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CHARTER FLIGHT: A charter has been arranged with Pan American Airways to leave Chicago, Illinois, on February 27, 1976, and to return from Amsterdam on March 8, 1976. New CAB rules make it possible for all interested parties to fly without regard to AOCS membership. The new type of charter, OTC, requires a minimum prepaid ground package which is applied to the hotel and ground transportation. Final details are being planned now, but the lateness of the CAB ruling makes it impossible to give all details at this time. Full particulars will be announced and sent to those who have reserved space as soon as they are available. Cost of the charter, at current tariffs, is $320.00 per person round trip plus an additional $150.00 per person prepaid ground package which will be applied to the hotel bill.

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abstracts

EDITOR: S. KORITALA

ABSTRACTORS: N.E. Bednarcyk, J.E. Covey, J.C. Harris, F.A. Kummerow, T. Mares, B. Matijasevic, J.C. Means, D.B.S. Min, and E.G. Perkins

• Fats and Oils

NICKEL-CONTAINING HYDROGENATION CATALYSTS FOR THE SELECTIVE HYDROGENATION OF FATS AND OILS. F.J. Broecker, J. Heners, L. Marosi, M. Schwarzmann, and P.R. Laurer (BASF Ag.). *U.S. 3,896,053.* The catalyst is prepared by calcining a compound of the formula $Me_6^{(2+)}Al_2(OH)_{16}CO_3 \cdot 4H_2O$. $Me^{(2+)}$ is nickel, copper, or cobalt. The calcined compound is reduced with hydrogen at 200–600 C. The base compound to be calcined is prepared from an aqueous solution containing 1 M to 2 M solutions of the divalent metal salts and of trivalent aluminum salt by precipitation with a 1 M to 2 M alkali metal carbonate or bicarbonate solution at 50–95 C and pH 4.0–8 5. After precipitation, the compound is washed, filtered, and dried.

CONTROL OF ENVIRONMENTAL POLLUTION IN TALL OIL FRACTIONATION. D.F. Bress (Foster Wheeler Energy Corp.). *Reissue 28,476.* A plant for treating the stripping steam and odorous material carried therein after stripping a tall oil fractionation tower in a manner to reduce pollution consists of (1) a conduit circuit comprising a condenser with means for recycling some of the condensate and a purging outlet, (2) a vaporizer connected to the purging outlet to separate the odorous material, (3) a conduit for directing the odorous material to the fractionating tower, and (4) means to separate the odorous material and water from noncondensible gases so they can be incinerated.

COOKING OIL FILTERING. J.R. Murphy. *U.S. 3,894,482.* The apparatus comprises a cooking pot, a heating means, a drain, and a filter connected to the drain. A tank for storing the filtered oil is connected to the filter, and a pump returns the filtered oil through the heater to the pot. The filter comprises a horizontally elongated housing having an opening near one end for receiving oil from the drain and a plurality of lateral openings for flowing oil into the tank.

CHOCOLATE COATING COMPRISING HYDROXYLATED LECITHIN. F.P. Colten and M. Kaplan (General Foods Corp.). *U.S. 3,895,105.* A composition adapted for use as a coating for confections and bakery products comprises a chocolate product and hydroxylated lecithin. The lecithin is present in an amount effective to retard moisture loss from confections and bakery products coated with the composition.

Processing of wheat germ to retard rancidification. E.G. Huessy (Peavey Co.). *U.S. 3,895,121.* The method of stabilizing wheat germ comprises the steps of (a) heating natural wheat germ at 200–295 F and a pressure in excess of 1000 psi until it becomes plasticized; (b) extruding the plasticized wheat germ at 1,000–29,000 psi into a cohesive ribbon; and (c) heat treating the extrudate at 300–425 F for 2–30 minutes.

Preparation of mixed lithium-calcium soap thickened greases. D.A. Carley and F.T. Crookshank (Texaco, Inc.). *U.S. 3,891,564.* A nonmelt process is used to prepare mineral oil-based greases combining good lubrication properties, good resistance to water, and a smooth, nongrainy appearance. The greases are thickened by a mixture of calcium soaps and lithium soaps fromed *in situ* through the saponification of a fatty material with a mixture of calcium hydroxide and lithium hydroxide.

Recovery of fats, oils, and proteins from waste liquor. T. Sato and K. Ishida (Kyowa Hakko Kogyo Co.). *U.S. 3,891,770.* A process for the treatment of waste liquor resulting from processing marine products and livestock comprises (1) adding polyacrylate to the waste liquor, (2) subjecting the waste liquor to microfine aeration to develop a froth, (3) denaturing the froth by adjusting the pH to 8.0–11.0, (4) subjecting the froth to enzymatic decomposition by adding a protease to it, and (5) separating and recovering the fats and oils from the froth.

Preparation of methyl esters. E.N. Gutierrez and R.C. Reardon, Jr. (Lever Bros. Co.). *U.S. 3,892,787.* Mono- and polyhydric aliphatic primary alcohols are treated with chlorine in methanol at 0–80 C. The ratio of methanol to primary alcohol is 5:1–20:1 and the ratio of chlorine to methanol is 0.1:1–10:1.

Extraction of glyceride oils by selective solvents. A.M. Parsons (Lever Bros. Co.). *U.S. 3,892,789.* A process for increasing the combined polyunsaturated fatty acid content of edible oils having a combined linoleic acid content of at least 50% comprises contacting the oil with an N-substituted amide solvent such as dimethyl formamide, N-lower alkyl pyrrolidone, or 1,6-bis pyrrolidon-2-yl-hexane at a temperature at which two liquid phases are formed. The polar solvent contains the part of the oil rich in linoleic acid. The two fractions are separated and the solvent removed from the linoleic acid rich oil.

Simultaneous determination of triglycerides, cholesterol, and phospholipids. J.D. Pinto and S.I. Hilburg (American Cyanamid Co.). *U.S. 3,894,844.* A method for the simultaneous determination on a single sample of human plasma or serum comprises the steps of: (a) adding isopropyl alcohol to the sample to dissociate triglycerides, cholesterol, and phospholipids from lipoproteins; (b) mixing the alcoholic solution with an adsorbent comprising 1–0.7 g alumina and 0.25 g silicic acid to separate the triglycerides and cholesterol from the adsorbed phospholipids; (c) separating the adsorbent from the solution; (d) eluting the phospholipids with isopropyl alcohol-ammonia solution; (e) saponifying portions of the alcohol solution and the alcohol-ammonia eluate to hydrolyze the triglycerides and the phospholipids to glycerol; (f) oxidizing the saponified glycerol to formaldehyde with the same reagent; (g) adding the same color developing reagent to both solutions; (h) treating another portion of the isopropyl alcohol solution with a different color reagent to develop cholesterol color; and (i) performing colorimetric readings on each of the three solutions.

Comprehensive evaluation of fatty acids in foods. II. Beef products. B.A. Anderson, J.A. Kinsella and B.K. Watt (Consumer and Food Economies Inst., A.R.S., U.S.D.A., Hyattsville, Md.). *J. Am Diet. Assoc.* **67**, 35–41 (1975). An extensive table of the fatty acid composition per 100 g of separable lean, separable fat, and total edible portions of Choice grades of beef is given. Values for raw and cooked meats are given separately. In addition, a table of the mean fatty acid composition per 100 g of fat for lean and adipose tissues is presented. The data were gathered from the literature, both published and unpublished, from the last fourteen years. They were derived exclusively from GLC analyses. The variables which can influence beef lipid composition and which were considered in evaluating data to be incorporated into the table are briefly discussed. Methods for converting methyl ester data into per cent composition of fatty acids in the meat cut are presented. Fatty acid patterns for the separable fat and separable lean of various meat cuts were not significantly different at the 5% level. Cooking by dry or moist heat was found to have little effect on relative fatty acid composition.

Manufacture of crystalline, flowable, stable fat powders. E. Grolitsch. *U.S. 3,892,880.* A method for continuously converting fat which is completely solid at 20 C into a crystalline, flowable, stable powder comprises the steps of (1) melting the fat; (2) chilling it under conditions which result in the formation of a high concentration of β-crystals; (3) heating the composition slightly to reduce its viscosity and dissolve any residual β'-crystals but not melt the β-crystals; (4) spray-chilling the fat to form small particles comprised primarily of β-crystals; (5) discharging the flowable fat powder from the crystallization chamber; and (6) ripening the powder at 0–10 C for 0.5–10 minutes in a low humidity atmosphere.

Digested alkaline tall oil pitch soap composition. Y.C. Chiu (Shell Oil Co.). *U.S. 3,892,668.* The composition is produced by mixing each part of tall oil pitch with 1–5 parts of an aqueous solution of an alkaline material which is substantially free of polyvalent cations which form water insoluble salts of the fatty acids. The alkaline material is selected from the group consisting of alkali metal and ammonium hydroxides, carbonates, phosphates, fluorides, and borates and also alkali metal and ammonium salts of lower molecular weight carboxylic acids. The solution contains an amount of dissolved monovalent cationic alkaline material to provide an excess alkalinity, relative to the acid number of the pitch, of 20–80%. The mixture is heated for a time and temperature equivalent to from 4 hours at 70 C to 16 hours at 110 C.

Chemical and nutritive changes in refined groundnut oil during deep frying. K. Vidyasagar, S.S. Arya, K.S. Premavalli, D.B. Parihar and H. Nath (Defense Food Res. Lab., Mysore, India). *J. Food Sci. Technol., (India)* **11**, 73–5 (1974). The extent of polymerization and resulting losses in polyunsaturated fatty acids, iodine value and *in vitro* digestibility that take place in refined groundnut oil during frying of purees at 180, 220, and 260 C have been investigated. The monomers, dimers and polymers were separated by liquid-liquid partition chromatography on silicic acid. The concentrations of dimeric and polymeric fractions ranged from 11.8–18.6 per cent and 10.0–12.2 per cent respectively during six hours of frying under the conditions used. The percentage decreases in the rates of hydrolysis by pancreatin were 36 at 180 C, 38 at 220 C and 52 at 260 C. Possible causes for decreased enzymic hydrolysis of heated fats are discussed.

Proline as an antioxidant in fish oil. G.D. Revankar (CFTRI Fish Technology Experiment Station, Mangalore, India). *J. Food Sci. Technol., (India)* **11**, 10–11 (1974). Measurement of induction period by the weighing method, and of oxygen uptake, refractive index and TBA and peroxide values at room temperature and at 50 C, all pointed to the antioxidant activity of pure L-proline in fresh sardine oil. At 0.02 per cent level in the oil, proline was an effective as BHA and at 0.1 per cent level it was much more effective than BHA. Adverse color and odor changes at 0.1 per cent level were less noticeable at 0.02 per cent level. Proline is non-toxic and is the first reported antioxidant with a pyrrolidine structure.

Gas-liquid chromatographic determination of vinyl chloride in alcoholic beverages, vegetable oils, and vinegars. D.T. Williams & W.F. Miles (Health Protection Branch, Health and Welfare Canada, Ottawa, Ontario, Canada K1A OL2). *J. Assoc. Off. Anal. Chem.* **58**, 272–5 (1975). Vinyl chloride in foods is determined by gas-liquid chromatography either by direct injection of vinegars and alcoholic beverages or by headspace analysis of vegetable oils. The lower limit of detection is 10 to 15 nanograms per milliliter for direct injection and 5 to 10 parts per billion for headspace analysis. Confirmation by gas chromatography-mass spectrometry, single ion monitoring at m/e 62, is possible at 50 parts per billion for either method. The levels of vinyl chloride found in foods packaged in polyvinyl chloride bottles, were 0.0 to 1.6 micrograms per milliliter, for alcoholic beverages, 0.0 to 8.4 micrograms per milliliter for vinegars, and 0.3 to 3.3 parts per million for peanut oil.

Determination of fat in body tissues and in food mixtures. E.S. Conway and M. Adams (Nutrition Instit., ARS, USDA, Beltsville, MD 20705). *J. Assoc. Off. Anal. Chem.* **58**, 23–7 (1975). The official final action acid hydrolysis method, 14.019, for the determination of fat in foods was successfully applied, with slight modifications, to the analysis of homogenates of food, feces, and animal tissues as well as dry samples of mixed foods. In samples containing sucrose or fructose, it was necessary to carry out a fermentation procedure before acid hydrolysis to avoid problems encountered when these sugars were present.

Examination of oil-soluble colours from foods by solvent partitioning and chromatography. T.S. Banerjee, K.C. Guha, A. Saha and B.R. Roy (Central Food Laboratory, Calcutta, India). *J. Food Sci. Technol., (India)* 11, 230–2 (1974). Fats and oils interfere in the detection of oil-soluble colors in foods by chromatography. The methods of separating fats and oils from colors usually practised are either by alcoholic potash digestion or by silica gel adsorption: both sometimes pose problems in extracting colors fully. In this communication fats and oils and other interfering substances are removed from the colors by a solvent partition technique using dimethyl formamide and hexane (3:1), followed by alumina adsorption. Finally reversed phase paper chromatography detects the colors. This method is rapid and simple and can detect minute quantities of colors in foods.

Effect of thermal oxidation on the fatty acid composition of ghee. B.S. Bector and K.M. Narayanan (National Dairy Res. Institute, Karnal, India). *J. Food Sci. Technol., (India)* 11, 224–6 (1974). Analysis of component fatty acids of heated cow and buffalo ghee by gas-chromatography showed that there was a decrease in 10:1, 14:1, 16:1, 18:1, 18:2, and 18:3 and an increase in 14:0, 16:0, and 18:0 fatty acids. Spectrophotometric estimations by alkali isomerization technique showed that there were significant decreases in the following polyunsaturated fatty acids: dienoic, trienoic, tetraenoic and pentaenoic acids. The losses in the polyunsaturated fatty acids depended upon the degree of unsaturation—the higher the unsaturation, the greater was the loss.

Lipids and fatty acids in foods: quantitative data needed. J.E. Kinsella (Dept. of Food Sci., Cornell Univ., Ithaca, NY 14853). *Food Technol.* (Chicago) 29(2), 22–6 (1975). This article describes the purposes of the Nutrient Data Bank and emphasizes the need for the proper development and reporting of quantitative data on lipids and fatty acids for use in the data bank and in revising and updating Agriculture Handbook No. 8 on composition of foods.

Trace metal analysis of foods by non-flame atomic absorption spectroscopy. B.R. Culver, J.F. Lech, and N.K. Pradhan (Varian Instrument Div., 611 Hansen Way, Palo Alto, CA 94303). *Food Technol.* (Chicago) 29(3), 16–25 (1975). This article discusses three types of sample pretreatment techniques applicable to non-flame atomic absorption spectroscopy for the analysis of trace metals in foods. The techniques are acid hydrolysis, wet ashing with a sulfuric acid-hydrogen peroxide mixture, and dry ashing. A carbon rod atomizer is used as the non-flame atomization source.

Pan release agents and equipment. C.F. Blumm (Mallet & Co., Pittsburgh, PA). *Baker's Dig.* **49**(1), 40–2, 63 (1975). The importance of the depanning operation is pointed out and a description of some available machinery is given. Information is presented on some of the edible lubricants used in release agents. Tables point out the relative smoke points, polymerization tendencies and susceptibility to rancidity of such things as peanut oil, cottonseed oil, corn oil, soybean oil, coconut oil, lard, and mineral oil.

Food-grade emulsifiers. G.E. Petrowski (Carnation Res. Labs., 8015 Van Nuys Blvd., Van Nuys, CA 91412). *Food Technol.* (Chicago) 29(7), 52–62 (1975). This article presents in tabular form the following information for each of approximately 200 food grade emulsifiers: trade name, chemical name, FDA classification, Code of Federal Regulations reference number, % alpha monoglycerides, % total monoglycerides, iodine value, HLB, melting point or pour point, physical characteristics, and name and address of supplier.

A colour reaction for assessing rancidity in coconuts. M.N. Krishna Murthy and N. Chandrasekhara (Central Food Technological Res. Institute, Mysore, India). *J. Food Sci. Technol., (India)* 11, 238–9 (1974). It was found that coconut gives a pink color with hydrochloric acid. The intensity of this color decreased with the development of rancidity as indicated by FFA and carbonyls as well as by organoleptic evaluation. However, the other indices of fat deterioration, such as peroxide value, Kreis value, and TBA value, showed no change.

Study of lipids of the endocarpe of sunflowerseed with a high oil content. T.P. Kalistratova et al. *Pishch. Tekhnol.* **1974**(1), 35–8. Lipids of endocarpe and of sunflowerseed oil have different physical and chemical characteristics. Beside the fatty acids typical for sunflowerseed oil, the lipids of endocarpe also contain saturated fatty acids C_{20} and higher (arachidic, behenic, tricosanoic, and lignoceric). Wax fraction of lipids of endocarpe contains high quantity of unsaturated compounds and free fatty acids which is contrary to the wax fraction of hull lipids. However, hull represents only 2–15% of the total endocarpe and 0.18% of the waxes. (Rev. Fr. Corps Gras)

Influence of volatile fatty acids on the taste and aroma of acidified milk used in the margarine production. A.Z. Ibragimova et al. *Pisch. Tekhnol.* **1974**(1), 63–6. Volatile fatty acids produced by acidified culture used in margarine production are formic, acetic, propionic, and butyric acids. *Str. lactis,* and *Str. cremoris* contribute to the accumulation of acetic acid in the milk until 1.3 mg % g, *Str. diacetilactis* until 9.2 mg % g, and yeast 4–11 mg % g. Addition of citric acid to the milk at the time of acidification provokes an increase of diacetyl and acetic acids. (Rev. Fr. Corps Gras)

Influence of liquid triglycerides contained in fat on the polymorphism. I.V. Nikonov. *Pishch. Tekhnol.* **1974**(3), 20–4. The author studied the mixture of cocoa butter and sunflowerseed oil. Triglycerides of cocoa butter have a melting point from 19.5 C (dioleopalmitin) until 44.5 C (oleodistearin) which puts more than 80% of the total fat in solid state. Sunflowerseed oil has about 70% unsaturated triglycerides, has no solid phase at $t > 0$C, and is a good solvent for triglycerides of cocoa butter. The presence of liquid triglycerides contributes to polymorphism and the formation of more stable modilcations. (Rev. Fr. Corps Gras)

Stability of copper-nickel firm catalysts. A. Abdurahimov et al. *Pishch. Tekhnol.* **1974**(3), 102–4. Catalysts Cu-Ni on the surface previously oxidized are more stable than those on the active surface. Regeneration of Cu-Ni catalyst on the support and on the surface previously oxidized can be accomplished effectively by heating in air. Obtaining one edible hydrogenated fat is possible after poisoning of catalyst Cu-Ni with phosphatide compounds. (Rev. Fr. Corps Gras)

Boiling point of miscella formed from different solvents in function of its concentration. V.V. Beloborodov et al. *Pishch. Tekhnol.* **1974**(3), 151–2. Boiling point of miscella of different concentration, which is important for preliminary distillation, is unequal for different solvents: for solvents with a higher boiling point (n-heptane, turpentine), there is a strong increase of boiling point for a determined concentration of miscella. The boiling point of turpentine miscella for one determined concentration exceeds that of heptane miscella despite the fact that heptane has a higher boiling point than turpentine. (Rev. Fr. Corps Gras)

Vitality and quality of sunflowerseed during storage. V.G. Scerbakov et al. *Pishch. Teknol.* **1974**(5), 15–9. Vitality of seed must be maintained during all time of storage. The post-harvest treatment must be done in the way so that the loss of vitality of seeds is excluded. Chemical conservation of sunflowerseed with propionic acid before postharvest treatment must be considered like the inhibition of oxidation process in the lipids. (Rev. Fr. Corps Gras)

About the quality of sunflowerseed oil during the direct extraction with hexane. L.A. Tarabariceva et al. *Pishch. Tekhnol.* **1974**(5), 62–4. The counter-current, multistage extraction process of sunflowerseed allows obtainment of meal with low oil content. The degree of extraction influences the quality of oil. However, degree of extraction is not one essential factor which determines the quality of oil. The hull content is a more important factor for oil quality. The hull content in the sunflowerseed before extraction can be from 0 till 25% depending if sunflowerseed is dehulled or not and how much hull is left in the material before extraction. (Rev. Fr. Corps Gras)

Influence of some factors on the extraction of cottonseed. R.M. Mirzakarimov et al. *Pishch. Tekhnol.* **1974**(5), 166–7. In the laboratory conditions, the authors solved the problem of multiple stage extraction directly from cottonseed grinded to 45–50%. They considered the following conditions of process as optimals: ratio of height of layer to diameter of column—1:1, hydromodul—1:0.5, temperature of solvent on the sprinkling stages of 11 and 12:55–60 C (which corresponds to the temperature of material 30–35 C), time 240 min, humidity of material 5–6%. (Rev. Fr. Corps Gras)

Transformation of residual fatty acids during the distillation process. W. Zwierzykowski et al. *TSPK Pollena* 18, 89–98 (1974). The influence of the parameters of distillation on the transformation of fatty acids has been studied. The quantitative changes of unsaponifiable matters, hydrocarbons, carbonyl compounds, oxyacids, and polymers were determined during distillation. Distillation has been done in a nitrogen atmosphere, in air, and with aerated and deaerated steam. In all cases, the distillation was conducted in a vacuum. (Rev. Fr. Corps Gras)

Transesterification, in one phase, of binary mixture of liquid oil with high hydrogenated oils. A. Katzer et al. *Tluszcze jadalne* **18**, 165–84 (1974). The production of dietetic margarine is not possible if liquid oil is not used. At the same time, it is necessary to use hydrogenated fat to obtain the desired melting point. The authors find that this procedure is not optimal because margarine has some unfavorable characteristics due to trans fatty acids and also the crystal is unstable. Use of product obtained by transesterification of liquid oil and hydrogenated fat allows the obtaining of a fat phase without trans fatty acids and having a homogeneous structure. The authors studied transesterification of different oils (sunflower, soybean) and high hydrogenated fat (obtained from whale oil, palm oil, rapeseed with low erucic acid content). After transesterification, all products were free of trans fatty acids. The obtained results show that the best transesterified fats are obtained with the following mixture: 20% solid fat and 80% liquid oil; 25% hydrogenated whale oil and 75% sunflowerseed oil; and 25% hydrogenated rapeseed oil and 75% soyabean oil. (Rev. Fr. Corps Gras)

Modification of cell structure of sunflowerseed during thermal drying. C.G. Sherbakov et al. *Maslo-zhir Prom-St.* **1974**(8), 6–8. The study of cell structure of sunflowerseed was done with an electron microscope and has confirmed that lipids in the cells of sunflowerseed are located in the form of spheric inclusions (granules). In the process of thermal drying, the inclusions of lipids and proteins are increased and their protein-lipid membranes partially destroyed. (Rev. Fr. Corps Gras)

Thermal conductivity and density of frying fat during thermal treatment. M.A. Gromov et al. *Maslo-zhir Prom-St.* **1974**(8), 9–10. For the determination of the coefficient of thermal coductivity of vegetable fats and oils as a function of temperature and time of thermal treatment, it is necessary to experimentally establish density of fats at different temperatures and for different periods of thermal treatment. In the paper, the equation for this calculation is given. (Rev. Fr. Corps Gras)

Study of positional isomerisation during hydrogenation with black palladium. A.V. Glebov et al. *Maslo-zhir Prom-St.* **1974**(8), 13–15. A study of the kinetics of positional isomerisation of cottonseed oil on black palladium catalyst at 120–200C, confirms that a migration of double bonds in the oleic acids occurs in a successive order. The authors proposed the corresponding scheme for this process. It was found that the character of the kinetics of the reaction is not modified at higher temperature. (Rev. Fr. Corps Gras)

Use of bone fat in the production of cooking fats. S.G. Liberman et al. *Maslo-zhir Prom-St.* **1974**(8), 15–6. Regarding the technical norms (MRTU 18/135-66), cooking fats are produced from first quality animal fats with the exception of bone fat. The authors studied the use of bone fat for cooking and found that in the formulation of cooking fats, 10–20% can be bone fat instead of beef fat. (Rev. Fr. Corps Gras)

Isomerization of dehydrated castorseed oil under the action of iron pentacarbonyl. P.S. Lescenko et al. *Maslo-zhir Prom-St.* **1974**(8), 18–20. The authors studied isomerization of dehydrated castorseed oil and their methyl esters in the presence of iron pentacarbonyl. The degree of isomerization was 69–72%. In the isomerization process mainly *trans-trans* isomers were formed. The content of non-conjugated linoleic acid decreased from 54% to 15% while the content of conjugated linoleic acid increased from 31% to 70.8%, of which 13.4% are *cis-trans* and 57.4% *trans-trans*. The isomerization has been done at 185 C in an atmosphere of an inert gas. (Rev. Fr. Corps Gras)

Introduction of the condensate of deodorization of hydrogenated soybean oil to the chicken meal. V.S. Morozov et al. *Maslo-zhir Prom-St.* **1974**(8), 35–7. Condensate of deodorization of soybean oil contains an important quantity of tocopherols and sterols, and if this is introduced to the cattle and poultry meal, it would have a favorable influence on the productivity and reproductivity of animals. For the experiments, a condensate rich in tocopherols which was obtained by continuous deodorization of hydrogenated soybean oil, in a De Smet installation, has been used. This condensate added to chicken meal (10 mg of pure vitamin E per kg of meal), increases the egg production by 10.5%. (Rev. Fr. Corps Gras)

Stability of extraction of sunflowerseed flake during the residue elimination of miscella filter. B.M. Sevjakov et al. *Maslo-zhir Prom-St.* **1974**(9), 10–13. A study has been done on stability of the extraction process of sunflowerseed flake in the extractor ND-1250 as a function of different factors connected to the elimination of residues on the miscella filter. It was found that the process of residues elimination from filtration tissue, based on cavitation doesn't disturb the stability of the extraction process. (Rev. Fr. Corps Gras)

• Biochemistry and Nutrition

Chemical structure of soluble lipoproteins of brain. V. Mézešová, H. Ďurdíková, F. Saloň and V. Mézeš (Department of Chemistry and Biochemistry, Comenius University, 03601 Martin) *Collect. Czech. Chem. Commun.* **40**, 1453–60 (1975). The chemical composition of soluble lipoproteins of brain was studied. The ratio of lipids to proteins in the supernatant fraction of brain is 0·03. The quantity of phospholipids and cholesterol in the lipid moiety of supernatant lipoproteins was determined; these two types of lipids accounted for 35% of total supernatant lipids. The presence of mono-, di-, and triglycerides, of free fatty acids and cholesterol esters in the supernatant fraction was established chromatographically; the concentration of these substances is considerably higher than in the lipid extract of the whole brain tissue. Phosphatidylcholines and phosphatidylserines are most abundant among the phospholipids. The presence of residual blood in the tissue was without effect on the results of analyses of proteins, total lipids, and phospholipids yet it partly increased the value of cholesterol in the supernatant fraction of brain.

Dietary-atherosclerosis study on deceased persons. M.C. Moore (Dept. of Pathology, School of Medicine, Louisiana State Univ., New Orleans), M.A. Guzman, P.E. Schilling, and J.P. Strong. *J. Am. Diet. Assoc.* **67**, 22–8 (1975). Interactions of nineteen variables associated with eating and drinking life style as it relates to raised coronary lesions are reported on 456 New Orleans males, ages 20 to 60 years at time of death. Age, race, and occupation were identified statistically as primary correlates of coronary lesions. Frequency of eating meals plus heavy snacks, frequency of intake of caffeine-containing beverages (with and without sucrose), alcoholic beverage consumption, and cigarette smoking rate for the last ten years of life were also correlated with development of atherosclerotic lesions. Sleeping span (hours), food ingestion span, and meal span were other varibles considered in analysis of the data. The authors conclude that not only what is eaten but also how and when it is eaten appear to affect the etiology of atherosclerosis.

A tool for individualized management of fat-controlled diets. C. Jansen, J. Dupont (Dept. of Food Science and Nutrition, Colorado State Univ., Fort Collins, Col.), and G.G. Blaker. *J. Am. Diet. Assoc.* **67**, 28–35 (1975). A procedure which will permit management of fat-controlled diets by individuals following the diets is described. The foods within various major groupings (fats and oils; nuts and legumes; milk, dairy products, and eggs; soups; fruits and vegetables; breads, cereals, and desserts; meats; and fish and shellfish) are further grouped according to increasing fat content and/or increasing saturation. After the individual's habitual diet is analyzed to determine usual intakes of calories; total, polyunsaturated, and saturated fat; and cholesterol, changes in the diet are recommended using the tabulated food groups. Depending on the type of modification desired (e.g., to reduce the different types of hyperlipidemia), various parts of the information may be used as needed. As a result, the dietary guidelines may be met with minimum deviation from individual food preferences.

ANTISTERILITY ACTIVITY OF D-α-TOCOPHERYL HYDROQUINONE IN THE VITAMIN E-DEFICIENT MALE HAMSTER AND RAT. S.I. Mauer and K.E. Mason (Dept. of Anatomy, Univ. of Rochester Sch. of Med. and Dentistry, Rochester, N.Y. 14620) *J. Nutr.* **105**, 491–4 (1975). A previous study (J. Nutr. 105, 484–90) described a testicular degeneration in the vitamin E-deficient Syrian hamster which, unlike that in the vitamin E-deficient rat, was effectively repaired by d-α-tocopherol. In the present study male hamsters were reared from weaning on vitamin E-deficient diets, one high and one low in added fats, for 90 to 100 days prior to surgical ablation of one testis. All testes were much reduced in weight and, histologically, showed advanced degenerative changes. Maintenance on the same diet, with daily oral supplements of 10 mg of d-α-tocopheryl acetate or 25 mg of d-α-tocopheryl hydroquinone for periods of 20 to 30 days, resulted in marked increases in testis weight and remarkable repair of the germinal epithelium, histologically. It is concluded that d-α-tocopheryl hydroquinone, in addition to previously demonstrated antidystrophic properties, has antisterility activity in the vitamin E-deficient male hamster and rat approximating one-fifth that of d-α-tocopherol.

CARBOHYDRATE AND LIPID METABOLISM IN THE ALASKAN ARCTIC ESKIMO. S.A. Feldman, A.H. Rubenstein, K. Ho, C.B. Taylor, L.A. Lewis, and B. Mikkelson (Depts. of Path., VA Res. Hospital and Northwestern Univ., Chicago, Ill.) *Am. J. Clin. Nutr.* **28**, 588–94 (1975). The effect of a low total carbohydrate low sucrose diet on various parameters of lipid and carbohydrate metabolism was studied among residents of a North Slope Alaskan Eskimo village. For comparative purposes a group of Eskimo youths consuming a higher carbohydrate institutional diet was also studied. Those Eskimos consuming their native diet had unusually low serum triglycerides and very low density lipoproteins and normal glucose and tolbutamide tolerance test. Eskimos on a higher carbohydrate diet exhibited significant elevations of triglycerides and minor alterations in glucose tolerance testing. Differences in cholesterol intake between these groups were accompanied by changes in serum cholesterol and low density lipoprotein levels. Unusually high levels of free fatty acids without ketonemia in the North Slope sample were noted as well.

DIETARY AND HORMONAL EFFECTS UPON ACTIVITY OF "SOLUBLE" PROTEIN AND PARTICULATE FRACTION OF FATTY ACID DESATURATION SYSTEM OF RAT LIVER MICROSOMES. A.M. Nervi, A. Catala, R.R. Brenner and R.O. Peluffo (Cátedra de Bioqûimica, Instituto de Fisiología, Facultad de Ciencia de la Salud, Univ. Nacional de La Plata, La Plata, Argentina) *Lipids* **10**, 348–52 (1975). Rat liver microsomes were extracted with a buffered 0.15 M KCl and 0.25 M sucrose solution and fractionated by centrifugation into a particulate component and a supernatant containing a protein factor necessary for fatty acid desaturation. The Δ6 fatty acid desaturation activity of the extracted microsomes was reduced significantly, and the readdition of the supernatant restored the enzymatic activity to the original value of the whole microsomes. A protein diet or a fat-free diet increased the Δ6 desaturation activity of the whole microsomes. The activating effect was evoked upon the particulate components of the enzymatic desaturation system and not upon the protein factor present in the supernatant. Fasting, refeeding, and refeeding plus glucagon and theophylline treatments of rats also modified the Δ6 desaturation activity of whole liver microsomes. The effect also was evoked on the Δ6 desaturation system tightly bound to the microsomal membrane but not on the protein factor of the supernatant. Accordingly, the protein factor of the supernatant is considered to be different from the cyanide sensitive factor and the desaturase.

EFFECT OF ACUTE DIETARY ALTERATION UPON INTESTINAL LIPID SYNTHESIS. C.M. Mansbach, II, (Veterans Admin. Hospital, Dept. of Med., Division of Gastroenterology, Duke Univ. Med. Center, Durham, N. Carolina 27710) *Lipids* **10**, 318–21 (1975). The specific activities of three enzymes engaged in complex lipid synthesis, diglyceride acyltransferase, cholinephosphotransferase, and lysolecithin acyltransferase were studied in intestinal mucosa of hamsters fed either saline, hydrolyzed casein, or corn oil for 9½ hr. In the most proximal intestine, saline feeding was associated with a reduced specific activity in villous tips with all three enzymes studied when compared with the two caloric supplemented groups. In the most distal intestine, oil feeding increased the activity of lysolecithin acyltransferase and choline phosphotransferase twofold as compared to casein fed hamsters; diglyceride acyltransferase was increased one- and one-half-fold. The response of lysolecithin acyltransferase and diglyceride acyltransferase to fat feeding was incomplete when compared to hamsters fed a fat supplemented diet for 7 days, suggesting that their pattern of response to dietary substrate was similar to the disaccharidases. By contrast, the response of cholinephosphotransferase to fat feeding was complete at 24 hr, suggesting that it responds in a manner similar to the glycolytic enzymes.

ERUCIC ACID METABOLISM BY RAT HEART PREPARATIONS. C. Cheng and S.V. Pande (Lab. of Intermediary Metabolism, Clinical Res. Instit. of Montreal, Montreal, Quebec, Cana. H2W 1R7) *Lipids* **10**, 335–9 (1975). Rat heart preparations metabolized erucic acid at much slower rates than palmitic acid. This applied for activation reaction, for the conversion of acyl-CoA to acylcarnitine, and for the utilization of acyl group for oxidation. As compared to palmityl-CoA, erucyl-CoA exhibited a lower affinity for carnitine palmityltransferase (EC 2.3.1.23), the respective apparent Michaelis constants were 43 and 83 μM. Presence of erucyl-CoA or erucylcarnitine slowed the mitochondrial oxidation of palmityl groups apparently because of the slower oxidation of erucyl groups. However, presence of erucate did not inhibit the activation of palmitate. Heart mitochondria obtained from rats fed rapeseed oil (50 cal%) or corn oil diet for 3 days showed similar abilities for the coupled oxidation of various substrates and similar carnitine palmityltransferase activities. Thus, a suggestion of gross mitochondrial malfunction following rapeseed oil consumption was not confirmed.

FACTORS AFFECTING THE REASSOCIATION AND REACTIVATION OF THE HALF-MOLECULAR WEIGHT NONIDENTICAL SUBUNITS OF PIGEON LIVER FATTY ACID SYNTHETASE. R.A. Muesing, F.A. Lornitzo, S. Kumar and J.W. Porter (Lipid Metabolism Lab., Vet. Admin. Hosp., and Dept. of Physiol. Chem., Univ. of Wis., Madison, Wis. 53706) *J. Biol. Chem.* **250**, 1814–23 (1975). The pigeon liver fatty acid synthetase complex (14 S) is dissociated in low ionic strength buffer containing dithiothreitol to form half-molecular weight subunits (9 S) which are completely inactive for the synthesis of saturated fatty acids. The dithiothreitol-protected (reduced) subunits are rapidly reassociated and reactivated to form the active enzyme complex, not only by an increase in salt concentration but also by micromolar concentrations of $NADP^+$ or NADPH. Increases in KCL or NADPH concentration result in an increase in the extent of reactivation (equilibrium) with no change in the over-all rate of the reaction or the half-life of reactivation of the enzyme. The rate of reactivation of enzyme in the presence of KCl or NADPH conforms to first order kinetics. This result suggests that the subunits first combine to form an inactive complex which is subsequently transformed to an enzymatically active complex. Under these conditions the amount of complex observed upon ultracentrifugation was greater than expected from determinations of enzyme activity.

IDENTIFICATION AND QUANTITATION OF CHOLANOIC ACIDS IN HEPATIC AND EXTRA-HEPATIC TISSUES OF RAT. Suk Yon Oh and J. Dupont (Dept. of Food Sci. and Nutr., Colorado St. Univ., Fort Collins, Colorado 80523) *Lipids* **10**, 340–7 (1975). Tissues of rats were examined for the presence of cholanoic acids. Quantitation of extraction, deconjugation, and isolation were verified by use of radioactive standards. Identification was made by thin layer and gas liquid chromatographic comparison to standards and mass spectrometry. All tissues examined were found to contain several conjugated cholanoic acids. Liver contained primarily cholic acid and peripheral tissues primarily dihydroxy compounds, mainly hyodeoxycholic acid.

NONSTEROIDAL SECONDARY AND TERTIARY AMINES: INHIBITORS OF INSECT DEVELOPMENT AND METAMORPHOSIS AND Δ^{24}-STEROL REDUCTASE SYSTEM OF TOBACCO HORNWORM. W.E. Robbins, M.J. Thompson, J.A. Svoboda, T.J. Shortino, C.F. Cohen, S.R. Dutky and O.J. Duncan, III (Insect Physiology Lab., Beltsville, Md. 20705) *Lipids* **10**, 353–9 (1975). Several new branched and straight chain secondary and tertiary amines were shown to have inhibitive effects upon development and

(Continued on page 571A)

• **Abstracts** . . . . (Continued from page 570A)

metamorphosis and the Δ^{24}-sterol reductase system in larvae of the tobacco hornworm similar to those previously observed with a number of azasteroids. Certain of the amines which are related structurally to compounds with juvenile hormone activity in insects also blocked development and metamorphosis in three other species of insects. These compounds are lethal or inhibit development in all larval stages and thus differ in action from compounds with juvenile hormone activity where the principal effect is to block the penultimate or ultimate molt.

Quantification of plasma cholesterol and triglyceride levels in hypercholesterolemic subjects receiving ascorbic acid supplements. V.E. Peterson, P.A. Crapo, J. Weininger, H. Ginsberg and J. Olefsky (Dept. of Med., Division of Metabolism, Stanford Univ. Med. Cntr., Stanford, California 94305) *Am. J. Clin. Nutr.* **28**, 584–7 (1975). In order to assess the possible effects of ascorbic acid on plasma cholesterol and triglyceride levels and plasma lipoprotein composition, nine hypercholesterolemic subjects were treated with oral ascorbic acid (4 g/day) for 2 months. The data demonstrate: 1) no significant change in plasma cholesterol or triglyceride levels; 2) no significant change in the cholesterol or triglyceride concentrations of the major lipoprotein classes; and 3) the unexpected appearance of extra pre-β bands of lipoprotein electrophoresis by the end of the ascorbic acid treatment period.

Adaptive changes in Δ9 desaturase activity in rat liver. M.E. DeTomas, O. Mercuri and R. Peluffo *Lipids* **10**, 360–2 (1975). The Δ9 desaturase activity and the ^{14}C radioactivity of the de novo synthesized fatty acids incorporated into microsomal lipids and serum triglycerides were measured under different nutritional conditions. The results obtained indicate a correlation between the values of the three parameters studied after starvation or after refeeding Purina chow or either a high carbohydrate or a high protein diet. These data suggest that liver lipogenesis and Δ9 desaturase activities respond to the same regulatory factors.

Specificity of the effect of dietary cholesterol on rat liver microsomal 3-hydroxy-3-methylglutaryl-coenzyme A reductase activity. K.W. Gregory and R. Booth (Dept. of Biochem., Med. Sci. Instit., Univ. of Dundee, Dundee DD1 4HN, U.K.) *Biochem. J.* **148**, 337–9 (1975). Dietary cholesterol lowers the activity of rat liver microsomal 3-hydroxy-3-methylglutaryl-CoA reductase without affecting various other liver microsomal enzymes. This is consistent with a specific regulatory mechanism and distinguishes the action of cholesterol on 3-hydroxy-3-methylglutaryl-CoA reductase from that of at least one other stimulus known to affect this enzyme.

Surface carbohydrates of hamster fibroblasts. I. Chemical characterization of surface-labeled glycosphingolipids and a specific ceramide tetrasaccharide for transformants. C.G. Gahmberg and S. Hakomori (Depts. of Pathobiol. and microbiol., Sch. of Public Health and Sch. of Med., Univ. of Wa., and Division of Biochemical Oncology, Fred Hutchinson Cancer Res. Center, Seattle, Wa. 98195) *J. Biol. Chem.* **250**, 2438–46 (1975). Neutral glycosphingolipids of hamster fibroblast NIL cells have been characterized as follows: glucosylceramide, lactosylceramide (βGal1 → 4Glc → Cer), a digalactosylceramide (αGal1 → 4βGal1 → Cer), a trihexosylceramide (αGal1 → 4βGal1 → 4Glc → Cer), two kinds of ceramide tetrasaccharides (A: αGalNAc1 → 3βGalNAc1 → 3αGal1 → 4βGal1 → 1Cer, a new type of Forssman active glycolipid; B: globoside, βGalNAc1 → 3αGal1 → 4βGal1 → 4βGlc → Cer), and a ceramide pentasaccharide having a classical structure for Forssman antigen (αGalNAc1 → 3βGalNAc1 → 3αGal1 → 4βGal1 → 4Glc → Cer). Neutral glycosphingolipids of polyoma virus-transformed NIL cells (NILpy) have been characterized as having an additional ceramide tetrasaccharide which was absent in normal NIL cells. Chemical quantities of ceramide tetra- and pentasaccharides in NILpy cells were much lower than in NIL cells. The surface label in glycolipids was cell cycle-dependent in NIL cells, and a remarkable exposure of a galactosyl residue of a ceramide tetrasaccharide was demonstrated only on the surface of NILpy cells, due to the presence of lacto-*N*-neotetraosylceramide.

The kinetic characteristics of inhibition of hepatic cholesterogenesis of lipoproteins of intestinal origin. F.O. Nervi, H.J. Weis and J.M. Dietschy (Gastrointestinal-Liver Section of the Dept. of Med., The Univ. of Tex. Health Sci. Ctr. at Dallas, Dallas, Tx. 75235) *J. Biol. Chem.* **250**, 4145–51 (1975). In these studies intestinal lipoproteins were injected intravenously into recipient rats in order to study the kinetic characteristics of cholesterol uptake by the liver cell and inhibition of the cholesterol synthetic pathway. Net cholesterol uptake from circulating intestinal lipoproteins took place only in the liver, and only this tissue manifested inhibition of cholesterol synthesis. Cholesterol uptake by the liver, quantified by a rise in the cholesterol ester content, was a linear function of time and of the amount of lipoprotein cholesterol administered to the animals. Using groups of rats that were either fed cholesterol or injected intravenously with intestinal lipoproteins as a bolus or as a continuous infusion, there was generally a correlation between inhibition of the rate of cholesterol synthesis and the cholesterol ester content of the liver. However, there was no consistent quantitative relationship between these two variables suggesting either that cholesterol ester was not the immediate effector of the inhibition or, alternatively, that there was intracellular localization of the effector at the site of control of the rate-limiting enzyme in the cholesterogenic pathway.

Visual membranes: specificity of fatty acid precursors for the electrical response to illumination. T.G. Wheeler, R.M. Benolken and R.E. Anderson (Grad. Sch. of Biomedical Sci., University of Tx., Houston, Tx. 77025) *Science* **188**, 1312–4 (1975). Rat electroretinograms were measured as a function of dietary supplements of purified ethyl esters of linolenic acid, linoleic acid and oleic acid. Polyunsaturated fatty acids derived from precursors of linolenic and linoleic acids appear to be important functional components of photoreceptor cell membranes, although in equal dietary concentrations, linolenic acid precursors affect electroretinogram amplitudes to a greater extent than linoleic acid precursors. The electrical response of photoreceptor cell membranes appears to be a function of the position of the double bonds as well as a function of the total number of double bonds in fatty acid supplements.

• Edible Proteins

Production of protein concentrate using air classification. R.B. Swain and D.E. O'Connor (Procter & Gamble). *U.S. 3,895,003.* The process comprises the steps of (a) fine grinding an oilseed meal so that 90% of the particles are less than 100 microns in size; (b) air classifying the ground meal to produce a first fines fraction and a first coarse fraction. The first fines fraction, comprising 60–90% of the ground meal and 90% of whose particles are less than 45 microns in size, is removed; (c) ultra-finely grinding the first fines fraction so that 90% of the particles are less than 20 microns in diameter; (d) air classifying the ground first fines fraction to produce a second fines fraction and a second coarse fraction, comprising 50–90% of the ground first fines fraction and 80% of whose particles are less than 20 microns in diameter; and (e) washing the second coarse fraction with a solution selected from the group consisting of water at pH 4–6 and a 20–80% aqueous alcoholic solution and separating a protein-containing residue from a liquid supernatant.

Soft textured dry protein product. R.J. Baker, T.A. Miller, G.K. Erlinger, S.F. Loepiktie and L.R. Hanselman (Ralston Purina Co.). *U.S. 3,891,774.* A method of treating a protein-containing vegetable material to form a soft, dry, textured, expanded food product comprises the steps of (1) starting with a protein source containing 30–75% protein and selected from oilseed meals, animal, fish, and poultry by-product meals, and microbial protein; (2) mixing an organic plasticizing solvent such as glycerol or propylene glycol at levels of 10–50%; (3) heating the mixture to above 212 F while applying pressure to make the material flowable; (4) forcing the heated, worked material through a first orifice with no pressure drop; and (4) forcing the material through a second orifice into a lower pressure zone. Following emersion from the extruder, the material expands and loses moisture. The resultant product contains 3–7% moisture.

Protein foods—flavors and off-flavors. A.E. Goossens (Dir., Flavor Res., Miles Labs, Inc., Elkhart, Ind.). *Food Eng.* **46**(10), 59–60 (1974). Protein foods are a real challenge to the creative flavorist. He must consider the off-flavors in the raw materials, those which may be developed in processing, plus those imparted by added flavors and by flavor decomposition. To develop a flavor for a vegetable protein food that imparts a flavor profile equal to its natural counterpart, he will have to tailor-make the flavor for each application.

Retention of water and fat in cooked patties of beef and of beef extended with textured vegetable protein. R.H. Anderson, and K.D. Lind (General Mills Technical Ctr., 9000 Plymouth Ave. North, Minneapolis, Minn. 55427). *Food Technol.* (Chicago) 29(2), 44–45 (1975). The authors report results of experiments which show that regardless of fat and moisture levels of raw patties, those composed of a mixture of 25% by weight of hydrated textured protein in beef retain a greater percentage of moisture and a lesser percentage of fat after cooking than all-beef patties of comparable fat levels.

Possibility of concentrated proteide production from sunflowerseed for food products. I. Studies to obtain a product with a minimum cellulose content. I. Marincevski et al. *Maslo-sapuneg Prom.* 11, 16–32 (1974). Laboratory experiments have been done to study the possibility of obtaining a product, isolated from sunflowerseed, with a high protein content. A series of proteide products were obtained. The content of protein was 62.5, 71.1, 72.4, 95.7, and 96%. The physical-chemical characteristics of these products and the conditions of production are given in the paper. (Rev. Fr. Corps Gras)

• Drying Oils and Paints

Manufacture of polyol esters of carboxylic acids. H. Isa, T. Inagaki, Y. Kiyonaga, and M. Nagayama (Lion fat & Oil Co.). *U.S. 3,891,683.* A first catalyst of cobalt, nickel, or rhodium and a second catalyst of pyridine, alkylated pyridine, or vinyl pyridine are contacted with carbon monoxide and an olefin having 3–30 carbon atoms at 90–250 C and 60–300 kg/cm^2 to obtain a pretreated catalyst composition. The polyhydric alcohol is than added to the reaction mixture and the esterification completed.

Cross-linkable polyamides derived from polymeric fat acids. J.E. Billigmeier, A.L. Melby, D.E. Peerman, and R.R. Roesler (General Mills, Inc.). *U.S. 3,892,785.* The polyamide is derived from a linear diamine-polymeric fatty acid based polyamide. The polymeric fatty acid comprises at least 25 equivalent per cent of the total carboxyl groups and at least 85% dimeric fatty acid. The polyamide contains sufficient $-CH_2-O-R$ groups as replacement for amide hydrogens of the linear polyamide to render it cross-linkable.

Alkyd resins modified with acrylic or methacrylic acid for use in water based paints. G. Montesissa, A. Olivieri and G. Scapellato (Duco S.p.A.). *U.S. 3,894,978.* Water soluble and water dispersible alkyd resins comprise the product of the reaction between (a) the resinous product, substantially free of polyacrylic acid, obtained by reatcing glacial acrylic or methacrylic acid with at least one polyunsaturated monocarboxylic fatty acid or esters thereof with a polyvalent alcohol under conditions such that the ratio between the unreacted glacial acrylic or methacrylic acid and the acrylic or methacrylic acid combined with the fatty acid or ester is between 0.1 and 1; (b) a polyvalent alcohol; and optionally (c) a compound capable of reacting with the product of (a) and (b) and selected from the group consisting of saturated and unsaturated monocarboxylic acids, saturated and unsaturated dicarboxylic acids, siccative and nonsiccative oils. The ratio of (a) to (b) is between 1:9 and 9:1. If present, the amount of (c) does not exceed 60% of the total weight of components (a) + (b) + (c).

Alkyl resin containing an oligomer mixture of unsaturated long chain fatty acids. R.E. Layman (American Cyanamid Co.). *U.S. 3,893,959.* A hydrolytically stable alkyd resin which can be rendered water dispersible comprises the esterification reaction product of (a) a mixture of (1) 40–82% of at least one aromatic dicarboxylic acid, (2) 5–20% of at least one aromatic tricarboxylic acid, (3) 10–20% of an oligomer mixture of unsaturated long chain fatty acids, and (4) 0–20% of at least one aliphatic dicarboxylic acid, and (b) a mixture of (1) 90–50% of at least one hindered diol free of any carboxyl groups, (2) 0–25% of at least one hindered diol containing a tertiary carboxyl group, and (3) 0–25% of at least one unhindered diol or at least one polyhydric alcohol having at least three alcoholic hydroxy groups.

Analysis of polyurethane resins: a co-operative IUPAC study. L.A. O'Neill (Paint Res. Assn., Waldegrave Road, Teddington, Middlesex TW11 8LD, England) and G. Christensen. *J. Oil Colour Chem. Assoc.* 58, 178–82 (1975). In order to assist the selection of the appropriate techniques for the analysis of modern synthetic resins, a co-operative exercise was carried out by five European laboratories, requiring the analysis of four polyurethane resins of undisclosed compositions using techniques chosen at their discretion. The results showed that there were satisfactory techniques for identifying the isocyanates, polyol and fatty acid components (provided these were not changed during manufacture of the resin) and estimating the phthalic and isocyanate content of urethane alkyds.

Some aspects of the industrial application of the Egyptian rice germ oil in the field of surface coatings. Part I: Separation and modification of rice germ wax. A.M. Naser (Chem. Dept., Faculty of Sci., Al-Azhar Univ., Nasr City, Cairo, Egypt), M.A. El-Azmirly and A.Z. Gomaa. *J. Oil Colour Chem. Assoc.* 58, 131–4 (1975). Egyptian rice germ oil, produced by solvent extraction of the rice germ, is of minor industrial importance and is characterized by relatively high contents of wax and saturated matter. Separation of the crude wax using different methods and modifying the wax properties (softening point and hardness) are discussed.

Some aspects of the industrial application of the Egyptian rice germ oil in the field of surface coatings. Part II: Preparation and evaluation of rice germ and rice germ/linseed oil alkyds. A.M. Naser (Chem. Dept., Faculty of Sci., Al-Azhar Univ., Nasr City, Cairo, Egypt), M.A. El-Azmirly and A.Z. Gomaa. *J. Oil Colour Chem. Assoc.* 58, 135–40 (1975). Three alkyds with different oil lengths have been prepared from rice germ oil. Replacement of part of the rice germ oil by linseed oil has also been investigated. It is observed that only short rice germ alkyds are air drying, while medium and long rice germ alkyds dry only upon stoving at 90 C for three hours after addition of suitable driers. This behavior is also true for rice germ/linseed oil alkyds. Replacement of part of the rice germ oil by the drying oil leads to an improvement in the drying characteristics and better film performance of the finished alkyds relative to those made from rice germ oil alone.

Gas chromatographic analysis of the carboxylic acid components of alkyd resins. W. Mazurek and G.C. Smith (Australian Defense Scientific Service, Defense Stds. Labs., Maribyrnong, Victoria, Australia). *J. Oil Colour Chem. Assoc.* 57, 179–83 (1974). Methyl esters formed from the reaction of the transesterifying reagents hydrogen chloride/methanol, boron trifluoride/methanol and lithium methoxide/methanol with alkyd resins have been analyzed by gas chromatography. Satisfactory separation of the components has been achieved by the use of two complimentary columns containing DEGS and Carbowax 20M as the liquid phases. None of the 3 reagents used was entirely satisfactory for quantitative determination of the phthalic acid content of alkyd resins. However, the fatty acid determinations were more reliable and the vegetable oils used in the manufacture of the resins could be easily characterized.

• Detergents

Study on antimicrobial surface agent. III. Morphological bacteria. T. Uchibori, M. Takahashi, I. Yamamoto and S. Watanabe. *Yukagaku* 24, 116–20 (1975). Cationic, anionic or nonionic surfactant was added to the suspensions of *E. coli* in physiological solution of sodium chloride and transmittance of the suspension was determined at 560 mμ. With the cationics which exhibited a marked antibacterial activity, the transmittance decreased significantly as the concentration of the surfactant increased from 6.25 μg/ml to 100 μg/ml. The transmittance of the suspensions containing anionics of 100 μg/ml was the same as that of the control suspension containing no surfactant, and the transmittance of the suspension containing cationics showed the lowest. The suspension of *E. coli* treated with the surfactant was centrifuged in a refrigerated centrifuge to prepare the specimens for an electron microscope observation. According to figures of the electron microscopy, it was found that the cell, especially cell wall and protoplasm, suffered considerable changes such as swelling of cell, disappearance of undulation and bleb formation in cell wall, decrease or granular aggregation of ribosomes, or formation of lamellar structure in the plasma membrane.

Preparation and surface activities of salts of long chain alkylbenzoic acids. C. Kimura and K. Kashiwaya. *Yukagaku* 24, 121–6 (1975). Dodecyl and tetradecylbenzoic acids were prepared by oxidation of the corresponding alkylacetophenones derived from acetylation of alkylbenzenes. These acids were neutralized with various bases including alkali metal hydroxides and aminoalcohols such as 2-aminoethanol, 2-amino-2-methyl-1-propanol, 2-amino-2-methyl-1,3-propanediol, tris(hydroxymethyl)-aminomethane and triethanolamine. Surface activities of these salts were determined and compared with each other. These salts showed excellent lowering of surface tension, except triethanolamine and tris(hydroxymethyl)-aminomethane salts. Most organic salts had larger value of cmc than inorganic salts. 2-Aminoethanol salts of both acids and 2-amino-2-methyl-1-propanol salt of dodecylbenzoic acid showed excellent emulsifying power for benzene, and for kerosene 2-aminoethanol and 2-amino-2-methyl-1-propanol salts of the acids proved to be better emulsifier than the other salts, but all of these salts emulsified moderately soy-bean oil as well as DBS (sodium dodecylbenzenesulfonate). 2-Aminoethanol salt and potassium salt of dodecylbenzoic acid showed better wettability than other salts, but inferior to DBS. Foaming properties of these salts were found not good.

Studies on the analysis of surface active agent. XXXIII. Determination of micromoisture in surfactants by near-infrared spectroscopy. Y. Kasi, W. Yano and W. Kimura. *Yukagaku* 24, 27–30 (1975). A rapid method for the determination of micromoisture in surfactants by near-infrared spectroscopy was reported. Using carbontetrachloride-DMSO (3:1, vol/vol) as the solvent, water has strong absorption at 1.94 μ in the near-infrared region. The linear relationship is obtained between the absorbance value at 1.94 μ and water content. The results show that the micromoisture of various surfactants can be determined rapidly and with accuracy (deviation 2.1%) by this method. The concentration of detection limit was 1 mg in 50 ml sample soln.

Dibasic acids containing ether linkages. IV. Detergency building action. II. Oxa-, aza-, hydrazino- and 2-hydroxyethyliminodicarboxylic acids. Y. Abe, S. Matsumura, T. Shirahata, T. Miura and A. Mochizuki. *Yukagaku* 24, 31–5 (1975). The disodium salts of azadiacetic, azadipropionic, thiodiglycolic, thiodipropionic, hydrazinodiacetic, hydrazinodipropionic, 2-hydroxyethyliminodiacetic and 2-hydroxyethyliminodipropionic acids were prepared and their building performances were compared with disodium oxadiacetate and sodium tripolyphosphate (STPP) using alkylbenzene sulfonate. The detergency tests were carried out on naturally soiled cotton fabrics and the detergency powers were evaluated by Scheffe's method. The results show that disodium salt of 2-hydroxyethyliminodiacetic acid with alkylbenzenesulfonate is as well active as STPP. In the case of dibasic acids containing imino or thio-ether groups, diacetates are more active than di-β-propionates as in the case of oxadicarboxylates. These orders of activities are generally paralleled with those of stabilities of the chelates. The detersive effect of the dicarboxylates decreases as in the following order: oxadicarboxylate > azadicarboxylate > thiodicarboxylate.

A correlation between adsorption of surfactant onto callus and skin-roughness caused by surfactant. G. Imokawa, K. Sumura and M. Katsumi. *Yukagaku* 23, 719–25 (1974). The adsorption of typical anionic surfactants onto callus obtained from the instep as a representative of epidermal keratin of human skin was investigated. The results indicated that the amounts of surfactant adsorbed by callus have the tendency to decrease in the following order; alkylsulfate > alkylbenzene sulfonate > alfaolefin sulfonate > alkyl polyoxyethylene sulfate. Moreover the amounts of adsorption were examined in relation to the intensities of skin-roughness caused *in vivo* by the same surfactants of various series and it was found that there is a good correlation between the amounts of adsorption of surfactant onto callus and the intensities of skin-roughness. These facts suggested that the adsorption of surfactant on skin may play an important role in roughening the skin.

Studies of ester-containing surfactant. Effect of urea on the micelle formation. T. Hikota and K. Meguro. *Yukagagu* 23, 560–2 (1974). The critical micelle concentration (cmc) of sodium sulfoalkyl alkanoates C_nH_{2n+1}-$COO(CH_2)_mSO_3Na$ (n = 9, 10 and 11; m = 2, 3 and 4) in aqueous urea solution have been determined by the spectral change of pinacyanol chloride. The rate of increase in these cmc values due to the addition of urea increased with the number of carbon atoms inserted between the ester group and the sulfonate group, but decreased with increasing number of carbon atoms in the fatty acid portion of surfactant molecule. Accordingly, among the surfactants containing a given number of carbon atoms in the hydrocarbon chain, the farther the ester group moves from the terminal group to the center of the molecule, the increment in cmc value becomes larger.

Biodegradation of α-olefin sulfonates (AOS) and other surfactants. H. Sekiguchi, K. Miura, K. Oba and A. Mori (Lion Fat and Oil Co., Ltd., 7-13-12 Hirai, Edogawa-ku, Tokyo). *Yukagaku* 24, 145–8 (1975). Sodium α-olefin sulfonates (AOS) and other ten anionic and three nonionic surfactants were taken as test materials. In the shake culture test method, it was found that surfactants containing straight alkyl chain such as AOS, alcohol sulfate and soap were degraded in shorter period necessary for the disappearance of the carbonaceous materials during biodegradation. However, surfactants having benzene ring or ethoxylate chain in their molecules were slow in decrease of the concentration of organic carbon during biodegradation, and there was a large discrepancy between the biodegradation rates obtained by colorimetric analysis and measurement of organic carbon.

Study on dihydric alcohol containing ether linkage. III. Triesters as plasticizers for polyvinyl chloride. K. Kawada, T. Isobe and S. Watanabe (Department of Chemistry, Faculty of Hygienic Sciences, Kitasato University, 1, Asamizodai, Sagamihara-shi). *Yukagaku* 24, 253–6 (1975). Triesters containing an ether linkage were synthesized and their utilization as plasticizer was examined. Some monoesters were obtained from 1-chloro-3-(2-hydroxyethoxy)-propanol-2 and potassium hexanoate, octanoate, decanoate, laurate, myristate, palmitate or stearate and then they were acylated with acetyl, benzoyl or n-hexanoyl chloride to yield triesters, including diacetates, dibenzoates and dihexanoates, respectively. The triesters were evaluated on the plasticizing effect, through comparison of the effects on the properties of polyvinyl chloride (PVC), with those of dioctyl phthalate (DOP). PVC containing diacetates were considerably inferior than the control (containing only DOP) only in heat stability. With dibenzoates, heat stability was appreciably improved, however, low temperature flexibility lowered. On the other hand, PVC containing dihexanoates showed almost the same degree of heat stability as the control did and were superior than the control in low temperature flexibility. The number of carbon atoms contained in the fatty acid molecules used did not appreciably influence the plasticizing effect.

Gas chromatographic analysis of alkane sulfonates by forming mercapto derivatives. T. Ishii, K. Yamane, H. Kato and K. Kunihiro (Householdproducts Research Laboratories, KAO SOAP Co., Ltd., 1–3, 2-Chome, Bunka, Sumida-ku, Tokyo). *Yukagaku* 24, 229–32 (1975). The carbon chain distribution of lipophilic group of alkane sulfonate was determined by gas chromatography in the form of mercapto derivative. At first, alkane sulfonate is converted to corresponding sulfonyl chloride by the reaction with thionyl chloride, and reduced to mercapto derivative by hydrochloric acid-zinc powder. This derivative is steam-distilled and extracted with dichloromethane for gas chromatographic analysis. The peaks obtained by GC using OV-17 are very sharp and separated enough to determine the carbon chain distribution. The relative ratio of peak area corresponds to original carbon chain distribution. The position isomers of alkane sulfonate are well-separated by using a capillary column. Improvement of reproducibility and accuracy was accomplished, and this method was applied to commercial sodium alkane sulfonate.

The selection of emulsifier in w/o type emulsions by HLB-temperature (PIT) system. H. Sagitani and K. Shinoda (Department of Chemistry, Yokohama National University, Ooda, Minami-ku, Yokoham). *Yukagaku* 24, 171-5 (1975). The dissolution state of polyoxyethylene (*n*) nonylphenylether-water-cyclohexane system was studied as a function of temperature. The phase inversion temperature (PIT) and the temperature range over which W/O type emulsions are stable were determined. As a result, the relation between the PIT and the oxyethylene chain length of emulsifiers which will give the stable W/O type emulsions was obtained, thereby an emulsifer which will yield stable emulsion at a given temperature can be selected. Emulsions are more stable, if we select emulsifiers whose oxyethylene chain length is shorter by about two as compared with the emulsifier whose PIT (HLB-temperature) is equal to an experimental temperature. Thus, the procedures for the emulsifier selection of W/O type became clear by HLB-temperature method.

Recent progress in the processing of toilet soap. L.J. Monticelli, (Soc. G. Mazzoni S.p.A.). *Seifen-Öle-Fette-Wachse* 101(8), 203–6 (1975). The soap industry and particularly, the production of toilet and face soap have made considerable progress in recent years, with the development meeting various special wishes of the public. For this reason, a variety of compositions and appearances is demanded. Processes have therefore been developed which permit production at reasonable prices as well as meeting special demands. The production of special soaps is described, such as pieces of soap with a complicated composition, multi-colored soap, soap on a cord or soap with delicate shapes, small pieces of soap and hotel soaps.

Effect of some cationic detergents on an oil/water emulsion stabilized by sodium lauryl sulfate. P. Bahadur and S.N. Srivastava (Chem. Dept., Agra College, Agra, India). *Colloid Polym. Sci.* 253(4), 315–21 (1975). A petroleum ether-in-water emulsion stabilized by sodium lauryl sulfate, an anionic surfactant was studied and its stability has been examined in the light of D.L.V.O. theory by adding some cationic detergents with different carbon chain lengths and head group size. Flocculation studies were made haemocytometrically and the values were correlated with zeta potentials which were determined microelectrophoretically. From the values of zeta-potential, the energy curves, binding parameters, charge densities, operating value of Hamaker constant for the system etc. have been calculated. Both the rates of coalescence and flocculation were measured separately in order to study the kinetics of coagulation of the system.

The aggregation of heavy metal soaps in non-aqueous solvents. J.A. Wood and C.P. Rycroft (Dept. Applied Chem. and Biological Sciences. The Polytechnic, Huddersfield, England). *Colloid Polym. Sci.* 253(4), 311–4 (1975). Vapor pressure osmometry has been used to determine the molecular weight of chromium myristate, palmitate and stearate in toluene at 37C. Results indicate the formation of dimeric species above a critical concentration.

The structure of the interface layer in silver iodide/tenside systems. R. Despotovic, N. Filipovic and J. Katanec (Dept. of Physical Chem., Ruder Boskovic Inst., Zagreb (Crotia, Yogoslavia)). *Colloid Polym. Sci.* 253(4), 306–10 (1975). Heterogeneous exchange process between iodine ions in the liquid and solid phase in silver iodide suspensions depends on concentration and chemical nature of the tenside present. Between the critical coagulation and stabilization concentrations of the ionic tenside with the electrical sign opposite to the electrical sign of the silver iodide particles, the AgI-I-(^{131}I) exchange becomes accelerated. Ultra-microscopic microelectrophoresis, radiometry, X-ray diffractometry and the results of the optical measurements indicate various structures of the interphase layer in the 'silver iodide-tenside' systems with a complex dependence on the conditions of the formation.

Effects of phase inversion and surfactant location on the formation of O/W emulsions. T.J. Lin, H. Kurihara and H. Ohta (Takasago Perfumery Co. Ltd., Tokyo, Japan). *J. Soc. Cosmet. Chem.* 26(3), 121–39 (1975). Placing of the surfactant in the oil phase prior to emulsification generally produces a finer O/W emulsion, with the same composition, prepared by initially placing the surfactant in the aqueous phase. To investigate the basic mechanisms responsible for the difference, a series of emulsions stabilized with various nonionic surfactants and oils were studied by using various preparative methods. Microscopic examination of the emulsion droplets and surfactant migration studies support a theory that when a hydrophilic surfactant is initially placed in the oil phase, a portion of the aqueous phase added during the emulsification process is solubilized or emulsified into the oil phase to form a W/O primary emulsion. This primary emulsion eventually inverts to form an O/W final emulsion as the surfactant migrates to the aqueous phase. A short-lived double emulsion of (W/O)/W type may be formed in the process of the phase inversion.

The percutaneous absorption of some anionic surfactants. D. Howes (Unilever Res. Lab. Colworth House, Sharnbrook, Bedford, U.K.). *J. Soc. Cosmet. Chem.* 26(1), 47–63 (1975). The irritant action of a surfactant to skin may be related to the ability of that surfactant to penetrate the stratum corneum and act upon the underlying viable tissues. The percutaneous absorption of some (^{14}C) labelled anionic surfactants has been measured in vivo in rats, after both consumer-type applications and applications of longer duration, and the results have been compared with those from in vitro studies using isolated rat skin and human epidermis. The methodology for both the in vivo and in vitro studies will be outlined and results presented from experiments with a series of sodium soaps of normal fatty acids, sodium lauryl sulfate, sodium lauroyl isethionate and sodium dodecylbenzene sulfonate. The in vivo technics can also provide information as to the metabolic fate of topically applied surfactants under user type conditions. The usefulness of the in vitro technics and their shortcomings are discussed.

Stability of inverse emulsions. Water in oil emulsions prepared with a series of copolymers. S. Marti, J. Nervo, J. Periard and G. Riess (School of Chemistry of Mulhouse, France). *Colloid Polym. Sci.* 253(3), 220–4 (1975). Oil/water emulsions stabilized by polystryrene (PS)-polyethylene oxide (POE) block polymers were studied. These copolymers are nonionic emulsifiers for the toluene-water system, and reversed emulsions of the water in oil type are preferentially obtained. Only with copolymers having a high amount of POE it is possible to obtain oil in water emulsions, the stability of which is however smaller. This behavior, consistent with Bancroft's rule may be correlated with solubility of the copolymer and with the expansion factors of the PS and POE sequences.

Factors which determine the skin irritation potential of soaps and detergents. C. Prottey and T. Ferguson (Environmental Safety Div., Unilever Res. Lab., Colworth House, Sharnbrook, Bedford, U.K.). *J. Soc. Cosmet. Chem.* 26(1), 29–46 (1975). Skin-surfactant interactions have been examined using specific laboratory tests with a series of pure surfactants. Effects of these compounds upon the stratum corneum have been studied by means of keratin denaturation and the extraction of proteins and amino acids. It was found that strongly anionic surfactants such as sodium lauryl sulfate, sodium lauryl ether sulfate and sodium lauroyl isethionate (Igepon A) had considerable activity, by virtue of their polar head groups, whereas sodium laurate and nonionic ethoxylates had minimal effect upon the stratum corneum. The effect of lipophilic chain length of the surfactants was important in their overall activity, in particular, the lauryl moiety. Percutaneous absorption of radioactively-labelled surfactants by guinea-pigs in vivo has been studied; sodium laurate and lauryl triethoxylate penetrated to a far greater extent than other compounds: lauryl hexaethoxylate, sodium lauroyl isethionate and sodium lauryl triethoxy sulfate had lower penetrabilities and sodium lauryl sulfate and sodium lauryl sulfonate were lower still. The effect of pure surfactants upon living cells was studied by means of measuring histamine release from rat peritoneal mast cells in vitro. Alkyl sulfates, alkyl ether sulfates and alkyl tri- and hexaethoxylates were potent mast cell lysins, whereas monoethoxylate and sodium laurate and sodium lauroyl isethionate were less effective. Chain-length studies showed that the capryl, lauryl- and myristyl moieties were the most potent lipophilic groups for releasing histamine. Some of these surfactants were applied directly to the skin of rats and the overall skin response determined by visual examination. Sodium laurate caused erythema after 24 h application, when other surfactants (sodium lauryl sulfate, ether sulfate, isethionate and nonionic triethoxylate) had no effect. After 3 days of application, sodium lauryl sulfate had the greatest effect upon the skin terms of dryness, scaling and cracking of the stratum corneum ertythma and oedema. Correlation of these results are discussed.

Preparation of a granular automatic dishwashing detergent. G.W. Kingry and F.H. Lahrman (Procter & Gamble). *U.S. 3,888,781.* The process for producing a crisp, free-flowing agglomerated granular detergent comprises the steps of (a) charging an alkaline builder salt into a mixing zone; (b) agitating the particles of builder in the zone; and (c) spraying thereon a liquid mixture of an alkali metal silicate, having an SiO_2-alkali metal oxide ratio of 3.2:1 to 2.5:1, at a temperature of 110–200 F, and a nonionic detergent. The ratio of alkali metal silicate to nonionic detergent ranges from 3:1 to 6:1. The liquid mixture is sprayed on at a level of 25–50% based on the total composition.

Liquid cleansing composition. G.B. Ulvild. *U.S. 3,887,497.* A one phase cleansing composition comprises (a) an anionic detergent surfactant, (b) a normally liquid organic solvent, (c) water, and (d) an alkaline builder material or a builder material which is a mineral acid or a neutral or acidic inorganic salt of the acid.

Sulfoils—the resurgent surfactants. H.L. Sanders and W.A. Lamont (Arthur Trach Co.). *Soap/Cosmetics/Chemical Specialties* 51(5), 39–40, 50, 78, 81 (May, 1975). Sulfated oils (or "sulfoils"), prepared by the reaction of 96% sulfuric acid with an unsaturated oil such as olive oil, have been known for many years. The growing petrochemical shortage, with resultant shortages in other types of surfactants, has led to renewed interest in these products. Following a brief review of their formation and chemistry, various performance properties of the sulfoils are discussed. These properties include solubility, foaming, wetting, stability, lime soap dispersion, hydrotropic action, rust prevention, HLB number, and emulsification. Different types of uses for the sulfoils are reviewed. Some of these applications are cleaners of various types, hand cleaners, cosmetics, metal working, paints, photoengraving, adhesives, and paper manufacture.

Fabric softening composition. L.W. Bernardino (Procter & Gamble). *U.S. 3,886,075.* The composition comprises 2–90% of a smectite-type clay having an ion exchange capacity of at least 50 meq/100 grams, 1–40% of a water-insoluble quaternary ammonium antistatic agent, and 1–40% of a compatibilizing agent.

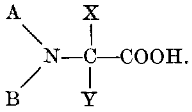
N-benzoylsaccharin as peroxygen bleach activator. F.F. Loffelman (American Cyanamid Co.). *U.S. 3,886,078.* A bleaching composition comprises hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of N-benzoylsaccharin.

Process for making an improved soap powder. J.M. Terry. *U.S. 3,886,087.* The process consists of dissolving 10–16 parts of sodium hydroxide in 64–128 parts of water to form an aqueous solution. The solution is heated and stirred while dissolving therein 80–105 parts of lard followed by addition of 8–30 parts of sodium tetraborate and 1–5 parts of coconut oil. The resultant mixture is heated and stirred for 2–6 hours to saponify the fat. The soap mixture is cooled and allowed to stand at room temperature for 2–4 days to yield a soap powder. The glycerine formed during the saponification is retained in the final product.

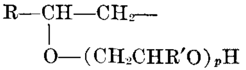
Detergent adjuvant combinations and detergent compositions. O.W. Burke, Jr. *U.S. 3,886,079.* A process for forming the adjuvant combination comprises (a) forming an aqueous solution of water soluble alkali metal silicate; (b) adding to the solution sufficient reactant selected from the class consisting of carbon dioxide and alkali metal bicarbonate to form a solution of electrolyte and a precipitate of alkaline silica pigment containing 0.2–40% bound alkali; and (c) recovering and drying together the combination of the alkaline silica pigment and at least 25% of the electrolyte resulting from step (b). The adjuvant thus formed may be combined with detergent materials consisting of soaps, anionic, or nonionic detergents.

Manufacture of free flowing particulate detergent composition. W.A. DiSalvo, E.J. Kenney and F.R. Smith, Jr. (Colgate-Palmolive Co.). *U.S. 3,886,098.* The procedure comprises making inorganic salt-containing base particles comprising at least 5% sodium carbonate, sodium bicarbonate, or sodium sesqucarbonate; 5–30% of sodium silicate; less than 15% of higher alkyl benzene sulfonate detergent; less than 4% nonionic detergent; and less than 0.5% sodium carboxymethyl cellulose. Over the surface of the base particles is distributed 2–20% of a higher alkoxy poly-lower alkoxy lower alkanol containing nonionic detergent. The higher alkoxy contains 10–18 carbon atoms, the lower alkoxy and lower alkanol contains 2–3 carbon atoms, and the total number of carbon atoms in the poly lower alkoxy lower alkanol is 20–30.

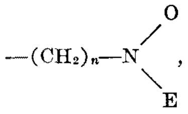
Detergent composition. H. Marumo (Carapus Co.). *U.S. 3,888,797.* The composition consists of at least one surface active agent as the active component of the formula:



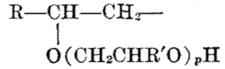
A or B is hydrogen, and A and B are independently



$R-CH(-O-(CH_2CHR'O)_pH)-CH_2-$, $-(CH_2CHR'O)_qH$, or $-COCH_3$. R is an alkyl radical of 6 to 28 carbon atoms, R′ is hydrogen or methyl, and *p* and *q* are independently integers from 0 to 50. X is hydrogen or an alkyl radical of 6 to 28 carbon atoms; Y is hydrogen, methyl, or $-CH_2CH(CH_3)CH_3$, $-CH_2-(CH_2)_n-COOH$, or



$-(CH_2)_n-N(O)(E)$, *n* is an integer from 1 to 5, and D and E are independently A and B; provided that X is hydrogen, at least one of A, B, D, and E is



$R-CH(O(CH_2CHR'O)_pH)-CH_2-$ Salts of these components may also be included.

Antibacterial detergent compositions containing phenylbismuth bis(2-pyridinethiol 1-oxide). J.D. Curry (Procter & Gamble). *U.S. 3,890,242.* An antibacterial and antifungal detergent composition comprises a water soluble detergent selected from the group consisting of soaps and nonsoap synthetic detergents, and 0.2–3% of phenylbismuth bis(2-pyridinethiol 1-oxide). The composition has a pH of less than 10.

Method and apparatus for producing striped bar soap. T.J. Kaniecki (Armour-Dial, Inc.). *U.S. 3,890,419.* The method involves pressing and passing a detergent material in a circular motion through a final plodding stage in which it is passed forward through a cylindrical channel by screw action. The material is then passed through a plurality of separate ducts contained in a plate between the plodding area and a conical area in which it is compacted. The improvement for forming the striped effect comprises introducing coloring material in a confined stream into the material through an injection tube located within one of the ducts. The area of the tube is small compared to the area of the duct to produce an extruded bar containing a stripe.

Encapsulated fabric softener. J.E. Grimm, III (Colgate-Palmolive Co.). *U.S. 3,896,033.* A fabric softener in particulate capsule form for the treatment of fibrous materials consists of at least one fabric softening compound suitable for the treatment of damp laundry to soften it and improve its antistatic properties. The softener has a coating of a water soluble or dispersible organic polymeric colloid material. The coating is 0.001–2 mm thick over at least 40% of the surface of the softener. The capsule particles have a thickness of 1–4 mm.

Softening agent compositions. H.-W. Eckert, P. Nikolaus, and C. Werner (Henkel and Cie). *U.S. 3,896,034.* A liquid or powdery softening agent composition for washed textiles consists of (a) 1–50% of a 3-acyloxy-2-hydroxypropyltrialkylammonium compound, (b) 0.2–10% of a nonionic surface active dispersing agent, (c) 0–15% of a group of compounds consisting of optical brighteners, antimicrobial active agents, souring agents, sequestering agents, perfumes, and dyes, and (d) the remainder up to 100% of a diluent such as water or a water soluble liquid or a solid carrier.

Detergent composition. A. Danesh. *U.S. 3,896,040.* The composition consists of a detergent and 5–95% of a builder corresponding to the formula $H\text{-}OCH_2CH_2\text{-}_nOCH_2COOM$. M is alkali metal or ammonium and *n* is an integer from 1 to 100.

Built detergent composition. L. Benjamin and D.S. Connor (Procter & Gamble). *U.S. 3,896,056.* The composition consists of (a) 8–50% of an organic surface active agent, (b) 70–25% of an inorganic precipitating builder, and (c) 0.1–10% of a precipitation modifier. The ratio of builder to modifier is in the range 1000:1 to 1:1, and the ratio of surface active agent to builder is in the range 20:1 to 1:20.

Fluorinated oily soil release agents. S. Raynolds (du Pont). *U.S. 3,894,992.* The agents are prepared by the condensation, in the presence of an acid catalyst and under temperature and pressure conditions which result in the removal of alcohol formed by the condensation, of (a) an alcohol of the formula $R_f(CH_2)_nOH$ wherein R_f is perfluoroalkyl of 4 through 16 carbon atoms, and *n* is an integer from 1 through 16; (b) a polyalkylene glycol; and (c) a poly (alkoxymethyl)melamine. The equivalents ratio of (a) to (b) is from 1:20 to 20:1, and the equivalents ratio of (a) + (b) to (c) is from 0.5:1 to 1.5:1.

Fluorinated oily soil release agents. S. Raynolds (du Pont). *U.S. 3,896,088.* Additional adducts containing perfluoroalkyl and prepared by a process similar to that described in *U.S. 3,894,992* are described.

Compositions for imparting renewable soil release finish to polyester-containing fabrics. M.S. Basadur (Procter &

Gamble). *U.S. 3,893,929.* The compositions, which are particularly suitable for use in preparing dilute aqueous acidic baths in which a renewable soil release finish is applied to polyester-containing fabrics, comprise 5–97.5% of a soil release agent. This agent is a copolymer comprising a dibasic carboxylic acid and a polyglycol. The remaining 2.7–95% of the compositions comprise a water soluble acidic compound. The compositions are free of materials which cause swelling of polyester fibers and also free of synthetic acid emulsion polymers.

Detergent softener compositions. B. Sundby and H.E. Wixon (Colgate-Palmolive Co.). *U.S. 3,893,930.* Detergent compositions having inherent softening properties contain as essential ingredients 5–30% of a dual detergent and softening compound consisting of esters of dicarboxylic acids and polyhydroxy tertiary monofunctional amines. The remaining 30–95% of the compositions consists of a water soluble builder salt.

Control of bacteria with detergent or cleaning compositions containing phenylthioureas. A. Hubele (Ciba-Geigy AG). *U.S. 3,893,936.*

(No Abstract)

Wetting agents for alkaline baths. F. Landauer, C. Beermann, M. Reuter, K.H. Lebkucher, and H. Kiesling (Hoechst Ag.). *U.S. 3,893,937.* A detergent mixture consists of (a) 10–80% of an alkyl sulfonic acid derived from light petrol, (b) 20–85% of an amine, and (c) 1–15% of a phosphoric acid ester of alkanols of 4–8 carbon atoms.

Method of manufacturing surface active agent having low content of unreacted oil. T. Ohogoshi and A. Kawakami (Lion Fat & Oil Co.). *U.S. 3,893,940.* A method for removing unreacted oil from salts of a sulfate and a sulfonate of an oil such as olefin containing 12–22 carbons, paraffin containing 12–22 carbons, or aliphatic monohydric alcohol containing 8–22 carbons comprises mixing an aqueous solution of the salt with 0.1–10 times the weight of the salt of a polyhydric alcohol, a polyoxyalkylene alkyl ether, a polyoxyalkylene alkyl phenyl ether, or mixtures of these three. The resulting aqueous solution is then stripped to remove the unreacted oil.

Method of conditioning fabrics. C.J. Gaiser (Procter & Gamble). *U.S. 3,895,128.* A fabric conditioning article includes a carrier comprising a web having a discrete surface coating of normally solid fabric softening agent. The web is resistant to shredding and tearing when tumbled with damp clothes in a laundry dryer. The fabric softening agent has a softening temperature below the 120–190 F temperatures encountered in laundry dryers. It thus softens and is transferred to fabrics with which it comes in contact. The agent is present on the web at levels of 1.0–10.0 grams per 105 square inches of web and forms a layer of irregular thickness ranging from 0.1 to 10.0 mils.

Sulfate esters of polyalkoxy adducts of ethylenediamine. I. Tomiyama, T. Sakai, S. Hashizume, and K. Ikeda (Nikka Chemical Industrial Co.). *U.S. 3,894,070.* A surface active compound is produced by reacting ethylene diamine and propylene oxide to obtain a product comprising tetrapolyoxypropylene ethylene diamine. The diamine is treated with potassium hydroxide, and ethylene oxide is added thereto to obtain an intermediate product which is sulfonated with chlorosulfonic acid. The reaction mixture is neutralized with aqueous sodium hydroxide to obtain the desired surface active compound having 10 oxypropylene groups and 60 oxyethylene groups.

Detergent compositions containing enzyme and chlorine scavenger. F. Tivin and E. Zeffren (Procter & Gamble). *U.S. 3,893,954.* The composition comprises 1–99% of an organic synthetic detergent, 1–99% of an enzyme, and 0.001–5% of a chlorine scavenger selected from the group consisting of tris(hydroxymethyl)-aminomethane, 2-amino-2-methyl-1,3-propanediol, 2-amino-2-ethyl-1,3-propanediol, 2-amino-1-butanol, 1-amino-2-propanol, 2-amino-1-propanol, and 2-amino-2-methyl-1-propanol.

Aqueous concentrate detergent component. T. Hewitt, D.E. Mather, and E.T. Messenger (Albright & Wilson, Ltd.). *U.S. 3,893,955.* The concentrate comprises 30–75% of a sulfate of an alkoxylated aliphatic C_8–C_{24} alcohol and 2–10% of a water soluble salt of a carboxylic acid of the general formula $A(COOH)_n$. n is an integer from 1 to 4, and A is hydrogen, a saturated aliphatic residue having 1–8 carbon atoms, or an unsaturated aliphatic residue of 2–8 carbon atoms. When n is 2, the formula is $(COOH)_2$. The aqueous concentrate would be a thick paste or gel in the absence of the salt of the carboxylic acid.

Continuous sulfonation process. A. Pryce (Lever Bros. Co.). *U.S. 3,891,689.* In the process, a liquid organic material selected from the group consisting of linear- and branched-chain alkyl benzenes, linear unsubstituted monohydric alcohols, and linear unsubstituted alpha olefins is reacted with sulfur trioxide in a sulfur trioxide-air mixture in two separate steps. The SO_3-air mixture and the liquid organic material are first passed through a reactor at a superficial gas velocity of 5–30 feet per second and then through a second reactor at a superficial gas velocity of 15–90 feet per second. The initial concentration of SO_3 in the SO_3-air mixture is 2–15% and the initial mole ratio of SO_3 to organic material is 0.9:1–1.5:1.

Softergent composition. A. Renold (Colgate-Palmolive Co.). *U.S. 3,891,563.* The composition comprises the reaction product of an N-higher alkyl-1,3-propylene diamine containing 12–22 carbon atoms and maleic anhydride together with a detergent.

Apparatus for producing a striated soap bar. C.P. Fischer (Colgate-Palmolive Co.). *U.S. 3,891,365.* The apparatus comprises a double-barreled soap plodder with a vacuum chamber between the discharge of the first barrel and the feed of the second. The second barrel comprises a pair of counter-rotating screws. In the vacuum chamber are two injection tips for adding dye. The ends of the tips are located outside of the center line of each screw and on the climbing sides of them.

Clear fabric softening composition. A.A. Rapidsarda, K.F. Schoene, and W.B. Benken (Lever Bros. Co.). *U.S. 3,892,669.* A clear, single phase, liquid fabric softener composition comprises 2–20% of dialkyl dimethyl quaternary ammonium salt and 98–80% of a solvent for the quaternary ammonium salt. The solvent is selected from the group consisting of arylsulfonates, alkanediols, alkylene glycols, monoethers of diethylene glycol, 2-alkoxy ethanols, water soluble quaternary ammonium compounds, N-alkyl sulfobetaines, N-2-hydroxymethyl taurines, amine oxides, phosphine oxides, sulfoxides, and nonionic surfactants.

Builders for detergent and cleansing agents. J. Kandler, K. Merkenich, K. Henning, W. Vogt, E. Auer, and H. Glaser (Hoechst Ag.). *U.S. 3,892,674.* A detergent composition contains dodecylbenzene sulfonate, tallow oil, hardened tallow soap, magnesium silicate, sodium silicate, sodium perborate tetrahydrate, sodium sulfate, and a builder. The builder is selected from the group consisting of the sodium salts of glycerol-trioxydiacetic acid, sorbitol-hexaoxydiacetic acid, and glycerol trimalic acid. It is present in a proportion of 10–80%.

Detergent compositions. E.G. Budnick (Plains Chemical Development Co.). *U.S. 3,892,676.* The compositions consist of a water soluble synthetic detergent and a builder which is an alkali metal or ammonium salt of methane hydroxy diphosphonic acid.

Built detergent composition containing calcium-insensitive detergent. L. Benjamin and J.H. Saylor (Procter & Gamble). *U.S. 3,892,680.* The composition consists of a synthetic organic detergent and as a builder a mixture of an alkali metal carbonate and an alkali metal silicate. The ratio of carbonate to silicate is 3:1–1:3 and the SiO_2/M_2O ratio of the silicate when M is an alkali metal is 1.0 to 3.5:1. The ratio of detergent to builder is 1:10–3:1.

Washing or dyeing with a nonterminal vicinal alkanediol adduct of ethylene and propylene oxides. W. Schade, P. Krings, and H. Batka (Henkel & Cie). *U.S. 3,892,522.* In the process of treating textiles in an aqueous bath containing a wetting agent there is claimed an improvement consisting of utilizing 0.1–5 g/l of a poorly foaming alkylene oxide adduct of 5–20 mols of ethylene oxide and 1–10 mols of propylene oxide in a mol ratio of 1:0.1 to 1 to a nonterminal, vicinal alkanediol having 10–20 carbon atoms as the wetting agent.

Detergent composition. J.B. Edwards and F.L. Diehl (Procter & Gamble). *U.S. 3,892,681.* The composition contains 4–60% of an organic surface active agent, 0.1–6% of a granular, water insoluble starch having an average particle diameter of 1–45 micrometers and a swelling power of less than 15 at 65 C, and 1–50% of a smectite-type clay having an ion exchange capacity of at least 50 meq/100 g.

ACTIVATED PEROXYGEN DETERGENT. F.W. Gray and P.S. Grand (Colgate-Palmolive Co.). *U.S. 3,894,960.* A built laundry detergent composition consists of (a) water soluble anionic sulfonate or sulfate detergent, (b) sodium silicate as the principal builder salt, (c) a peroxygen compound, and (d) an activator for the peroxygen compound having a carboxylic acyl group. The peroxygen compound reacts with the activator to form the corresponding percarboxylic acid on addition of the composition to the wash water. The ratio of (c) to (d) is from 8:1 to 2:1 of the stoichiometric ratio for the reaction. The ratio (a + b): c is at least 2:1, and the ratio b: c is over 1:1. The sodium silicate has an $Na_2O : SiO_2$ ratio of 1:2 to 1:3.

DETERMINATION OF THE "POTENTIAL SURFACE-ACTIVE HYDROXYL CONTENT" OF FATTY ALCOHOLS AND THEIR ETHOXYLATES. D. Owen and A.T. Pugh (Lankro Chemicals Ltd., Bentcliffe Works, Salters Lane, Eccles, Manchester, M30 OBH, England). *Analyst* (London) **100**, 269–74 (1975). A quantitative sulphation procedure for hydroxyl groups has been developed which when used in conjunction with an established method for determining anionic surfactants, gives a rapid analytical method for the determination of the "potential surface-active content" of alcohols or their ethylene oxide derivatives. With this procedure it is possible to discriminate between potentially surface-active and other hydroxyl groups. ■

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