). A review with 18 references.

THE INFLUENCE OF WATER AND EMULSIFIERS ON THE CONSISTENCY OF MARGARINES. E. Sambuc and M. Naudet (Nat. Lab. of Fatty Substances (ITERG), Fac. of Sci., Marseille, Fr.). *Rev. Franc. Corps Gras* 14(2), 91–98 (1967). The consistency of margarine increases as the water content rises from 0 to 10%, remains constant between 10 and 20%, then decreases rapidly. The smoothness of the emulsion decreases as the water content rises. The study of products containing 0 and 4% of monoglycerides or lecithins or both emulsifiers in various proportions shows that, independent of the length of the fatty acids contained in them, monoglycerides increase and lecithins decrease margarine consistency. Smoother emulsions are made with lecithins than monoglycerides and the emulsions became smoother as the level of emulsifier is increased.

NEW ANALYTICAL SPECIFICATIONS FOR DEFINING THE QUALITY OF EDIBLE LARD AND TALLOWS. M. Loury and M. Forney (Lab. Jean Ripert, Inst. of Fats and Oils, Paris, Fr.). *Rev. Franc. Corps Gras* 14(2), 81–90 (1967). The common analytical values (acid, iodine and peroxide value) do not clearly define the quality of an edible fat. A simple colorimetric method, called the chloroplatinate color method, has been developed which can be used to differentiate quality. A new colorimetric scale is used with this method based upon the Hazen scale. In addition to the new colorimetric method, the U.V. spectral curve in the 280 μm region is used to differentiate tallows.

INFLUENCE OF LIGHT AND TEMPERATURE ON THE AUTOXIDATION OF SUNFLOWER SEED OIL. A. Popov, I. Mizev and N. Yanishlieva (Chem. of Lipids, Inst. of Org. Chem., Acad. of Sci. of Bulgaria, Sofia, Bulgaria). *Rev. Franc. Corps Gras* 14(2), 75–80 (1967). A comparative study of the action of light and temperature on the autoxidation of refined sunflower seed oil was made. The study was made at temperatures of 60, 80, 100, 120 and 140C and in the dark, in diffused light and sunlight. Changes in the oil were followed by measuring the peroxide value and by use of thin-layer chromatography.

INFLUENCE OF CELLULAR STRUCTURE OF OIL SEEDS ON THEIR TECHNOLOGICAL BEHAVIOR. M. Rac (Univ. of Zagreb, Yugoslavia). *Rev. Franc. Corps Gras* 13(4), 223–228 (1967). The cellular structure of oil seeds has a pronounced effect on the rate of extraction and the yield when solvent extraction is used. The principal dimensions, length, width, thickness and area, of nine seed types were measured. Photomicrographs of lengthwise and crosswise sections of seeds are shown. The seeds were granulated in three sizes, 0.8 to 1.2 mm; 0.5 to 0.8 mm and 0.25 to 0.5 mm. Extraction yields were obtained during a 30 minute period. Granulation plays an important function in yield with most seed types. Copra is least influenced, while linseed is most influenced by granulation. Curves are shown which demonstrate the relationship between granulation and time of extraction.

AN ACCURATE METHOD FOR THE DETERMINATION OF ELAIDIC ACID IN FATTY MATERIALS. THE TECHNIQUE OF THICK-LAYER CHROMATOGRAPHY ON SILICA GEL IMPREGNATED WITH SILVER NITRATE. R. Perron, P. Blanchard, H. Chaveron and M. Auffret (Lab. of Lipochem. of C.N.R.S. Rue Henri-Dunant-94 Thiais, Fr.). *Rev. Franc. Corps Gras* 14(4), 241–250 (1967). An accurate method for the determination of elaidic acid in fatty materials based upon the separation of this acid on thick layers of silver nitrate impregnated silica gel is given. Sample size is 100 to 200 mg. Special spreading techniques must be used and are fully described. Using methyl myristate as an internal standard, elaidic acid is collected from the plate and analyzed by GLC. The method is accurate to 0.5% of elaidic acid in a fat, and down to 0.1% can be detected.

• Biochemistry and Nutrition

The effect of restricted caloric intake upon the egg weight response to dietary corn oil. D. J. Bray (Dept. of Animal Science, Univ. of Illinois, Urbana 61803). *Poultry Sci.* **46**, 476–84 (1967). When 8 parts of corn oil were substituted for 20 parts of starch in corn-soya diets, there was an increase in the egg weight and body weight of pullets. Egg weight was increased to a lesser extent when the diet was diluted with cellulose to the extent that voluntary available calorie intake did not support an increase in body weight. However, when the gain in body weight was prevented by limiting the time that feed was before the pullets, there was no increase or a decrease in egg weight. Possible mechanisms for the effect of dietary fats and fatty acids upon egg weight are discussed in light of these and previous findings.

Synthetic and structural investigations on 3-phosphatidyl-1′-(3′-O-L-lysyl) glycerol. P. P. M. Bonsen, G. H. de Haas, and L. L. M. van Deenen (Dept. of Biochem., Lab. of Organic Chem., The Univ. of Utrecht, Utrecht, The Netherlands). *Biochemistry* **6**, 1114–20 (1967). The synthesis is described of the lysyl ester of phosphatidylglycerol in the same stereochemical configuration as that of the natural compound isolated from *Staphylococcus aureus*. Starting from 2,3-isopropylideneglycerol, 3-(di-N-t-butoxycarbonyl)-L-lysyl-2-0-t-butylglycerol 1-iodohydrin was prepared via eight intermediates. The latter product was allowed to react with the silver salt of 1-oleoyl-2-palmitoylglycerol 3-(0-benzyl)phosphate to give the corresponding phosphotriester. Anionic debenzylation and treatment with hydrogen chloride yielded 1-oleoyl-2-palmitoyl-glycerol-3-phosphoryl-1′-(3′-O-L-lysyl)glycerol as the dihydrochloric acid salt. The synthetic compound and the natural lysyl ester of phosphatidylglycerol from *S. aureus* had closely similar physical and chemical properties. Enzymic hydrolyses with phospholipase A, phospholipase C, and phospholipase D revealed that the two substances were completely identical in stereo-chemical configuration.

Hydrocarbons in digestive tract and liver of a basking shark. M. Blumer (Woods Hole Oceanographic Institution, Woods Hole, Mass. 02543). *Science* **156**, 390–1 (1967). The hydrocarbons of zooplankton pass through the digestive tract of the basking shark without fractionation or structural modification. They are resorbed in the spiral valve and deposited in the liver. In contrast to unsaturated fatty acids, the olefinic hydrocarbons are not decreased in concentration. The hydrocarbon assemblage in the digestive tract and in the liver is indicative of the food sources and feeding grounds of the shark. Squalene, abundant in shark liver, occurs only in traces in zooplankton; phytane, if present at all, constitutes less than 0.005 percent of the hydrocarbons of zooplankton and of shark liver.

Isolation and physicochemical characterization of a lipoprotein fraction from bovine milk. E. Berlin, S. Lakshmanan, P. G. Kliman and M. J. Pallansch (Dept. of Chem., Univ. of Maryland, College Park, Md.). *Biochemistry* **6**, 1388–94 (1967). An ultracentrifugally and electrophoretically homogeneous low-density lipoprotein fraction was isolated from disrupted microsomes of bovine milk.

Yellow bone marrow as adipose tissue. E. Zakaria and E. Shafrir (Dept. of Biochem., Hebrew Univ., Hadassah Med. School and Hadassah Univ. Hosp., Jerusalem, Israel). *Proc. Soc. Exp. Biol. Med.* **124**, 1265–8 (1967). Yellow bone marrow of guinea pig is capable of triglyceride synthesis from glucose or from free fatty acids and contains a lipolytic system susceptible to activation, particularly upon contact with pituitary hormones. Its metabolic activity is similar to homologous epididymal adipose tissue, although both guinea pig tissues are appreciably less active than the rat epididymal fat pad. The composition and the metabolic characteristics indicate that the yellow bone marrow represents a typical adipose tissue.

Lipid peroxide formation in the brain of aging rats. Masaki Yoahikawa and Shunsaku Hirai (Dept. of Geriatrics, Univ. of Tokyo, Faculty of Med., Hongo, Tokyo, Japan). *J. Gerontol.* **22**, 162–65 (1967). The effects of age and environmental factors on the lipoperoxides of the brain were studied in rats and the following results were obtained. 1) Lipid peroxide of the brain increases with age. 2) This increase of lipid peroxide may be inhibited by administration of antioxidants, such as α-tocopherol and α-tocopheryl felurate. 3) In vitamin E-deficient rats, lipid peroxides of the brain were higher than in animals fed a diet containing vitamin E. However, the difference of lipid peroxide content in the brain between control and vitamin E-deficient animals tended to decrease with advancing age. 4) The administration of peroxide of linoleic acid or acetanilid caused an increase of lipoperoxide in the brain.

Biosynthesis of fatty acids in obese mice in vivo. I. Studies with glucose-1-^{3}H(1-^{14}C), glucose-6-^{3}H(6-^{14}C), DL-lactate-2-^{3}H(2-^{14}C), and glycerol-2-^{3}H(1,3-^{14}C). W. W. Shreeve, E. Lamdin, N. Ofi and R. Slavinski (Div. of Biochem., Med. Res. Center, Brookhaven National Lab., Upton, N. Y.). *Biochemistry* **6**, 1160–1167 (1967). Rates and mechanisms of biosynthesis of fatty acids in the liver and in other tissues of the remaining carcass of obese hyperglycemic mice and their lean siblings have been investigated by isolation and counting of radioactivity in total fatty acids of mice sacrificed 90 min after intraperitoneal injection of trace amounts of carbohydrates labeled with tritium and carbon-14. The pairs of labeled carbohydrates injected were glucose-1-^{3}H and glucose-1-^{14}C, glucose-6-^{3}H and glucose-6-^{14}C, DL-lactate-2-^{3}H and DL-lactate-2-^{14}C, or glycerol-2-^{3}H and glycerol-1,3-^{14}C. All of the labeled carbohydrates (whether ^{3}H or ^{14}C) showed similar and highly significant increases of about five to eightfold greater incorporation of radioisotope into liver fatty acids of obese mice than into those of lean mice.

Long-term reduction of serum cholesterol levels of patients with atherosclerosis by small doses of neomycin. P. Samuel, C. M. Holtzman and Jane Goldstein (Dept. of Medicine, The Long Island Jewish Hospital, N. Y., N. Y.). *Circulation* **5**, 938–945 (1967). The effect and tolerance of long-term oral administration of small doses of neomycin as a serum cholesterol reducing agent has been investigated. Sixteen patients were given neomycin sulfate orally for periods varying from 12 to 40.1 months, following control periods of 2.6 to 14.6 months. After an initial daily dose of 2 g of neomycin, the daily dose was varied between 0.5 and 2 g according to response. Average total serum cholesterol concentrations decreased in each of the 16 patients by 15 to 32%; the average decrease for the group was 22%. The difference was statistically significant in each patient at the 0.1% level. Serum cholesterol concentrations were maintained at the lower plateau as long as the drug was given. In an additional patient, after administration of neomycin for 2 months there was no change in serum cholesterol concentrations and the study was discontinued. Another developed severe diarrhea, nausea and abdominal cramps during the first week of the study.

Aspects of liver lipid metabolism in the biotin-deficient rat. P. Puddu, P. Zanetti, E. Turchetto and M. Marchetti. (Istituto Chimica Biologica, Univ. di Bologna, Italy). *J. Nutr.* **91**, 509–13 (1967). The effect of biotin deficiency on some aspects of lipid metabolism in the liver of female and male rats was investigated. No significant difference was found either in total lipid content or in lipid composition in the liver of biotin-deficient rats of both sexes when compared with biotin-treated controls. Significant changes were observed in the percentage fatty acid composition, namely more 16:1 and 18:2 and less 18:0 fatty acid were found in total liver lipids of the biotin-deficient rats. The incorporation of ^{32}P into liver phospholipids in intact biotin-deficient rats was not altered. The rate of incorporation *in vitro* of acetate-1-^{14}C into total liver lipids was significantly decreased in biotin deficiency. These data appear to indicate that biotin deficiency in the rat may result in some changes in liver lipid metabolism.

The metabolism of phospholipids in mouse brain slices. P. A. Clayton and C. E. Rowe (Univ. of Birmingham, England). *Biochem. J.* **101**, 674–9 (1966). Slices of mouse brain grey matter were incubated with ^{32}P-phosphate and acetate-1-^{14}C. Doubly labelled phospholipids were extracted from subcellular fractions prepared from the slices in a mixture of metabolic inhibitors, under conditions where there was a negligible change in radioactive labelling during the preparation. Two tissue fractions were studied in detail; one contained a high proportion of mitochondria and the other was mainly microsomal. In all tissue fractions the highest incorporation of both ^{32}P-phosphate and acetate-1-^{14}C occurred into phosphatidylcholine. After incubation for 1 hr., the ^{32}P/^{14}C ratios for phosphatidylcholine, phosphatidylethanolamine and phosphatidic acid in the mitochondrial fraction were similar to those in the microsomal fraction. The ^{32}P/^{14}C ratios were similar in phosphatidylcholine and phosphatidylethanolamine and much lower than those in phosphatidic acid and phosphatidylinositol.

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• Detergents

THE HEAT OF SOLUTION AND OF WETTING OF IONIC SURFACTANTS CLOSE TO THE KRAFFT POINTS. K. Shinoda, S. Hiruta and K. Amaya (Dept. Chem., Fac. of Engineering, Yokohama National Univ., Minamiku, Yokohama, Japan). *J. Colloid Interface Sci.* 21, 107–122 (1966).

ASPECTS CONCERNING THE CONSTITUENTS OF UNSULFONATED PORTIONS OF HIGH MOLECULAR WEIGHT ALKYL BENZENE SULFONATES. A. Metzger (Kempen/Ndrh, Germany). *Tenside* 3, 381–6 (1966). Investigation of a number of infra-red spectra of unsulfonated portions of tetrapropylene benzene sulfonic acid suggests a dependency of both chemical composition and amount of these unsulfonated portions on the reaction temperature, time, type of sulfonating agent employed and source of the tetrapropylene benzene used. The results cast doubt on the theory that the unsulfonated portions, particularly the ketones, produced through oxidative reactions, could have been formed via intermediate hydroperoxides. The possibility is advanced of the ketones having been formed via olefins and secondary sulfates from secondary alcohols, through the dehydrogenating action of sulfuric acid.

THE STRUCTURE OF CONCENTRATED AQUEOUS SOAP SOLUTIONS. A. Skoulios (Cent. de Res. sur le Macromolecules, Strasbourg, France). *Advan. Colloid Interface Sci.* 1, 79–110 (1967). A review in French with 34 references.

LABORATORY METHOD OF MEASURING THE DRY SOILABILITY OF FABRICS. J. Berch, H. Peper, J. Ross and G. L. Drake, Jr. (Harris Res. Lab.). *Am. Dyestuff Rept.* 56, 27–31 (1967). A laboratory method is described for the dry soiling of textile materials, by which a wide variety of natural or synthetic soils, liquid or oily, can be applied to various textile materials to measure fabric soilability or to prepare soiled fabric for detergency studies. The method consists of first applying the soil to dense felt cubes and then soiling the test fabrics by tumbling with the soiled cubes at slow speeds. The degree of soiling can be controlled by modifying the amount of soil applied to the cubes, the soiling time, or the composition of the soil. The soil is applied with such a high degree of uniformity and reproducibility that statistically different levels of soilability can be measured even when differences in soiling are small.

PHOSPHATE CONVERSION IN DETERGENT SLURRIES. H. H. Weldes and N. R. Horikawa (Philadelphia Quartz Co.). *Soap Chem. Specialties* 43, 51–3, 99 (1967). Crystalline and liquid alkaline sodium silicates can be used to provide the alkali needed for the conversion of sodium trimetaphosphate to sodium tripolyphosphate. An excess of Na_2O over the stoichiometric amount necessary for the conversion must be used to prevent silica precipitation. Best results are obtained when the final SiO_2/Na_2O ratio has a value of 2–2.7. The degree of conversion is at least 99.5% and the reaction product shows no reversion on aging. The rate of conversion increases with higher alkalinity of the silicate and with increasing temperature. Conversion with meta and orthosilicate at room temperature is a self-starting exothermic reaction which is complete in 15 minutes. At higher temperatures, conversion can be complete in as little as 2–3 minutes. Silicates with SiO_2/Na_2O ratios greater than 1 do not react spontaneously at room temperature, however they convert completely within 10 minutes when heated to near the boiling point.

OLEFIN SULFONATES IN DETERGENTS. R. C. Odioso (Colgate-Palmolive Co.). *Soap Chem. Specialties* 43, 47–50, 92–3 (1967). Contrary to previous reports, olefin sulfonates have been found to have lower detergent power than LAS surfactants. However, tests conducted on pure C_{18} alkenyl sulfonates indicate that pure materials perform better than the commercial products which contain hydroxysulfonate and other by-products of sulfonation. An extensive summary is given of previously published information on olefin sulfonates.

USE OF MODERN HOME LAUNDRY EQUIPMENT. R. K. Taube and N. D. Poole (U.S. Dept. of Agric.). *Am. Dyestuff Rept.* 56, 32–4 (1967). Swatches of white fabrics made from various fibers were washed together through nine launderings according to procedures typical of those used in the home. Type of washer, weight of load, wash and rinse water temperatures, speed of agitation, length of wash, speed of spinning, and various aspects of the drying procedure were investigated in relation to color and dimensional changes of the fabrics.

SYNTHESIS AND PROPERTIES OF SILOXANE-POLYETHER COPOLYMER SURFACTANTS. B. Kanner, W. G. Reid and I. H. Petersen (Silicones Div., Union Carbide Corp., Tonawanda, N. Y.). *Ind. Eng. Chem. Prod. Res. Dev.* 6, 88–92 (1967). Properties of a series of methylsilozane-oxyalkylene copolymers are compared with typical hydrocarbon surface active agents. The siloxane surfactants were characterized by surface tensions as low as 20 to 21 dynes per cm. in aqueous solution and relatively small micelles (aggregation numbers of 3.4 and 4.7). As a result of low aqueous surface tensions, certain of these copolymers were excellent wetting agents for low energy hydrophobic surfaces such as polyethylene. Unlike hydrocarbon derivatives, methylsiloxane-polyether copolymers were also surface active in non-aqueous polypropylene glycol systems, a contributing factor in the stabilitation of polyurethane foam.

STUDIES ON SEVERAL α-ALKYL α′-HYDROXYETHYL AND -HYDROXYPROPYL GLYCERYL DIETHERS. Shoichiro Watanabe, Masaru Saito and Toshiko Sinozima (Kitasato Univ., Tokyo). *Yukagku* 16, 197–202 (1967). Hydroxyethyl or hydroxypropyl chlorohydrin ethers were obtained by the addition of epichlorohydrin to ethylene glycol or propylene glycol in the presence of stannic chloride (yield 95%). From these ethers and potassium alcoholates, the diethers with two hydroxy groups or α-alkyl α′-hydroxyethyl (propyl) glyceryl diethers (alkyl = octyl, 2-ethylhexyl, decyl, dodecyl, tetradecyl, hexadecyl and 2-hexyldecyl) were obtained, and their purities were confirmed by elementary analysis, IR analysis and OH values. Surface tension, dispersing and emulsifying powers of these compounds are given.

EFFECTS OF UNSATURATED GROUP ON THE SURFACE ACTIVITIES OF HIGHER FATTY ALCOHOL SULFATES. Atsuo Kobashi (First Tech. Research and Development Centre, Tokyo). *Yukagaku* 16, 194–6 (1967). The effects on surface activities by mixing of sodium stearyl and oleyl sulfates were examined. The solubility of stearyl sulfate in water was increased by mixing with oleyl sulfate. The mixture showed double kraft points and their position shifted with an increase in the amount of oleyl sulfate. There was not much difference between the surface tension of each solution in relatively high concentrations, but it became higher in dilute solution (below 0.03%) with an increase of oleyl sulfate. There was not much difference in CMC value of both sulfates by conductivity or surface tension methods. Carbon dispersing power of 0.05% concentration of each was the same but at 0.1% concentration the mixture showed higher power than that of either single solution.

SO_3 SULFONATION PROCESS FOR MANUFACTURING OF SYNTHETIC DETERGENTS. Rinosuke Suzuki, Kaname Abe and Toshiaki Ogushi (Lion Fat & Oil Co., Tokyo). *Yukagaku* 16, 311–5 (1967). A review with 28 references.

THE CONSTITUTION AND PROPERTIES OF SURFACE ACTIVE SUBSTANCES. V. THE EFFCT OF THE POSITION OF THE QUATERNARY CARBON ATOM ON THE BIODEGRADABILITY OF ALKYL BENZENE SULFONATES. H. Kölbel, P. Kurzendorfer and C. Werner (Tech. Univ. of Berlin, Berlin, Germany). *Tenside* 4, 33–40 (1967). The aerobic biodegradability of pure, uniform model compounds, namely sodium p-alkyl benzene sulfonates with a straight alkyl chain and with a quaternary carbon atom in the 1-position to the benzene ring or at the end of the alkyl chain has been studied. Surfactant degradation was tested using a dilute, non-adapted biological system of Coli bacteria and a culture of mixed bacteria respectively, by determining the methylene blue activity and the biochemical oxygen demand as well as by simultaneous production of UV spectra.

THE DETERMINATION OF SOAP IN DETERGENTS. E. Heinerth (Henkel & Cie G.m.b.h., Dusseldorf, Germany). *Tenside* 4, 45–7 (1967). Some analytical problems in the analysis of soap in synthetic detergents are discussed. Ion exchange methods alone allow an exact determination of soap in admixture with surface active compounds. For more rapid analysis the fatty acids can be separated by acidification or the soap can be isolated by treating the dried, ground surface active compounds with acetone; however, neither one of these methods applies generally.

DETERMINATION OF BIODEGRADABILITY OF NONIONIC SURFACTANTS BY SULFATION AND METHYLENE BLUE EXTRACTION. K. W. Han (Unilever Res. Lab., Vlaardingen, Netherlands). *Tenside* 4, 43–5 (1967). An analytical method is described for the determination of small concentrations of nonionic surfactants of the polyethylene glycol type. The polyethoxylates are extracted from the aqueous solution with pure chloroform and sodium chloride, the extract is sulfated and neutralized, and the ether sulfates formed are determined according to a modified Longwell-Maniece method. The method has been applied to follow the biodegradation of a number of commercial nonionics using a semi-continuous aeration method.

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with dimethyl sulfoxide and sodium bicarbonate. In studying the Rosenmund reduction of acid chlorides to aldehydes, White, Sulya and Cain [J. Lipid Res. *8*, 158 (1966)] found that while this method worked well for the preparation of saturated aldehydes, the reduction of oleoyl chloride gave stearaldehyde as well as olealdehyde. Moreover, the olealdehyde contained 26% *trans* bonds and the double bonds were scattered from C_6 through C_{14} with less than half remaining at C_9.

Since a noncatalytic method might give reduction without bond migration or isomerization, the reduction of unsaturated acid chlorides with lithium tri-*t*-butoxyaluminohydride [J. Am. Chem. Soc. *80*, 5377 (1958)] was studied. Infrared analyses of olealdehyde, linolealdehyde and stearolaldehyde prepared from the corresponding acid chlorides revealed no *trans* isomers. Ozonization-reduction of the ethylenic aldehydes or ozonization-hydrolysis-esterification of the acetylenic aldehyde followed by gas-liquid chromatographic analysis of the fragments showed that essentially no bond migration had occurred (at most 3–5%). Ultraviolet analysis of linolealdehyde showed the absence of conjugation. Therefore, lithium tri-*t*-butoxyaluminohydride can be used to reduce monoethylenic, diethylenic and monoacetylenic acid chlorides to the corresponding aldehydes with essentially no bond migration or isomerization.

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Flavor Chemists Elect Merwin President

E. L. Merwin has been elected to a one-year term as President of the Society of Flavor Chemists, Inc., at its Annual Meeting in New York City.

Other officers elected were: Vice President, Anthony Clemente of Fritsche Bros.; Secretary, Eugene Buday of Polak Frutal Works; Treasurer, A. V. Saldarini of Norda.

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Applications Now Being Accepted for Polymeric Materials Program

Applications for the graduate program in Polymer Chemistry and Technology at Polytechnic Institute of Brooklyn are now being accepted by the Office of Admissions, 333 Jay St., Brooklyn, N. Y. 11201.

Registration will be held Sept. 18–21, 1967. Classes begin Sept. 25. Research fellowships are available for the program, announced Prof. James Conti, Head of the Chemical Engineering Department. Interested students may write to Prof. Conti or call him at (212)643–2852 or 643–2962.

The program, leading to a master's degree in Polymeric Materials, can be pursued full-time in the day or part-time in the evening. A full-time student can complete the program in one calendar year.

Requirements for the program are a B.S. degree in Chemistry or Chemical Engineering or the equivalent from an approved college. Total semester hour credits required for the degree are 30. Of this total, 20 are elective credits.

Planned to make possible specialization in polymer science or engineering or to obtain a diversified training in both *polymer chemistry and technology,* the program conforms fully with the recommendations of the Education Committee of the Society of Plastics Engineers.

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Synergistic sequestering agent. J. S. Pierce. *U.S. 3,294,689.* A synergistic sequestering composition of matter of wide utility is claimed which, when dissolved in water, consists essentially of an aqueous solution of $(HOCH_2)_3CNHCH_2CHOHCH_2NHC(CH_2OH)_3$ and citric acid, in which the molar ratio of polyhydroxyamine to citric acid has limits of 4/1 to 1/4.

Shaving cream containing polysiloxanes. J. L. Bishop, Jr. and C. W. Todd (Dow Corning Corp.). *U.S. 3,298,919.* A shaving cream composition consists of 0.5-9% stearic acid, 0.5-3% lauric acid, 1-15% glycerine, 1-7% triethanolamine, 40-80% water, 2-12% of a propellant and 0.1-5% of a silicone fluid.

Lime soap dispersants. R. R. Irani and K. Moedritzer (Monsanto Co.). *U.S. 3,298,956.* A soap composition is claimed, consisting essentially of soap and at least one per cent by weight of an organo-amino polymethylphosphonic compound of the formula $(R_1)(R_2)N—C(Y)(Y')—PO(OX)_2$, where X is a cation selected from the group consisting of hydrogen, alkali metal ion, ammonium ion and lower molecular weight alkyl, alkylene and alkanol amine ions; Y and Y′ are either hydrogen or lower alkyl groups containing 1-4 atoms; R_1 is either hydrogen, an aliphatic group containing 1 to 30 C atoms or $—C(Y)(Y')—PO(OX)_2$; R_2 is selected from the class consisting of hydrogen, aliphatic groups containing 1 to 30 C atoms, $—C(Y)(Y')—PO(OX)_2$ and $—[C(Y)(Y')]_n—N(Z')(Z)$, where n is an integer from 1 to 30; Z is a member selected from the class consisting of hydrogen and $—C(Y)(Y')—PO(OX)_2$ and Z′ is a member selected from the class consisting of hydrogen, $—C(Y)(Y')—PO(OX_2)$ and $—[C(Y)(Y')NZ]_m—C(Y)(Y')—PO(OX)_2$, where m is an integer from 1 to 30; with at least one of the groups represented by R_1 and R_2 containing at least one $—C(Y)(Y')—PO(OX)_2$ group.

Detergent breaker composition. J. S. Frank. *U.S. 3,298,963.* A synthetic detergent breaker composition consists essentially of 2-60% by wt. dialkylpolysiloxane having the general formula $(RSiO)_n$ where n is a positive integer from 2 to 100 and the R radicals are alkyl groups with, at the chain ends, from 1 to 6 C atoms; 2-70% alkylsiloxymetallic complex having the general formula $(RSiO)_3M$, where M is the metallic ion selected from the group consisting of Al, Fe^{2+}, Fe^{3+} and Co and the R consists of alkyl groups from C_1 to C_6; 10-70% metallic sulfate, the metal being Al, Fe^{2+}, Fe^{3+} or Co.; 0.5-20% silica gel; and 0.2-0.5% of a pH controlling material selected from the group consisting of sulfuric acid, sulfurous acid and ascorbic acid.

Alkylene oxide polymer composition flexibilized with salts of carboxylic acids. R. D. Lundberg and R. W. Callard (Union Carbide Corp.). *U.S. 3,298,980.* An homogeneous composition is claimed, comprising a polyethylene oxide having a reduced viscosity of at least 1 and from about 20 to 40% by wt., based on the weight of the polymer, of a salt containing 4-22 C atoms selected from the group consisting of ammonium or alkali metal salts of aliphatic carboxylic acids or aromatic carboxylic acids.

Method of selecting emulsions intended for the preparation of cosmetics and skin products. R. R. Aron-Brunetiere and C. F. Aron (Paris, France). *U.S. 3,300,386.* A method is described for testing emulsions as to their suitability in the treatment of dry and greasy skins. The method involves effecting a biopsy of an untreated portion of the shaven skin of an animal, applying the emulsion to be tested on another portion of the shaven skin at spaced intervals for a predetermined interval and effecting biopsies of the treated portion to determine the effect of the treatment. Emulsions for treating dry skins are expected to cause hyperplasia of the sebaceous glands and emulsions for treating greasy skins should fail to cause such an effect.

Pressed powder antiperspirant and method of preparation. R. L. Kole (Kolmar Laboratories, Inc.). *U.S. 3,300,387.* A topically applied product for human use consists of a dry pressed powder cosmetic base having dispersed in itself divided particles of a hygroscopic antiperspirant coated with a water-soluble wax-like material selected from one of the following: polyethylene glycols with an average molecular weight of 1000 to 6000; polypropylene glycols with an average molecular weight of 140 to 600; methoxy propylene glycols with an average molecular weight of 350 to 750; lanolin extracts; ethoxylated lanolin; fatty acid esters of polyalcohols containing C_8 to C_{20} fatty acids; ethoxylated fatty acids containing

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The feature beginning on page 298A of this issue, "Air Pollution Regulation of Nonvehicular, Organic-Solvent Emissions by Los Angeles Rule 66," by G. R. Maher, is a continuation of the series in publication from the AOCS Fats and Oils Processing Short Course held in East Lansing, Aug. 29–Sept. 1, 1966. Additional papers will appear in subsequent issues of the Journal.

• *New Products*

Supelco, Inc., Bellefonte, Pa. has a new dimethylpolysiloxane stationary phase OV-1 for gas chromatography, designed for use at exceptionally high temperatures. It can be substituted for the commonly used nonpolar silicones without the need for recalibration since separation characteristics are identical.

Varian Aerograph, Walnut Creek, Calif., has announced its new preparative gas chromatograph, Model 713, with a time pressure injector that allows automatic, reproducible introduction of a wide range of sample sizes up to 30 ml.

Also available from the company is a fully-automated gas chromatography integrator, Model 475, which can be used with all gas chromatography detectors. The compact, all-transistor model accepts an input signal range from 0 to 1400 mv and permits accuracy of better than 0.1%.

Fisher Scientific Co., Pittsburgh Pa., has developed a new version of their potentiometric titralyzer. Called the photometric titralyzer, it fully automates routine colorimetric analysis, using optical-electronic detection of endpoints. It presents answers on paper tape; recycles itself to its initial condition; indexes the next sample into position; and proceeds with the next analysis. Capacity: 15 samples.

Stepan Chemical Company, Northfield, Ill., has begun commercial production of alpha olefin sulfonates under the name Bio-Terge. They are said to offer complete and rapid biodegradability. Stevens says their nonhygroscopic surfactants offer good solubility and stability for hard water, acids, alkalis and heat, and are more compatible with soap than linear alkyl sulfonates.

Supelco, Inc., Bellefonte, Pa., now has available 1,2 dimyristin, 1,2 dipalmitin, and 1,2 diolein. Each is offered as a 99% pure isomer and should be of value as calibration standards for those working with natural products or studying animal metabolism.

Pharmacia Fine Chemicals, Inc., Piscataway, N.J., has a new Sephadex laboratory column K 50 for analytical and preparative, as well as semi-industrial scale applications in gel filtration and ion exchange chromatography. Adjustable flow adaptors and a cooling jacket allow the column to be operated with aqueous systems at a constant temperature as part of an automatic or semiautomatic system.

Brinkmann Instruments, Westbury, N.Y., has announced a new line of homogenizers (dispersers, emulsifiers) for inducing physical or chemical change on samples with a kinematic high-frequency sonic and/or ultrasonic system. The latest version of Ultra Turrax homogenizers, they are most effective with highly concentrated samples.

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• *Obituaries*

Frank Woodson (1928), member emeritus of AOCS, died April 12 in Memphis, Tenn.

C. F. Raschke (1940), Manager, Brookside Division, Safeway Stores, Inc., Oakland, Calif., died June 27, 1967.

Word has been received of the death in June of Mrs. J. R. Mays, wife of J. R. Mays (1916) retired president of Barrow-Agee Labs, Inc.

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C_8 to C_{20} fatty acids; and ethoxylated fatty alcohols containing C_8 to C_{20} fatty alcohols.

Surface active compositions containing mixtures of mono- and di-alkyloxy-methyl ethers of sugar. G. R. Ames (U.S. Sec'y of Agr.). *U.S. 3,300,413.* A surface active composition is claimed, consisting essentially of about equal parts by weight of: (I) a mono-(alkyloxymethyl) ether of a sugar and (II) a di-(alkyloxymethyl) ether of a sugar. The sugar in both I and II is either glucose or sucrose and the alkyl groups contain 6 to 12 C atoms.

Process for the sulfonation of peroxidized, deperoxidized unsaturated fatty acid esters and product. J. Plapper and H. J. Krause (Bohme Fettchemie G.m.b.H., Dusseldorf, Germany). *U.S. 3,300,525.* A process for the production of sulfonated fatting agents from unsaturated, hydroxy-free fatty materials, such as either natural or synthetic fats and oils, comprises the steps of: (a) peroxidizing the fatty materials by treatment with oxygen containing gases at 65–100C; (b) deperoxidizing by heat treatment at 110–160C; (c) sulfonating by reaction with 5 to 15% of sulfur trioxide at 0–20C; (d) bleaching the sulfonated products with hydrogen peroxide, and (e) neutralizing the bleached, sulfonated product.

Water soluble esters of hydroxyl-containing, micelle forming surface active compounds. F. E. Woodward and R. A. Grifo (General Aniline & Film Corp.). *U.S. 3,301,829.* A composition is claimed comprising a water-soluble partial ester of: (1) an hydroxyl-containing micelle-forming surface active agent selected from the group consisting of anionic surfactants, alkylene oxide condensation products, alkylolamine condensation products with fatty acids or with fatty esters, and glycol and polyesters of fatty acids, and (2) an alkali-soluble interpolymer of an ethylenically unsaturated carboxylic acid anhydride with a terminal unsaturated monomer selected from the group consisting of vinyl ethers, vinyl esters and alpha olefins; the said partial ester containing not more than about 5% of the carboxyl groups present as ester groups.

Detergent processes and compositions therefor. C. Y. Shen and J. S. Metcalf (Monsanto Co.). *U.S. 3,303,134.* A process for manufacturing a heat-dried composition containing hydrated penta alkali metal tripolyphosphate comprises the steps of preparing an aqueous slurry containing at least about 10% by wt., based on the total slurry weight, of water, at least about 5%, based on the total slurry weight, of an alkali metal trimetaphosphate, and an alkali metal base. The alkali metal base should have a pH of at least 10.2 at 25C at a 1% by wt. concentration in water and should be present in the aqueous detergent slurry in an amount sufficient to convert at least one third of the alkali metal trimetaphosphate to hydrated penta alkali metal tripolyphosphate. Lastly, the aqueous detergent slurry is heat-dried.

Method of preparing cleansing compositions. S. Goldwasser (Lever Bros. Co.). *U.S. 3,303,135.* An improvement is claimed in the preparation of a heat-dried nonionic detergent composition consisting essentially of (a) at least one nonionic surface active agent having detergent properties, (b) a phosphate builder such as an alkali metal pyrophosphate or tripolyphosphate, (c) sodium carboxymethylcellulose and (d) sodium silicate in an amount effective to inhibit corrosion. The composition is prepared by blending the ingredients with water to prepare a slurry and subsequently heat-drying the resultant slurry. The improvement consists in combining the carboxymethylcellulose, water and sodium silicate with alpha; beta-di-5-methyl-benzoxazoyl-(2)-ethylene as a brightening agent, and agitating the mixture for at least three minutes to affix the brightening agent to the carboxymethylcellulose, the amount of carboxymethylcellulose being sufficient to adsorb the brightening dye and to maintain it in an active state. The other ingredients are then added and the resultant slurry is heat-dried.

Detergent compositions. W. M. Bright (Lever Bros. Co.). *U.S. 3,303,136.* A detergent composition is claimed, consisting essentially of about 40–85% of a condensed, inorganic polyphosphate and of about 15–60% of a water-soluble arylsulfonate selected from the group consisting of benzenesulfonate, *o*-xylene sulfonate, *m*-xylenesulfonate, *p*-xylenesulfonate, toluene sulfonate, ethylbenzenesulfonate, *n*-propylbenzenesulfonate, isopropylbenzenesulfonate and mixtures thereof, the composition providing an alkaline reaction in aqueous solution.

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