ABSTRACTS

R. A. REINERS, Elitor. 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

DETERIORATION DURING LOW TEMPERATURE STORAGE OF CONFECTIONER'S FAT CONSISTING OF COCONUT OIL. Masao Imamura, Isao Niiya, Kazuke Takagi and Taro Matsumoto. *Yukagaku* 16, 13–17 (1967). Storage of commercial shortening containing cocount oil for 12 months at −20, 5 and 30C showed that those stored at 5C developed a peculiar rancid odor after 2 months and increased in acid value. The degree of rancidity increased with increased coconut oil content and with increased degree of hydrogenation. There was no change in samples stored at −20C and 30C. There was no change in peroxide value but the carbonyl value of the sample stored at 30C increased. The acidity of the steam-distillate from the sample stored at 30C showed no change from original sample but that stored at 5C was distinctly higher.

ANTARCTIC WHALE OILS BY GAS-LIQUID CHROMATOGRAPHY USING HYDROGEN FLAME IONIZATION DETECTOR. VI. 2,6,10,14-TETRAMETHYLPENTADECANOIC ACID IN WHALE OIL. Yoshihiko Sano (Miyoshi Oil & Fat Co., Tokyo). *Yukagaku* 16, 8–12 (1967). Whale blubber oil contained around 0.05% (fatty acid basis) of this multibranched fatty acid. It was found to be identical with synthesized 2,6,10,14-tetramethylpentadecanoic acid by infrared absorption, high resolution nuclear magnetic resonance, and mass spectrometry.

THE PRACTICE OF DEEP FAT FRYING. C. J. Robertson (Bakery, Restaurant and Institutional Div., Procter & Gamble Company, New York). *Food Technol.* 21(1), 34–6 (1967). Although modern day kettle design is far improved over what it was a generation ago, there is still much work to be done by both fat and equipment manufacturers to approach the ideal situation where the fat in the frying kettle will remain in service in as good a condition as when it is first put into service.

FATTY ACIDS IN ELEVEN SPECIES OF BLUE-GREEN ALGAE: GEOCHEMICAL SIGNIFICANCE. P. L. Parker, C. Van Baalen, and L. Maurer (Inst. of Marine Sci., Univ. of Texas, Port Aransas). *Science* 155, 707–8 (1967). Analyses of the total lipids of 11 species of blue-green algae showed a simple but qualitatively variable fatty acid composition. The species can be grouped in three categories on the basis of their oleic, linoleic and linolenic acid content. One species was unusual in that the ten-carbon acid accounts for one-half of its total fatty acid. Branched chain acids are absent in the algae, but are major components of marine bacteria. The geochemical significance of the data is discussed.

QUANTITY AND FATTY ACID COMPOSITION OF LIPID SYNTHESIZED BY STREPTOCOCCUS AGALACTIAE AND STREPTOCOCCUS UBERIS. Patricia Macleod and A. Miller, III (Dept. of Animal Industries, Univ. of Conn., Storrs). *J. Dairy Sci.* 50, 155–9 (1967). Evidence is presented that the lipid synthesized by recently isolated strains of *Streptococcus agalactiae* and *Streptococcus uberis* contained higher percentages of 16- and 18-carbon monoenoic acid(s) than that synthesized by strains from the stock culture collection. The strains of *S. agalactiae* did not synthesize appreciable quantities of lactobacillic acid, whereas the strains of *S. uberis* resembled the lactic streptococci in this respect.

GAS-LIQUID CHROMATOGRAPHIC ANALYSIS OF MILK FATTY ACIDS: A REVIEW. R. G. Jensen, D. L. Carpenter and J. Sampugna (Dept. of Animal Indust., Univ. of Connecticut, Storrs). *J. Dairy Sci.* 50, 119–26 (1967). Application of gas-liquid chromatography (GLC) to the analysis of milk fatty acids has allowed the rapid separation and identification of these acids. To date, at least 142 acids have been reported, though many are present only in trace amounts. Saturated, unsaturated (*cis* and *trans*), branched-chain, hydroxy, and keto acids, as well as a cyclic acid, have been discovered. Techniques employed to extract fat from milk, convert the fatty acids to esters suitable for GLC analysis, and transfer the esters to the instrument quantitatively are described. Some of the problems involved in GLC analysis of milk fatty acids are discussed.

QUALITY CONTROL OF COMMERCIAL DEEP FAT FRYING. G. A. Jacobson (Basic Res. Dept., Campbell Inst. for Food Res., Camden, N. J.). *Food Technol.* 21(2), 43–8 (1967). The quality of fried foods can be affected by frying conditions, including the nature of the installation and the medium used for frying, and by cleaning of equipment. Laboratory tests are available or have been devised to provide a measure of control over the deep fat frying process. One test described gives an estimate of the resistance of a fat to high-temperature oxidation. Typical shortenings vary widely in their performance in this test. Means are available to measure changes occurring in the frying fat during operation of a continuous fryer, i.e., changes in free fatty acids, color, refractive index, iodine value, and viscosity. Several frying fats that contained appreciable amounts of non-urea-adduct forming material also received poor flavor scores. A modified TBA test was useful in assessing the flavor of unused frying fat, of used frying fat, and could also be used to follow flavor deterioration in such fried products as potato chips and nuts.

γ-RADIOLYSIS OF OLEIC ACID. D. R. Howton and Guey-Shuang Wu (Lab. of Nuclear Med. and Radiation Biol., Dept. of Biophys. and Nuclear Med., Univ. Calif. at Los Angeles School of Med.). *J. Am. Chem. Soc.* 89, 516–25 (1967). Exposure of oleic acid in the absence of air to ^{60}Co γ rays (in agreement with findings in earlier investigations involving other types of ionizing radiation) results in polymerization, *cis-trans* isomerization, decarboxylation and hydrogenation, in order of decreasing extensiveness. Hydrocarbons resulting from decarboxylation are primarily of chain length C17; others of higher molecular weight are believed to be derived from dimers by secondary reaction. Contrary to conclusions reached in earlier work, the major hydrocarbon is *cis*-8-heptadecene, the "straightforward" decarboxylation product of oleic acid. Decarboxylation, which occurs independently of concurrent events (hydrogenation and isomerization) affecting the center of unsaturation, is believed to be initiated by loss of an electron from the carboxyl group, followed by events in which the hydrogen-bonded association dimers of the acid play an important role. Dimers, apparently largely doubly unsaturated and cross-linked at carbon atoms adjacent to the double bonds, are believed to arise largely via coupling of allylic radicals produced both by hydrogen-atom abstraction and by C—H bond homolysis.

CHARACTERIZATION OF SOME C_{15} CONSTITUENTS OF HOP OIL. R. G. Buttery, R. E. Lundin and Louisa King (West. Reg. Res. Lab., USDA, Albany, Calif.). *J. Agr. Food Chem.* 15, 58–65 (1967). A number of C_{15} components of hop oil have been isolated by conventional and capillary gas-liquid chromatography separation and characterized using infrared absorption, nuclear magnetic resonance, and mass spectrometry, combined in some cases with data from ozonolysis and other chemical methods. Beside the previously reported hop sesquiterpene hydrocarbons—humulene, caryophyllene, farnesene, and β-selinene—evidence was found for the presence of copaene, α-selinene, and δ-cadinene and the probable identities of more as γ-cadinene, selina-4(14), 7(11)-diene, and selina-3,7(11)-diene. A number of oxygenated sesquiterpenoids were detected. The major ones were identified from their infrared spectra as humulene epoxide II and humulenol. Evidence for the probable identities of C_{15} di- and tri-unsaturated straight chain ketones and pentadeca-6,9-dien-2-one and pentadeca-6,9,13-trien-2-one was discovered also.

CATALYTIC HYDROGENATION. II. A NEW, CONVENIENT TECHNIQUE FOR LABORATORY HYDROGENATIONS. A SIMPLE, AUTOMATIC DEVICE FOR ATMOSPHERIC PRESSURE HYDROGENATIONS. C. A. Brown and H. C. Brown (Purdue Univ., Lafayette, Indiana). *J. Organic Chem.* 31, 3989–95 (1966). The rapid, *in situ* preparation of highly active hydrogenation catalysts by the reduction of platinum metal salts with sodium borohydride has been combined with a convenient automatic hydrogen generator based on sodium borohydride to provide a new highly convenient procedure for laboratory-scale hydrogenations. The utility of the new platinum-on-carbon catalyst, and the applicability of the new hydrogenation technique have been explored over a wide range of representative hydrogenation problems. It is concluded that the new technique possesses a number of significant advantages for laboratory-scale hydrogenations.

METHOD FOR PROTECTING LIPIDS AGAINST OXIDATION. P. A. Pottier. *U.S. 3,294,825.* A method for protecting lipids containing unsaturated constituents against oxidation consists of distributing in the volume of the lipid to be protected a mixture consisting of ascorbic acid, citric acid and a carrier selected from the group consisting of stearic acid, palmitic acid, lauric acid, linoleic acid and esters formed by said acids and a polyhydric alcohol selected from the group consisting of glycerol, ethylene glycol, propylene glycol, diethylene glycol, triethylene glycol and polyoxyethylene glycol. The amounts of citric and ascorbic acid are each between 1 and 18% of the total weight of the mixture, which must be added to the lipid in amounts in excess of 0.03% of the weight of the lipid to be protected.

PROCESS FOR ACID HYDROLYSIS OF WASTE ANIMAL MATERIAL AND PRODUCT. J. F. O'Neill. *U.S. 3,294,826.* A method is claimed for forming tallow from animal by-products which comprises heating the ground animal by-product to a temperature in the range 190–235F in admixture with an aqueous solution containing a major amount of phosphoric acid and a minor amount of alkali carbonate, until the animal by-product hydrolyzes to tallow, thereafter maintaining a temperature in the range of 150 to 180F. Hydrolyzed tallow having a moisture content of less than 1% is continuously withdrawn during the operation, while additional ground animal by-product and additional amounts of the hydrolyzing solution are continuously added to the conversion mass.

METHOD OF PELLETIZING AND EXTRACTING OILS FROM OLEAGINOUS COMMINUTED MATTER. D. Hale, G. T. Lanz and H. T. James (Ralston Purina Co.). *U.S. 3,297,731.* A method is described for extracting the fat content of comminuted fish particles which comprises moistening the comminuted particles with steam until their moisture content is approximately 14%, pelletizing the moistened particles to form pellets, heating the pellets and then cooling and drying them to a moisture content of about 9–11%, spraying hexane at a temperature of about 130F onto the pellets, then separating the hexane and the pellets and heating the pellets so separated to a temperature of about 180F.

• Fatty Acid Derivatives

INTERNAL ANTISTATIC TREATMENT OF POLYETHYLENE WITH METAL SALTS OF AMPHOTERIC SURFACE ACTIVE AGENTS. Hideo Marumo, Minoru Saito, Morio Ninomiya and Shinro Watanabe (Lion Fat & Oil Co., Tokyo). *Yukagaku* 16, 30–5 (1967). Compounds of the type $[RN(CH_2CH_2O)_pH\ (CH_2CH_2O)_qH\text{-}CH_2COOM]^+\ OH'$ were examined where M is Mg, Ca, Ba or Zn, $R = C_{12}H_{25}$ or $C_{18}H_{37}$ and $p + q = 2$ or 4. Examples of new type amphoteric surface active agent were incorporated into polyethylene by extruding or other molding method and the properties of these metal salts as internal antistatic agent were examined. These metal salts showed no bleeding out on the surface of incorporated sheet and films and exhibited excellent antistatic property as an internal antistatic agent for low and high density polyethylene. The antistatic properties of sheet and films were decreased by washing but soon recovered.

UNBAKED BAKERY PRODUCTS FOR REFRIGERATED STORAGE COATED WITH ACETYLATED MONOGLYCERIDES. S. A. Matz, R. E. Duncan and D. E. Mook (The Borden Co.). *U.S. 3,293,043.* A method of making a packaged unbaked bakery product for refrigerated storage and subsequent baking comprises the steps of temporarily hardening a baking adjunct into the shape desired, completely coating the adjunct with an acetylated monoglyceride, and placing the coated adjunct into a container in contact with a shaped piece of unbaked bakery food.

MANUFACTURE OF SUCCINYL MONOGLYCERIDE. E. H. Freund (National Dairy Products Corp.). *U.S. 3,293,272.* A method for preparing a half ester of succinic acid and a mono-acylated polyhydric alcohol comprises reacting succinic anhydride with a mono-acylated polyhydric alcohol having an acyl residue of a straight chain, saturated fatty acid with 14 to 24 C atoms and a polyhydric alcohol residue having a straight carbon chain of 2 to 6 C atoms. The reaction is carried out under heterogeneous phase conditions at a temperature below the melting point of the succinic anhydride and above the melting point of the mono-acylated polyhydric alcohol.

PROCESS FOR THE PRODUCTION OF UNSATURATED ALDEHYDES AND ACIDS. D. L. Flint and W. D. Schaeffer (Union Oil Co. of Calif.). *U.S. 3,293,290.* A process is claimed for the manufacture of unsaturated aldehydes and acids from a hydrocarbon having 3 to 8 C atoms, the hydrocarbon being either a monoolefin or a paraffin. The method consists in contacting a gaseous mixture of the hydrocarbon and oxygen with a catalyst such as phosphomolybdic acid, its iron and bismuth salts and mixtures thereof. The reaction is carried out at 300 to 600C in the presence of from several parts per million to about 1.0% by volume of the gaseous mixture of a promoter selected from the class consisting of hydrogen bromide and hydrogen iodide.

HYDROGENATION PROCESS FOR THE PREPARATION OF PRIMARY AMINES. D. Szabo (Emery Industries, Inc.). *U.S. 3,293,298.* A process for preparing fatty amines containing from 8 to 22 C atoms comprises hydrogenating the corresponding nitrile in the presence of a nickel hydrogenation catalyst and 1–10% by weight of the nitrile of an alumina-containing, polar adsorbent, the reaction being conducted at a temperature not substantially in excess of 150C.

PROCESS FOR PREPARING HYDROXYMETHYL-PHOSPHINE OXIDES. I. C. Popoff and J. Ping King (Pennsalt Chemicals Corp.). *U.S. 3,293,302.* A process is described for preparing hydroxymethylphosphine oxide having the structure $HOCH_2-P(O)R_1R_2$, where R_1 and R_2 are hydrocarbon groups selected from the class consisting of alkyl and aryl groups containing from one to ten C atoms. The process consists of fusing a chloromethylphosphine oxide of structure: $R_1R_2P(O)CH_2Cl$ with an alkali metal acetate and hydrolyzing the fusion mass.

WATER DISPERSIBLE CONDENSATION PRODUCTS OF A DRYING OIL GLYCERIDE ESTER AND A POLYETHYLENE GLYCOL. H. M. Schroeder and J. A. Pawlak (Textron, Inc.). *U.S. 3,297,605.* A liquid, water-dispersible composition, having a viscosity of up to 100 poises is claimed. The composition is the condensate of a mixture of 75–90% of a drying oil glyceride ester and 10–25% of a polyethylene glycol with a molecular weight of 400 to 2000. The glyceride ester can be either a heat-polymerized glyceride ester of an unsaturated C_{18} fatty acid or the same ester modified with 5–20% of a member selected from the group consisting of (1) a polyhydric alkanol of 3 to 6 C atoms and having 3 to 6 hydroxyl groups and a dicarboxylic acid of 4 to 8 C atoms, the alkanol and the acid being present in a ratio of 1:3, and (2) diolefins of 4 to 8 C atoms.

POLYAMIDES OF POLYMERIC FAT ACIDS. E. M. Fischer and F. M. Linn (General Mills). *U.S. 3,297,730.* A polyamide resin is claimed which is produced from a clay polymerized and hydrogenated monocarboxylic aliphatic acid with an alkyl chain of 8 to 24 C atoms and a photometric color not less than 90% and from a polyamine having the formula $H_2NR(NHR)_x\text{-}NH_2$, where R is selected from the group consisting of aliphatic and aromatic hydrocarbon radicals and x is an integer from 0 to 6.

• Biochemistry and Nutrition

TRANSPHOSPHATIDYLATION BY PHOSPHOLIPASE D. S. F. Yang, Sofia Freer and A. A. Benson (Dept. of Marine Biology, Scripps Inst. of Oceanography, Univ. of Calif., San Diego, La Jolla, Calif.). *J. Biol. Chem.* 242, 477–84 (1967). Transphosphatidylase activity was recognized in several plant tissues as well as in extracts. It was attributed to phospholipase D. This enzyme was purified 110-fold from Savoy cabbage. The ratio of its hydrolase to its transphosphatidylase activity remained constant throughout the purification. Additional evidence supports the conclusion that both reactions are catalyzed by the same enzyme. Phosphatidylations of ethanol, ethanolamine, and glycerol were readily achieved by incubating phosphatidylcholine and the enzyme in the presence of one of these acceptors. Concentrations of the acceptors required for equality between rates of hydrolysis and transphosphatidylation were 0.7, 0.3, and 1.1%, respectively, for ethanol, ethanolamine and glycerol. The glycerol configuration in the phosphatidylglycerol thus produced was DL-; phosphatidylation in this case was not stereospecific. Phospholipase D catalyzed exchange between choline and phosphatidylcholine. Its activity was completely inhibited in 10^{-4} M *p*-chloromercuribenzoate. The results implicate formation of a phosphothioester linkage in the phosphatidyl-enzyme complex.

Distribution of radioactivity in body fat and organs of rats treated with labeled Quinestrol, Ethynylestradiol or 17 β-Estradiol. B. G. Steinetz, A. Meli, T. Giannina, V. L. Beach and J. P. Manning (Dept. of Physiol., Warner-Lambert Res. Inst., Morris Plains, N.J.). *Proc. Soc. Exp. Biol. Med.* 124, 111–17 (1967). The distribution of radioactivity in body fat and organs, 24 hours after administration of radiolabeled ethynylestradiol-3-cyclopentyl ether (EECPE), ethynylestradiol (EE) and 17-β-estradiol (E_2) has been studied in castrated female rats. Radioactivity was highest in various types of fat of EECPE-treated animals. Only 1/10–1/30 as much tritium was detected in fat of rats treated with EE or E_2. Each steroid exhibited an individual preference for each particular type of fat. Concentration of steroid in the various organs did in general correspond to the amount of fat present. Free (ether soluble) metabolites were in general more concentrated in organs than in plasma whereas water soluble metabolites (presumably conjugates) were generally higher in plasma than in the various organs. The data on the $^{3}H/^{14}C$ ratio suggests that the ^{14}C-labeled cyclopentyl group is cleaved from EECPE and eliminated via the kidney at a faster rate than the steroid moiety.

Methylation of ethanolamine phosphatides by microsomes from normal and mutant strains of Neuspora crassa. G. A. Scarborough and J. F. Nye (Dept. of Biol. Chem., School of Med., Univ. of Calif., Los Angeles, Calif.). *J. Biol. Chem.* 242, 238–42 (1967). The phospholipid N-methyltransferase system in microsomes of normal *Neurospora crassa* was compared with those in two choline-deficient mutant strains. The normal transferase system catalyzed the three transmethylations leading to the synthesis of lecithin, and the three phosphatide bases involved in this sequence of reactions were isolated as isotope-labeled products. The microsomes of a mutant, strain 34486, proved to have a subnormal phosphatidylethanolamine N-methyltransferase activity. The microsomes of a second mutant, strain 47904, could not catalyze the two-step conversion of phosphatidylmonomethylethanolamine to lecithin at a measurable rate and therefore were deficient in the phosphatidylmonomethylethanolamine N-methyltransferase found in the normal strain. Evidence was presented to corroborate the view based on previous studies that a single enzyme in *N. crassa* converts phosphatidylmonomethylethanolamine to lecithin.

Composition of plasma triglyceride fatty acids and free fatty acids in hypothalamic obese mice. T. W. Redding and A. V. Schally (Endocrine and Polypeptide Lab., VA Hospital and Dept. of Med., Tulane Univ. School of Med., New Orleans, La.). *Proc. Soc. Exp. Biol. Med.* 124, 243–7 (1967). Changes in the composition of plasma triglyceride fatty acids and free fatty acids have been investigated in normal and gold thioglucose hypothalamic obese mice of the CBA and Swiss ICR strain. Significant elevations in palmitoleate were seen in plasma triglyceride fatty acids of CBA hypophysectomized gold thioglucose treated mice and in CBA gold thioglucose treated controls. Decreases in the levels of linoleate were also found in these two groups. Hypophysectomy alone did not result in changes in triglyceride fatty acid composition. An increase in palmitate and a decrease in linoleate were also seen in the plasma triglycerides of gold thioglucose treated mice of the Swiss ICR strain. The free fatty acid linoleate values were reduced by 50% in these mice. There was no significant increase in palmitoleate as seen in gold thioglucose treated CBA mice. The linoleate/palmitate ratio has been found to be a convenient index to follow changes in plasma fat composition.

Inhibition of fatty acyl desaturase by cyclopropene fatty acids. P. K. Raju and R. Reiser (Dept. of Biochem. and Biophysics, Texas A&M Univ., College Sta., Texas). *J. Biol. Chem.* 242, 379–84 (1967). Comparisons were made of the ratios of the specific activities of stearic acid to oleic acid in adipose tissue and liver triglycerides of rats given methyl stearate-l-^{14}C dissolved in 0.25 ml of corn oil and *Sterculia foetida* oil. The ratios were about 3 in the corn oil control animals compared to 31 to 43 in adipose tissue and 44 to 246 in liver triglycerides of the *S. foetida* test animals. When the labeled stearate was administered in 0.5 ml of *S. foetida* oil almost no label appeared in tissue oleic acid. The inhibition was also shown to be affected by sterculic acid *in vitro* with rat liver preparations. Evidence was obtained that the mechanism of inhibition is the irreversible binding of enzyme sulfhydryl groups by the cyclopropene group.

Testicular sterols. VI. Incorporation of mevalonate into squalene and sterols by cell-free preparations of testicular tissue. M. S. Nightingale, Su-chen Tsai and J. L. Gaylor (School of Nutr., Cornell Univ., Ithaca, N.Y.). *J. Biol. Chem.* 242, 341–9 (1967). Crude homogenates of rat testicular tissue (centrifuged at 10,000 × g for 20 min) do not convert mevalonic acid into squalene and sterols. Enzymes in the supernatant fraction from high speed centrifugation (105,000 × g) of testicular homogenate from rats or guinea pigs catalyze the formation of prenol pyrophosphates from mevalonate. Two cell-free preparations of rat testicular tissue have been obtained that catalyze the incorporation of mevalonate into squalene and lanosterol. Successful incorporation of mevalonate into prenol pyrophosphates and squalene by simultaneous incubation of microsomes and soluble enzymes is ascribed either to suitable inactivation of the competing enzymatic processes or to compensation by the addition of cofactor-generating systems. Comparison of similar synthetic and competitive activities from rat liver and rat or guinea pig testis indicates that the ratio of synthetic activities to competitive processes is much more favorable for sterol synthesis by liver enzymes than by testicular enzymes.

Studies on the biosynthesis of ergosterol in yeast. H. Katsuki and K. Bloch (J. B. Conant Lab., Harvard Univ., Cambridge, Mass.). *J. Biol. Chem.* 242, 222–27 (1967). Cell-free extracts of yeast convert ^{14}C-mevalonic acid into squalene, lanosterol, zymosterol and sterols more polar than ergosterol. Formation of two of the more polar sterols (E_{s1} and E_{s2}) has also been demonstrated with methyl-labeled methionine and with ^{14}C-adenosylmethionine as precursors. The tentative structure 5,7,22,24(28)-ergostatetraene-3β-ol is assigned to sterol E_{s2}. Intact yeast cells convert zymosterol to E_{s2} anaerobically, and aerobically they convert E_{s2} to ergosterol.

Platelets, fatty acids and thrombosis. J. C. Hoak, E. D. Warner and W. E. Connor. *Circulation Res.* 20, 11–17 (1967). The sodium salts of stearic, oleic and linolenic acids were added to human washed platelet suspensions and platelet-rich citrated plasma. Aggregation of platelets was measured microscopically and with a turbidimetric method. All of the fatty acids had the ability to produce aggregation when added to washed platelets, but stearic acid, a long-chain saturated fatty acid, was more potent than were the unsaturated acids when added to platelet-rich plasma. Aggregation of platelets by fatty acids required the presence of calcium ions and the aggregation was irreversible. The addition of albumin diminished the aggregating effects of fatty acids, but microscopic aggregates still formed in most instances. Subnormal aggregation was noted when sodium stearate was added to platelet-rich plasma from a patient with a severe deficiency of factor XII (Hageman factor). Thus, fatty acids are now known to have two potential thrombogenic effects: platelet aggregation and the activation of clotting factors involved in the early stages of blood coagulation.

The enzymatic synthesis of wax in liver. S. J. Friedberg and R. C. Greene (Dept. of Med. and Biochem., Duke Univ. Med. Center, Durham, N.C.). *J. Biol. Chem.* 242, 234–37 (1967). An enzyme system present in both mammalian and dogfish liver was found to catalyze the conversion of cetyl alcohol to wax. The product was isolated by column chromatography and repeated thin-layer chromatography. It was identified by thin-layer chromatography, by analysis of the hydrolysis products, and by gas chromatography. Microsomal and supernatant fractions of liver were active. Synthesis was stimulated by detergents such as Triton X-100, Tween 20 and bile salts. Wax formation occurred without activation, i.e. formation of acyl coenzyme A. With an enzyme preparation from which lipids had been substantially removed wax synthesis required both long chain fatty acids and cetyl alcohol. It is postulated that the synthesis of waxes from long chain alcohols and fatty acids without activation is possible in an environment from which water is essentially excluded and can be envisioned as resulting from the interaction of two nonpolar compounds and an enzyme in a micellar state.

Preliminary observations on reversal of hypovolemia with intravenous fat emulsion. D. F. Flick, J. B. Scott, and R. A. Hardin (Biochem. Div., US Army Med. Res. Lab., Fort Knox, Ky.). *Proc. Soc. Exp. Biol. Med.* 124, 75–9 (1967).

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NEW ORLEANS MEETING SCHEDULE

Committee Meetings

	Baronne Room	Red Oak Room	Southern Pine Room	Orleans Room
SUNDAY, MAY 7				
9:00–10:00			Lipids Advisory Bd. and Ed.	
10:00–11:00		Exam. Bd.	Lipids Advisory Bd. and Ed.	
11:00–12:00		Exam. Bd.	Lipids Advisory Bd. and Ed.	
1:00– 2:00		Gov. Bd.	Biochemical Methods Comm.	
2:00– 3:00		Gov. Bd.	Biochemical Methods Comm.	
3:00– 4:00		Gov. Bd.	Biochemical Methods Comm.	
4:00– 5:00		Gov. Bd.	Biochemical Methods Comm.	
5:00– 6:00		Gov. Bd.		
6:00– 8:00		MIXER		
MONDAY, MAY 8				
9:00–10:00		Neutral Oil Loss Sub.	Blood Lipid Determ. Sub.	
10:00–11:00	Hydrog. Oils Subcomm.	Feed Grade Fats Sub.	Blood Lipid Determ. Sub.	
11:00–12:00	Fatty Nitrogen Subcomm.		Blood Lipid Determ. Sub.	
1:00– 2:00	Drying Oils Subcomm.	Membership Comm.		
2:00– 3:00	Adv. Comm.	Aflatoxin		
3:00– 4:00	Adv. Comm.	Aflatoxin	Color Standards Sub.	Honored Student Program Comm.
4:00– 5:00	Epoxidized Oils Subcomm.	Aflatoxin	Instrumental Techniques Comm.	Education Comm.
5:00– 6:00		Internat'l Relations Comm.	Instrumental Techniques Comm.	Education Comm.
TUESDAY, MAY 9				
8:00– 9:00		Journal Comm.		
9:00–10:00	Dibasic Acid Sub.	Journal Comm.		
10:00–11:00		Com'l Fatty Acids Sub.		
11:00–12:00	Polymerized Acids Sub.			
1:00– 2:00	Local Section Liaison Comm.	Cellulose Yield Sub.		Uniform Methods Comm.
2:00– 3:00		Cellulose Yield Sub.	Bleaching Methods Sub.	Uniforms Methods Comm.
3:00– 4:00		Seed & Meal Analysis Comm.	Nat'l Meet. Plan. Comm.	Uniform Methods Comm.
4:00– 5:00	AOAC Detect. of Animal Fats	Seed & Meal Analysis Comm.	Nat'l Prog. & Plan. Comm.	Com'l Fats & Oils Anal. Comm.
5:00– 6:00	AOAC Detect. of Animal Fats		Nat'l Prog. & Plan. Comm.	Com'l Fats & Oils Anal. Comm.
6:00–10:00		ANNUAL BANQUET		
WEDNESDAY, MAY 10				
8:00– 9:00			Indus. Oils & Derivatives Comm.	
9:00–10:00		Standards Comm.	Indus. Oils & Derivatives Comm.	
10:00–11:00		Standards Comm.	Smalley Check Sample Comm.	
11:00–12:00	Water Soluble Protein Comm.	Safflower Seed Anal. Comm.	Smalley Check Sample Comm.	
1:00– 3:00		AWARDS LUNCHEON		
3:00– 6:00		Gov. Bd.	AOAC-AOCS Comm. on Aflatoxins	

(Continued from page 164A)

A total of 8 mongrel dogs was bled 56–65% of calculated blood volume at rates of 5–14 ml/min. At the end of 60 minutes in hypovolemia the animals were treated experimentally in the following manner: 1) 3 dogs were given no infusion; 2) 2 dogs were infused with an emulsion containing no fat; and 3) 3 dogs were infused with an emulsion containing fat (15% cottonseed oil). The infusions were administered in a volume equivalent to the volume of blood withdrawn. Dogs which received no intravenous infusion died within 3½ hours after massive hemorrhage. Animals infused with an emulsion containing no fat recovered from the experimental hemorrhage but were not physically active within the first week of the posthemorrhagic period. Dogs infused with complete emulsion recovered rapidly after massive hemorrhage and accepted food and water within a few hours after regaining consciousness. These animals were fairly active during the first week after massive hemorrhage and recovered without event within two weeks. All dogs receiving infusions lived longer than 4 months.

REMOVAL OF FATTY ACIDS FROM SERUM ALBUMIN BY CHARCOAL TREATMENT. R. F. Chem (Lab. of Tech. Dev., Nat. Heart Inst., Bethesda, Md.). *J. Biol. Chem.* **242**, 173–81 (1967). The fatty acid contents of 26 different serum albumin preparations representing different species and obtained from various commercial sources have been determined. Some samples had surprisingly little fatty acid contamination, but it was found that other samples contained between 2 and 3 moles of acid per mole of protein, in confirmation of earlier reports. Treatment of these samples with charcoal at low pH resulted in the virtually complete removal of fatty acids. The conditions for such treatment were investigated as a function of the type of fatty acid, pH and the amount of charcoal required. Acid-charcoal treatment is a much more rapid method of removing lipid impurities than other methods previously described.

• Drying Oils and Paints

DEGRADATION OF PAINT FILMS. III—INFRARED SPECTRAL CHANGE OF DRYING OIL FILMS ON OUTDOOR EXPOSURE. T. Takeshita, N. Miyauchi and R. Imai. *J. Jap. Soc. Col. Mat.* **39**, No. 4, 188–96 (1966) (in Japanese, with long English summary).—Films of linseed oil and polymerised Chinese tung oil were coated on polyethylene film (20 μ thickness) at about 25 μ thickness, then dried for 1 week. The films were exposed for 8 weeks outdoors, then I.R. spectra were recorded using a double-beam type spectrophotometer with reference to uncoated polyethylene film. Changes in weight, hardness and gloss of the films (on glass) after exposure were noted. The results are reported and discussed. (Rev. Current Lit. Paint Allied Ind. No. 295.)

NATURAL EPOXY FATTY ACIDS. Anon. (U.S.D.A.). *Paint Manuf.* **36**, No. 4, 44 (1966). A new natural source of epoxy fatty acids is under investigation. Only two wild plants from among several thousands examined were found to yield significant quantities of epoxy fatty acids. *Euphorbia lagascae,* related to castor and tung, and *Vernonia anthelmintica,* a cousin of the sunflower, are now being grown by the U.S.D.A. for seed and seem adaptable to culture on southern U.S. corn (maize) and cotton lands. The yield of oil from *Euphorbia* is 40–50%, about double that from *Vernonia.* Although the latter is richer in epoxy acids, the high oil content of *Euphorbia* seems more promising. Processing, which is necessary for full epoxidation, is said to be faster and cheaper than full epoxidation of the more usual oils. The products show promise in imparting flexibility and heat- and sunlight-resistance to polyvinyl chloride. They are expected to produce good drying oils. (Rev. Current Lit. Paint Allied Ind. No. 295.)

PROSPECTS OF THE DEVELOPMENT OF CHEMISTRY AND ITS CONSEQUENCES FOR THE PAINT INDUSTRY. M. Guillemonat. *Double Liaison* 1966, No. 129, 621–4. The possibilities of further development of paint media are examined. The classical organic polymers contain mainly or exclusively C, H and O, but chlorinated rubber is already on the market. Substitution of Cl by F seems to be very interesting owing to the high stability of the C-F bond. Silicone resins are improved if the simple radicals (methyl, ethyl or phenyl) bound to the Si are replaced by more elaborate organic chains. Once more, the introduction of F atoms increases thermal and chemical stabilities. Researches using B, P and S derivatives are reviewed. The introduction of metallic atoms in the organic macromolecule has also been studied by many authors. These metallic atoms are either bound to the Si-O chain or complexed

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New Date for Athens Symposium, "Fresh Water from the Sea"

Because of a conflict of dates with the recently announced "Water for Peace" Conference in Washington, the 2nd European Symposium on Fresh Water from the Sea will be held one week earlier than originally planned, i.e., from May 9–12, 1967, in Athens.

Included in the program are 136 lectures by well-known scientists, including the following:

1) Distillation Processes: Use of Nuclear Energy, Multistage Flash Evaporation, Other Distillation Processes, Scale Formation and Its Prevention, Corrosion Phenomena.
2) Freezing Processes: Electrodialysis, Reverse Osmosis (Hyperfiltration), Membrane Properties, Ion Exchange Techniques.
3) Freezing Processes and Hydrates.
4) Evaporation by Means of Solar Energy.
5) Other Desalting Processes.
6) Economic Considerations.
7) Properties of Sea Water.
8) General.

A three-day cruise will follow the symposium, and will take participants to the islands of Mykonos, Patmos, Symi and Rhodos. Discussions of the papers will take place on board ship.

As an alternative to the cruise offered, participants may attend the official dedication of the Patmos Solar Distillation Plant, largest in the world, and visit the solar stills at the island of Symi.

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(Continued from page 166A)

by organic molecules. (Rev. Current Lit. Paint Allied Ind. No. 294.)

PROCESS FOR PRODUCING OIL-MODIFIED ALKYD RESINS. P. J. Campagna (Allied Chemical Corp.). *U.S. 3,291,765.* A process for producing an oil-modified alkyd resin consists essentially of mixing an ester of an olefinic higher aliphatic acid with phthalic anhydride and hydrogen peroxide in the proportion of 1.5 to 2 mols of phthalic anhydride and 1.25–1.75 mols of hydrogen peroxide per mol of ester. The reaction mixture is maintained at a temperature suitable to effect epoxidation of the ester, then a polyhydric alcohol is added to the reaction mixture in the ratio of 1 mole per 3.5–4.5 mols of reaction mixture and the resultant reaction mixture is heated to produce an oil-modified alkyd resin having an acid number less than 10.

EMULSIONS OF CURABLE RESINOUS COMPOSITIONS AND A SALT OF AN ADDUCT OF AN UNSATURATED DICARBOXYLIC ACID AND A FATTY OIL. F. S. Shahade and R. M. Christenson (Pittsburgh Plate Glass Co.). *U.S. 3,293,201.* An air-drying aqueous emulsion coating composition consists essentially of (I) from 5 to 70% by weight of an adduct of (a) 6–45% by weight of a member of the class consisting of alpha-beta-ethylenically unsaturated dicarboxylic acids and mixtures thereof, and (b) 55–94% by weight of an unsaturated fatty ester, the adduct having at least 50% of its acidity neutralized, and (II) from 30 to 95% by weight of a resinous composition selected from the class consisting of epoxy esters containing unconjugated unsaturated aliphatic radicals of at least 8 C atoms; adducts of an unsaturated fatty acid containing at least 8 C atoms and a polymer of an unsaturated primary alcohol and a monomer containing a single $CH_2=C<$ group; diisocyanate modified alkyd resins and diisocyanate modified drying oils.

COATING COMPOSITIONS COMPRISING EPOXY RESIN FATTY ACID ESTER-HYDROCARBON RESIN REACTION PRODUCTS. W. J. Belanger (Devoe & Raynolds Co.). *U.S. 3,294,721.* A binder composition for use in coating compositions comprises: (A) 10 to 50% by weight of a polymerizable unsaturated hydrocarbon resin, and (B) 90 to 50% by weight of an epoxy resin ester free of unreacted epoxy groups and containing 30 to 60% by weight, based on the weight of the ester, of drying oil acids, the said epoxy resin being a glycidyl ether of a polyhydric phenol. The reaction between A and B is conducted to a point where the viscosity of the reaction product, expressed in centipoises for a 50% solids solution in xylene, is at least four times the viscosity of the substantially unreacted initial mixture of A and B.

DRYING OIL COMPOSITION AND A PROCESS FOR IMPROVING PARTICLE BOARD. G. D. Mase (Standard Oil Co.). *U.S. 3,297,603.* An improvement is claimed in the process of manufacturing particle board in which wood particles are first coated with a urea-formaldehyde binder composition and the coated particles then consolidated and bonded together by compression at high temperatures and pressures. The improvement consists of the step of applying to the urea-formaldehyde coated wood particles, prior to compression, 1–15% by weight, based on the dry weight of the wood particles, of a drying oil composition consisting essentially of (A) 10–60% by weight of a hydrocarbon drying oil having an iodine number between 120 and 350; (B) 10–75% by weight of a vegetable drying oil; (C) 5–50% by weight of a petroleum oil solvent boiling below 750F and having at least 50% boiling at temperatures above 350F; and (D) from 0.1 to 10% of a metal drier.

• Detergents

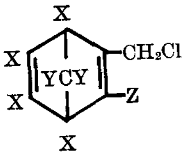
SURFACE ACTIVE DERIVATIVE FROM GLYCIDYL- AND GLYCERYL ETHERS. X. SOLUBILIZATION AND DISPERSION OF 1,4-DIAMINOANTHRAQUINONE BY NONIONIC SURFACTANTS DERIVED FROM GLYCERIDE HIGHER DIETHERS. Tsunehiko Kuwamura, Koji Sasahara, Kazuhisa Tobikawa and Eiichi Kameyama. *Yukagaku* 16, 17–22 (1967). Solubilization power of nonionics of a new type, $(ROCH_2)_2CHO(C_2H_4O)_nH$ (I) and of a common type, $R'O(C_2H_4O)_nH$ (II), with various contents of ethylene oxide ($R = C_5$, C_8, C_9, C_{10}, C_{12}, α-naphthyl, $R' = n\text{-}C_{12}$, $n\text{-}C_{18}$) and their effects on the disperse dyeing of acetate rayon were examined using 1,4-diaminoanthraquinone as a solubilizate or dye. As to the solubilization power per mole of surfactant, I or II containing higher alkyl and longer polyoxyethylene (POE) chains were better solubilizers and I containing n-C_8 to C_{12} alkyl chains were somewhat better than those of II with the same content of ethylene oxide as I. However, comparison of solubilized amount (S/n) per oxyethylene unit showed it to be higher in II than I. In both types of nonionics, the S/n value was not always increased with an increase in the length of R or POE chain. Dyeing tests of I and II were given.

ASPHALT EMULSION. I. VISCOSITY AND STABILITY OF CATIONIC ASPHALT EMULSIONS. Yutaka Wada, Hiromi Izaiku and Motoo Koike (Nippon Oils & Fats Co., Amagasaki). *Yukagaku* 16, 23–9 (1967). An increase in asphalt content above 60 wt % is accompanied by a remarkable increase of viscosity of emulsion. The viscosity of emulsion depended upon the kinds of asphalt used. It seems difficult to foresee the adaptability of emulsifiers from the estimation of surface tension and interfacial tension.

A NEW ACCELEROTOR TEST AND ITS COMPARISON WITH HOME TYPE LAUNDERING TESTS AS A MEASURE OF ABRASIVE WEAR. R. T. O'Connor (U.S. Dep't. Agr.). *Am. Dyestuff Rept.* 55, 82–90 (1966). The effectiveness and reliability of wash and tumble dry tests to evaluate abrasion resistance of garments treated with durable press finishes have been investigated and compared with those of laboratory tests for measuring abrasion. Fabrics of varying construction were chemically treated to impart no-ion properties and were fabricated into trouser cuffs. Conventional and experimental delayed curing techniques were used to crease the cuffs. These simulated trouser cuffs were subjected to a number of wash and tumble dry cycles in home type washers and dryers of different ages. A measure of abrasion based on these lengthy home type laundering tests was compared with abrasion of the same fabrics in a newly developed, rapid Accelerotor edge abrasion test. Results show that the extent of abrasion determined by the Accelerotor test is as reliable as that obtained by repeated cycles of washing and tumble drying and is much less time consuming. The changes in physical properties during laundering appear to be unrelated to resistance to abrasion based on the appearance of the trouser cuffs. Newer washing units correlate very well with each other and with the Accelerotor abrasion test results. Older units are not as reliable in predicting the resistance of a treated fabric to abrasion.

METHYL-BETA-HYDROXYDODECYL SULFOXIDE CONTAINING DETERGENT COMPOSITIONS. D. J. Anderson (Chevron Res. Co.). *U.S. 3,290,254.* A detergent composition is claimed, consisting essentially of 5-40 parts by wt. of methyl-β-hydroxydodecyl sulfoxide and 60–95 parts by wt. of a water soluble detergent builder salt selected from the class consisting of alkali metal sulfates, carbonates, silicates, phosphates, borates and mixtures thereof.

GERMICIDAL SOAP COMPOSITIONS. V. Mark (Monsanto Co.). *U.S. 3,294,691.* An antiseptic cleansing agent consists essentially of alkali metal fatty acid soaps containing a bacteriostatic amount of a compound of the formula



wherein X, Y and Z are selected from a class consisting of chlorine, bromine, iodine and fluorine.

STRIPED SOAP BARS AND METHOD AND APPARATUS FOR MAKING THE SAME. W. A. Kelly and P. J. Petix (Lever Bros. Co.). *U.S. 3,294,692.* A cleansing bar comprises an extruded matrix of a water-soluble cleansing compound in the shape of a bar having a pair of principal faces on opposite sides and opposed grooves along these faces, parallel to each other and to the grain of extrusion, extending into the matrix and terminating about the midplane of the bar. A second water-soluble compound is extruded concurrently with the matrix in each of the grooves, the cleansing bar thereby having stripes extending into it in a parallel relationship to each other and to the grain of the cake. Both cleansing compounds consist of at least one member of the group consisting of soaps, non-soap synthetic detergents and mixtures thereof, being of such a consistency that they may be extruded through an orifice and formed and hardened into a self-sustaining cake.

PHOSPHORYLATED SURFACTANTS AS HYDROTROPES. J. Dupre and D. B. Fordyce (Rohm & Haas Co.). *U.S. 3,294,693.* A composition useful in alkaline cleaning solutions and in liquid detergent concentrates is claimed, consisting essentially of 75–99.5% of an alkaline builder from the class containing sodium and potassium hydroxides, carbonates, silicates and phosphates, and 0.5–25% of a blend of 10–80% of a nonionic surfactant and 20–90% of a hydrotrope. The non-ionic should be a member of the class consisting of alkoxy, alkylamine and alkylphenoxy polyethoxy adducts with 1 to 30 ethylene oxide units, the alkyl portion of the alkoxy and alkylamine compounds containing 10–15 C atoms and the alkyl portion of the alkylphenoxy compounds 8–12 C atoms. The hydrotrope should be a surface active composition containing upwards of 85% primary phosphate esters derived from the condensation reaction of $R(CH_2CH_2O)_xH$ and polyphosphoric acid, where R is either an alkyl (C_6-C_{10}) phenoxy group or a C_{10}-C_{18} alkoxy group and x is a number from 1 to 20. The phosphate esters are prepared by reacting from 0.6 to 2.0 mols of polyphosphoric acid with each mole of the described condensation product, the polyphosphoric acid being a mixture of phosphoric acids with a phosphoric acid anhydride content of 73–85% expressed as P_2O_5.

SURFACE ACTIVE AGENTS FROM ORGANOMETALLIC COMPOUNDS UTILIZING A FRIEDEL-CRAFTS CATALYST. M. H. Earing and J. T. Patton, Jr. (Wyandotte Chemicals Corp.). *U.S. 3,294,848.* A process for the production of a non-ionic surface active agent containing a cogeneric mixture of polymers comprises the steps of (1) adding aluminum chloride to a Group I metal-aluminum alkyl, wherein each alkyl group has 4 to 24 C atoms, inclusive, in a solvent substantially inert to the reaction, (2) condensing an alkylene oxide having 2 to 4 C atoms with the Group I metal-aluminum alkyl of step (1) in the presence of aluminum chloride, and (3) hydrolyzing the product of step (2) by admixture and reaction with an acid.

COMPRESSED FACE POWDER CAKE COMPOSITION. A. Kaye and H. J. Amsterdam. *U.S. 3,296,078.* A compressed face powder cake composition comprises in a homogeneous mixture (45–65% (by wt.) talcum containing a wetting agent, titanium dioxide, an insoluble metal stearate and an iron oxide pigment. The talcum is combined with 15–20% of cosmetically applicable lubricating materials, with cosmetically applicable medical agents such as salicylic acid, allantoin, hexachlorophene and alkyl dimethyl benzyl ammonium chloride and with 0.1 to 0.25% (by wt.) cosmetically applicable preserving agents.

ALKYLBENZENE SULFONATE DETERGENT COMPOSITIONS CONTAINING 2-HYDROXY-1-AMINO ALKANES. J. A. Meyers *et al.* (Atlantic Richfield Co.). *U.S. 3,296,146.* A detergent composition having improved detergency properties comprises a water solu-

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Lipid Research Fellowships Offered by St. Andrews Group

Vacancies exist for postgraduate students and postdoctoral fellows in the lipid research group led by Frank Gunstone in St. Andrews University (St. Andrews, Scotland). One of these vacancies arises from the return of R. G. Powell to the Northern Regional Laboratories (Peoria) after a one-year visit to St. Andrews. Other workers from the laboratory who have undertaken lipid research in the United States include L. J. Morris (Hormel Institute), R. J. Hamilton, (Baylor Medical Center, Houston), and W. W. Christie (Hormel Institute). Current work is concerned with acids of novel structure, glyceride studies, and the synthesis, properties, and reactions of polyethenoid acids.

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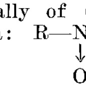
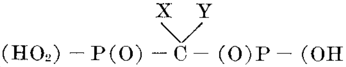
ble alkyl benzene sulfonate with 9 to 15 C atoms in the alkyl side chain and, as a detergency improving agent, 2-hydroxy-1-amino alkanes of the formula $R—CHOH—CH_2NH_2$, where R is an alkyl radical having from 4 to 18 C atoms. The detergency improving agent is present at a level of 0.3 to about 3.3% (by wt.) based on the amount of water soluble alkylbenzene sulfonate present.

QUATERNARY AMMONIUM-TERTIARY AMINE OXIDE COMPOSITIONS. J. C. Findlan *et al.* (Millmaster Onyx Corp.). *U.S. 3,296,145.* A germicidal agent consists essentially of (1) at least one tertiary amine oxide of the formula:  $R—\underset{\substack{\downarrow\\ O}}{N}—R'R''$ where R is an alkyl or alkenyl with 8 to 20 C atoms and R′ and R″ are lower alkyl or hydroxyalkyl groups, and (2) at least one germicidal quaternary ammonium compound having at least one long chain alkyl group of 8 to 22 C atoms attached to the quaternary nitrogen and having a phenol coefficient of at least 100 with respect to *Staphylococcus aureus* and *Salmonella typhosa* at 20C. The amine oxide and quaternary ammonium compound are present in the relative proportions of from 50:1 to 5:1 parts by weight. A method of simultaneously cleaning and sterilizing human tissue by application of the above described composition is also claimed.

CLEANER FOR FOOD RESIDUES. E. M. Gatza (Dow Chemical Co.). *U.S. 3,296,147.* A cleaning composition is claimed consisting of water, ammonia (NH_3 content from 0.05 to 10% by wt., based on the water), an alkali metal alkaline compound in an amount from 0.1 to 15% by wt., based on the water, and an aliphatic halo-hydrocarbon solvent with a molecular weight up to 150, the halogen being either chlorine or bromine and the solvent being present in an amount of 2 to 95% by volume, based on the water. The ammonia, alkaline compound, solvent and water all contribute to the cleaning properties of the resulting mixture.

BLEACHING, STERILIZING, DISINFECTING AND DETERGING COMPOSITIONS. M. M. Crutchfield and R. R. Irani (Monsanto Co.). *U.S. 3,297,578.* An improved bleaching and sterilizing composition consists essentially of a stable mixture of a chlorine-releasing agent and a sequestering agent selected from the group of compounds having the formula:



$$(HO_2)-P(O)-\overset{\substack{X\ \ Y\\ \diagdown\diagup}}{C}-(O)P-(OH)_2$$

where X is either hydrogen or a lower alkyl group and Y is either hydrogen, hydroxyl or a lower alkyl group with from 1 to 4 C atoms. Alkali metal salts, ammonium salts and amine salts of this sequestering agent can also be used. The chlorine-releasing agent and the sequestering agent are present in a ratio of 50:1 to 5,000:1 on a per cent available chlorine to weight of sequestering agent basis.

PROCESS FOR PREPARING A DETERGENT COMPOSITION CONTAINING SODIUM ALKANESULFONATE AND SOAP. J. K. Weil, A. J. Stirton, F. D. Smith and R. G. Bistline (U.S. Dep't. Agr.). *U.S. 3,297,579.* A process is described for the preparation of a detergent composition containing as essential active ingredients a sodium alkanesulfonate and a soap, with a ratio of alkanesulfonate to soap of from 2.4:1 to 2.8:1. The disodium salt of an α-sulfocarboxylic acid having the general formula $RCH_2XH(SO_3Na)COONa$, where R is a straight chain alkyl radical with 11, 13 or 15 C atoms, is mixed with sodium hydroxide in a ratio of from 2:1 to 2.5:1. The mixture is stirred and heated to fusion under a nitrogen atmosphere until the reaction is substantially complete, then cooled to below 100C and the excess alkali neutralized with an aqueous mineral acid such as sulfuric, hydrochloric or phosphoric acid. The neutralized reaction mixture is dried to give a dry detergent composition containing a sodium alkanesulfonate and sodium soap of the general formulas $RCH_2CH_2SO_3Na$ and $RCOONa$, respectively.

ALKYLBENZENE SULFONATE COLOR AND ODOR INHIBITION. J. B. Wilkes (Chevron Res. Co.). *U.S. 3,297,748.* An improvement is claimed in the process for producing a branched-chain monoalkylbenzene sulfonate detergent at a temperature in the range of 50 to 150F by sulfonating with oleum a branched-chain monoalkylbenzene hydrocarbon having from 9 to 18 C atoms in its alkyl chain. The improvement consists in conducting the sulfonation reaction in the presence of from 0.5 to 6.0% by weight, based on the weight of the alkylbenzene, of acetic acid and of a lower alkylbenzene represented by the formula: $C_6H_5-CR_1R_2H$ where R_1 and R_2 are methyl, ethyl or propyl groups. The branched-chain monoalkylbenzene sulfonates thus produced have improved color and odor characteristics.

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