ABSTRACTS . . . .

E. S. Lutton, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Continuous buttermaking o.k.'d in Midwest trial. Anon. *Food Eng.* **25**(2), 47, 208-209(1953). The Westfalia machine is described.

Fats find vinyl outlet. Anon. *Chem. Week* **72**(18), 40-42(1953). A brief description of the use of epoxidized and hydroxylated and acetylated fats as plasticizers is given.

U. S. oils face more competition. Anon. *Soybean Digest* **13**(7), 24-5(1953). U. S. fats and oils can continue to find a ready market in Europe if their price and quality are competitive.

The qualitative determination of higher fatty acids by string electrophoresis. A. J. G. Barnett, H. Lees and K. K. Smith (Univ. Aberdeen). *Biochem. J.* **53**, xxxiii(1953). Stearic, palmitic, myristic and lauric acids were separated by this method.

The structure of kamlolenic acid. R. C. Calderwood and F. D. Gunstone (The Univ., Glasgow, W. 2). *Chemistry & Industry* **1953**, 436-7. The structure of kamlolenic acid, which occurs in the seed oil from *Mallotus philippinensis* is probably represented by the formula $HO(CH_2)_4CH:CHCH:CHCH:CH(CH_2)_7CO_2H$.

Refractive indices of some saturated and monoethenoid fatty acids and methyl esters. B. M. Craig (Nat. Res. Council, Saskatoon, Sask.). *Can. J. Chem.* **31**, 499-504(1953). The refractive indices for a number of saturated and monoethenoid fatty acids and their methyl esters have been determined. Equations have been calculated to obtain the refractive index at any given temperature.

The component glycerides of stillingia oil. A. Crossley and T. P. Hilditch (Univ., Liverpool). *J. Sci. Food Agr.* **4**, 38-44 (1953). The glycerides of stillingia oil were studied by resolution into a series of fractions by crystallization from acetone. Owing to the presence of decadienoic acid (8%) with linolenic acid (51%) and linoleic (22%), 95% of the glycerides are tri-polyethenoids.

Another outlet for vegetable oils from American farms. E. M. Deck (Mrs. Tucker's Foods, Inc., Sherman, Tex.). *Soybean Digest* **13**(5), 14-16(1953). A brief description of the use of vegetable oils in the manufacture of ice cream-type products is given.

The fixed oil from the seeds of Carum copticum Benth. (Ptychotis Ajowan). M. O. Farooq, S. M. Osman and M. S. Ahmad (Muslim Univ., Aligarh, India). *J. Sci. Food Agr.* **4**, 132-34 (1953). The oil from the seeds of *Carum copticum* Benth. of Indian origin has been analyzed. Petroselinic acid is a major component of the fatty acids, linolenic and any saturated acid other than palmitic are absent.

Determination of moisture in oil seeds. M. Th. Francois and G. Pasquier (Lab. Chevreul, Paris). *Bull. mens. inform. ITERG* **7**, 11-13(1953). The "Thermical balance Buhler," moisture apparatus, allows weighing of the sample without removing it from the oven. At 115-125° the results are obtained in 5-10 min.; they are slightly higher than those of the official oven method. Rape, peanut, linseeds, and soybeans are tested. (*Chem. Abs.* **47**, 4106)

Infrared spectra of some long-chain 2-alkenoic acids and their bearing on the structure of C_{27}-phthienoic acid. N. K. Freeman (Univ. Calif., Berkeley, 4). *J. Am. Chem. Soc.* **75**, 1859-63(1953). The infrared spectra of 6 long-chain 2-alkenoic acids with different types of branching near the double bond were presented and discussed. Comparison with the spectrum of C_{27}-phthienoic acid provides additional support that this molecule has an α-methyl branch.

Adsorption of ions on monolayers of fatty acids. II. Formation of biomolecular films of fatty acids on solutions of silver salts. M. A. Gerovich, R. I. Kaganovich and I. F. Reznik (M. V. Lomonosov State Univ., Moscow). *Zhur. Fiz. Khim.* **25**, 1198-1205(1951). If a sufficient amount of $AgNO_3$ is injected under a monolayer of palmitic acid on water, the surface potential ΔV of palmitic acid decreases to zero in about 15 min. The minimum concentration of $AgNO_3$ is 3×10^{-5} *N*, 3×10^{-4} *N*, and 3×10^{-3} *N* at pH 6, 5, and 4, respectively. Monolayers of cetyl alcohol are not affected by $AgNO_3$. (*Chem. Abs.* **47**, 4165)

Extension of the Traube-Duclaux law: The adsorption of saturated fatty acids on paraffin. L. P. Guastalla. *Compt. rend.* **235**, 941-3(1952). The coefficient of the Traube-Duclaux rule, which is practically equal to 3 for the adsorption of fatty acids on the free surface of their aqueous solutions, becomes 3.85 for the adsorption of these materials on the surface of solid paraffin. From these coefficients it was calculated that the energy of adsorption per CH_2 group is 440×10^{-16} ergs when the coefficient is 3 and 540×10^{-16} ergs when the coefficient is 3.85. (*Chem. Abs.* **47**, 4165)

Vegetable oils. II. Further studies of seed oils of various Strophanthus species. F. D. Gunstone (Univ. Glasgow). *J. Sci. Food Agr.* **4**, 129-32(1953). The component acids of the seed oils of *S. sarmentosus*, *S. hispidus* and *S. courmontii* have been determined and it has been shown that 9-hydroxyoctadec-12-enoic acid is present in each seed oil.

The component acids and glycerides of refined neem (Melia indica) oil. S. S. Gupta and C. R. Mitra (Nat. Chem. Lab. India, Poona). *J. Sci. Food Agr.* **4**, 44-48(1953). Palmitic (16.2%), stearic (14.6%), oleic (56.8%), linoleic (9.0%) and arachidic (3.4%) acids were found to be the major component acids from neem oil. The glyceride composition is in accordance with the rule of even distribution.

Determination of total fat, milk fat, and coconut oil in chocolate products. H. Hardorn and R. Jungkunz (Lab. V. S. K., Basel, Switz.). *Rev. intern. chocolat.* **7**, 289-301(1952). Correct values for total fat can be obtained with the international method which utilizes hot 4 *N* HCl, or by the coagulation method of Grossfeld. Total milk fat can be determined readily by measuring the volatile fatty acids which are soluble in H_2SO_4 saturated with K_2SO_4 and caprylic acid. Coconut oil as well as milk fat can be determined in mixtures from butyric acid no. and the "rest no." "Rest no." is obtained by determining the lower fatty acids present in 5 g. of fat after precipitation of higher fatty acids with $MgSO_4$ and subtraction of butyric acid no. "Rest no." is therefore proportional to the concentration of caprylic and caproic acids. (*Chem. Abs.* **47**, 4518)

Synthesis of fatty acids and fats in ripening oilseeds. T. P. Hilditch. *Chemistry & Industry* **1953**, 320. A lecture.

The solubilities of oleic and linoleic acids in common organic solvents. C. W. Hoerr and H. J. Harwood (Armour & Co., Chicago). *J. Phys. Chem.* **56**, 1068-73(1952); *Am. Doc. Inst. Doc.* **3619**. (*Chem. Abs.* **47**, 3660)

Improved neutral red test and Nile blue test for the investigation of fat. H. Keller (Justus-Liebig-Hochschule, Giessen, Ger.). *Lebensmitteltierarzt* **3**, 105-6(1952). Simplifications of the qualitative neutral red test and Nile blue test methods for fat were developed; the test can be made within a few seconds. (*Chem. Abs.* **47**, 4517)

South African fish products. XXXIII. The rock lobster: the composition of the hepatopancreas oil. S. P. Ligthelm, L. Novellie, H. M. Schwartz and M. M. von Holdt (Nat. Chem. Res. Lab., P. O. Box 395, Pretoria). *J. Sci. Food Agr.* **4**, 21-24 (1953). The main sites of fat deposition in the rock lobster are the hepatopancreas and the gonads. The component acids (weight %) of hepatopancreas oil are: saturated acids C_{14} 1.1, C_{10} 10.3, C_{18} 8.1, C_{20} 4.2, C_{22} 0.5; unsaturated acids C_{14} 2.4(−2.0 H), C_{16} 7.3(−2.1 H), C_{18} 14.3(−2.9 H), C_{20} 28.4(−6.5 H), C_{22} 19.0(−8.3 H), C_{24} 2.6(−2.1 H) and C_{26} 1.8(−2 H). Cholesterol and α-glyceryl ethers are the main components of the unsaponifiable portion.

Estimation of the 9:10-dihydroxystearic acids and their acyl derivatives. G. King (St. Mary's Hospital Med. School, London, W. 2). *Nature* **171**, 566-7(1953). Dihydroxy stearic acids are determined by the periodate method.

Preparation of eurucic acid. G. Knafo. *Bull. mens. inform. ITERG* **7**, 24(1953). Preparation from the mixed fatty acid of rapeseed oil by treatment at 30° with a saturated solution of urea (10 ml./g. of fatty acids), filtration at 17°, and recovery of acids from the precipitate by decomposition with hot water and ethyl ether extraction give a fraction of molecular weight 330, acid no. 171, iodine no. 74.5, and m.p. 29°. No improvement occurs on reprecipitation. (*Chem. Abs.* **47**, 4105)

The fatty oil from seeds of Erysimum canescens. N. Ya. Maslov and A. E. Petrov-Spiridonov (K. A. Timiryazev Agr. Acad., Moscow). *Zhur. Priklad. Khim.* **25**, 1326-9(1952). The oil contains oleic acid 43.98, α-linoleic acid 2.02, α-linolenic acid 2.36, palmitic acid 10.5, erucic acid 28.98, glycerol 8.52, and unsaponifiables 1.64. (*Chem. Abs.* **47**, 4632)

Periodic reagents in determination of glycerol and monoglycerides. R. Montequi and A. Doadrio (Inst. "Alonso Barba" Madrid). *Inform. quim. anal.* (Madrid) **6**, 31-40(1952). A modification of the periodic oxidation method of Handschumaker and Linteris makes it possible to determine monoglycerides mixed with triglycerides, but free glycerol interferes. (*Chem. Abs.* **47**, 4247)

The use of antioxidants in dry dog food. J. F. Neumer and L. R. Dugan Jr. (American Meat Institute Foundation, Univ. of Chicago). *Food Technol.* **7**, 189-191(1953). The effectiveness of antioxidants for stabilizing dry dog foods containing added animal fats has been studied using room storage and Schaal oven tests. Most effective were the antioxidants of the hindered phenolic type *e.g.* butylated hydroxyanisole, 2,6-di-tert-butyl paracresol (Ionol), and 2,2-methylene bis-4-methyl-6-tert-butylphenol (A.O.—2246). Less effective were propyl gallate, nordihydroguaretic acid, and p-hydroxydiphenylamine. Added fats did not reduce the stability of the dog food but a petroleum ether-soluble constituent of the dog food limited the effectiveness of the antioxidants in protecting the fat-meal mixes from oxidative rancidity.

A new method for measuring the development of rancidity. J. F. Neumer and L. R. Dugan, Jr. (American Meat Institute, Univ. of Chicago). *Food Technol.* **7**, 191-194(1953). A new method for determining relative stabilities against oxidative rancidity of dry dog foods containing added inedible-grade animal fats is based on the colorimetric determination of volatile "carbonyl" compounds formed during aeration of the dog food at 97°. Periodically, the "carbonyl" compounds in the effluent gases are determined by the method of Lappin and Clark which involves reaction with 2,4-dinitrophenylhydrazine and measurement of the optical density of the final alkaline solutions at 480 mμ.

Palmitic acid-purification of the product of its alcoholysis in view of its thermal analysis in binary and ternary systems. G. Nierinckx and H. Struelens (Lab. rech. chim. ministere colonies, Tervuren, Belg.). *Bull. agr. Congo Belge* **43**, 987-98 (1952). Commercial palmitic acid was recrystallized 8 times from acetone, its iodine no. being lowered to 0.02. Solidification temperatures of pure methyl and ethyl palmitates made therefrom were 29.30 and 22.90°. (*Chem. Abs.* **47**, 4107)

Solvent extraction industry in India. H. V. Parekh (Bhavnagar Chem. Works, Ltd., Vartej, Saurashtra). *Chem. Age* (India) Ser. **6**, 139-47(1952). A discussion of the extraction of valuable oil from oil cakes now used as fertilizers. (*Chem. Abs.* **47**, 4632)

The effect of aging cream upon the distribution pattern of free C_4, C_5 and C_6 fatty acids. I. I. Peters (Texas Agr. Exp. Station, College Station). *J. Dairy Sci.* **36**, 268-73(1953). Free caproic and valeric acids were absent altogether or present in small quantities only, both in fresh samples and in samples incubated at 85° F. for 7 days. Free butyric acid was present in all fresh control samples and increased in quantity during incubation. The butyric acid was identified as *n*-butyric acid in every instance. It is believed that the butyric acid in incubated samples may originate in part from milk serum constituents, most probably lactose.

Pilot plant for solvent extraction of oil cakes. Y. K. Raghunatha Rao (Central Food Technol. Research Inst., Mysore). *J. Sci. & Ind. Research* (India) **11A**, 414-15(1952). A flow sheet and description are given for a plant capable of processing 50-100 lb. of material per batch. Oil recovery up to 95% is obtained. The meal contained less than 1% residual oil and when proper solvent is used (*e.g.*, ethanol) the meal or flour can be made fit for human consumption. (*Chem. Abs.* **47**, 4108)

Growth and optical properties of stearic acid crystals. P. M. Reynolds and A. R. Verma (Royal Holloway College, Englefield Green, Surrey). *Nature* **171**, 486-7(1953). Some properties of stearic acid crystals formed on evaporation of a benzene solution are given.

Utilization of jute seeds with particular reference to the seed fat. N. K. Sen and J. K. Chakravarti (Presidency Coll., Calcutta). *Indian Soap J.* **18**, 164-70(1952). Jute seed upon extraction with petroleum ether (b. 40-60°) yields 15% oil, while successive expressions in a hydraulic press yield 10%. Refining losses are high. The oil was satisfactorily refined by treatment with MgO. Jute-seed oils from *Corchorus capsularis* and from *C. olitorius* had the following respective characteristics: d_{28} 0.923, d_{30} 0.9184; n_{25} 1.4661, 1.4724; viscosity at 28° (related to water) 53.1417, ——; titer 20°, 10°; saponification value 184.6, 191.7; iodine value 104.6, 119.2; free fatty acid (as oleic) 8.5, 16.2%; acetyl value 27.3, 19.8; Reichert-Meissl value 0.16, 0.21; unsaponifiable 5.4, 5.0%. The two oils contained the following fatty acids, respectively: palmitic 12.0, 16.9; stearic 4.6, 3.7; arachidic 2.2, ——; behenic ——, 1.8; lignoceric 0.9, 1.1; cerotic 1.2, ——; oleic 28.7, 9.1; linoleic 41.3, 62.5; linolenic 4.7, 0.9; and C_{20} acid 4.4, 4.0%. The press cakes from the two oils contained, respectively: ash 6.0, 7.2; *N* 4.3, 4.6; P_2O_5 2.0, 2.5; and K_2O 1.5, 1.6%. (*Chem. Abs.* **47**, 4107)

Urea complexes of rape-oil fatty acids. J. H. Skellon and C. G. Taylor (Acton Tech. College, London, W. 3). *Nature* **171**, 266-7(1953). Urea complex fractionation is advantageous for preliminary separation of mixed rape-oil fatty acids during the preparation of erucic acid.

The tropics as sources of vegetable oils and fats. H. Tempany. *Chemistry & Industry* **1953**, 430. The author points out that the world must in the future look increasingly to the tropics for supplies of oils and fats. The most promising sources are coconut and oil palms.

Acidification of palm kernel oil under the influence of atmospheric humidity. L. Thuriaux (Lab. technol. agr., Yangambi, B. Congo). *Bull. inform. inst. natl. etudes agr. Congo* **1**, 287-8 (1952). In transportation of palm oil in tanks the use of Neoprene joint fitting is recommended to exclude moisture and concomitant development of free acidity. (*Chem. Abs.* **47**, 4107)

Prevention of fishy taste in butter. Use of antioxidants. F. D. Tollenaar (Central Inst. Nutrition Research T. N. O., Utrecht, Netherlands). *Fette u. Seifen* **55**, 3-7(1953). The peroxides formed in butter are fairly stable at 100° and are not decomposed by octyl gallate. Butterfat from untreated butter was stable for 23 hrs. at 100° (Swift stability test); fat from butter treated with 0.008% dodecyl gallate was stable 94 hrs. under the same conditions. The addition of 0.001% tetraethylthiuramdisulfide was successful in inhibiting oxidative defects but decreased the stability at 100° to 12 hrs. (*Chem. Abs.* **47**, 4516)

Chemical investigation of skipper oil. Y. Tsuchiya and T. Kikuchi (Tohoku Univ., Sendai). *Tohoku J. Agr. Research* **2**, 49-52 (1952). The skipper fish, *Cololabis saira*, had 6.99% oil in the white meat and 15.54% in the red meat. Analyses of the oils show, respectively: d_{13} 0.9320, 0.9331; n^{20} 1.4782, 1.4771; acid no. 2.73, 3.49; saponification no. 195.3, 197.8; iodine no. 128.8, 130.4; (SCN) no. 74.8, 81.2; peroxide no. 0.0068, 0.0088; unsaponifiable matter 0.98, 1.11%; vitamin A 84, 140 international units per g.; N 68.9, 136.7 mg. %; P 251.4, 401.5 mg. %; and S 2.9, 4.4 mg. %. The ratio of solid acids to liquid acids in red-meat oil is about 1:3.1 as against 1:2.2 in white-meat oil. (*Chem. Abs.* **47**, 4108)

Some chemical properties of helvolic acid. T. I. Williams (Univ. Oxford, Engl.). *Biochem. J.* **51**, 538-42(1952). All evidence supports the formula $C_{32}H_{42-44}O_8$ for helvolic acid, which titrates as a monobasic carboxylic acid. The 8 atoms of O are satisfactorily accounted for as CO_2H, 4 acetyl, and 2 carbonyl groups. (*Chem. Abs.* **47**, 4323)

Distillation of rice oil fatty acid. I. Yamakita, Y. Araki and S. Shimamoto (Kyoto Univ.). *Bull. Inst. Chem. Research, Kyoto Univ.* **24**, 81-2(1951). For distillation of rice oil fatty acid at 1 mm. Hg and at 200-30°, employment of a cylindrical molecular distillation type apparatus diminished the degree of polymerization of unsaturated fatty acid and increased the yield of fatty acid in the distillate by 5% as compared with that of a flask-type apparatus. (*Chem. Abs.* **47**, 4631)

Studies on the rancidity of olive oil. IV. Testing with the Schaal test. J. de la Borbolla, G. Gutierrez, G. Quijano and R. Vazquez Ladron. *Anales de la Real Sociedad Espanola De Fisica y Quimica* **49B**, 255-262(1953). Using the Schaal test, the surface influence and that of volume in both the phases of the oxidation of olive oil were studied. During the induction period the quantity of peroxide oxygen formed is proportional to the volume and independent of the surface. In the second phase of oxidation the amount of peroxide is independent of the volume and directly proportional to the surface.

Nickel and copper catalysts for the saturation of glycerides and fatty acids by hydrogenation. Part I. R. Sanchez Delgado. *Revista de Ciencia Aplicada* **7**, 39-50(1953). The methods of preparing nickel, copper and nickel-copper catalysts for the hydrogenation of unsaturated glycerides and fatty acids are described in detail. Data is presented to show the effects of varying the proportions of the metals in the nickel-copper mixtures on the hydrogenation of olive oil. Nickel-copper mixtures were more effective catalysts than a nickel catalyst prepared from nickel formate.

Fats, oil and soap in modern drawing technique. A. Pollack. *Seifen-Öle-Fette-Wachse* **79**, 225-226(1953). The compounds, mixtures and emulsions used as drawing agents in the metal industries are discussed.

The composition of natural bone fat. L. Rasmusson. *Seifen-Öle-Fette-Wachse* **79**, 227(1953). Bone fat is an important raw material for the fat chemical industry in Sweden. The percentages of the fatty acid components in the fats from the bones of different animals are tabulated.

Chemical constitution of cork. Ignacio Ribas (Saint Jacques de Compostello, Spain). *Chimie et industrie* **68**, 333-50(1952). A complete survey of the chemistry of cork, describing its constituents: ash, waxy fraction, suberin, fatty acids, glycerol, and cellulose. Cf. Drake, C.A. **35**, 2116^2. (*Chem. Abs.* **47**, 3495)

The cleavage of fat: its principles and latest progress. E. Schlenker. *Seifen-Öle-Fette-Wachse* **79**, 179-181, 223-225(1953). The physical and chemical principles of fat splitting, the progress of reaction, the degree of cleavage, catalysts and the cleavage process are discussed. The technical part deals with the preliminary treatment of the raw materials, mixing and separation, addition and economy of heat and structural materials.

Some recent experiments with antioxidants. F. D. Tollenaar. *Olearia* **7**, 5-14(1953). The self-oxidation of oils and fats and the problems relating to the use of antioxidants are discussed. The activity of an antioxidant is considered particularly with respect to its power to avoid the reduction of the organoleptic properties of an edible oil or fat during conservation. The influence both of the composition of the fat and of the conditions of conservation on the activity of the antioxidants also is taken into account.

A method of examining oils. A specific reaction of rapeseed oil. Vizern and Guillot. *Oleagineux* **8**, 197-201(1953). The method was developed to test for the adulteration of peanut oil by rapeseed oil and other semi-drying oils. A 1 ml. sample of the total crude fatty acids prepared from the peanut oil to be tested is dissolved in 10 ml. of pure acetone heated at 50-51°C. From a pipette exactly 1 ml. of 1 N aqueous potassium hydroxide is added. The mixture becomes turbid and is reheated until it clears and then is cooled to 14°C. and maintained at this temperature for 12 hours. The soap crystals are filtered off and the filtrate cooled to 4.5-5°C. If 10% or more of rapeseed oil is present in the original oil, a turbidity which does not develop into a crystalline precipitate within 20 minutes will form. If 5% or less of rapeseed oil was present, the liquid becomes opalescent and very small crystals develop on standing. The reaction is said to be specific for rapeseed oil, since other semi-drying oils form crystals readily on cooling to 5°C. after the above described treatment.

Sinitiro Kawamura, Abstractor

Higher fatty alcohols. V. The Bouveault-Blanc reduction of sardine and calamary oils and the preparation of oleyl alcohol by urea complexes. Shinroku Masuyama (Osaka Municipal Tech. Research Inst.). *J. Agr. Chem. Soc. Japan* **26**, 524-7 (1952) (Pub. 1953). Alkali-refined sardine and calamary oils were reduced with Na and ethylene glycol monoethyl ether (Cellosolve) in toluene or xylene to corresponding alcohol mixtures with good yields. The mixtures of higher alcohols were fractionated by vacuum distillation; the distillate fractions were analyzed for iodine no. and OH no. Nearly pure oleyl alcohol was prepared by the method of urea adduct from the sardine and calamary oil alcohols.

Higher fatty alcohols. VI. The Bouveault-Blanc reduction of cottonseed and poppyseed oils and the preparation of cetyl, oleyl, and linoleyl alcohols by urea complexes. Shinroku Masuyama. *J. Agr. Chem. Soc. Japan* **26**, 622-5(1952) (Pub. 1953). Similar methods were applied to cottonseed and poppyseed oils. Pure cetyl, oleyl, and linoleyl alcohols from cottonseed oil and oleyl and linoleyl alcohols from poppyseed oil were isolated by the method of urea adduct.

Separation and identification of fatty acids. XV. Paper chromatography of saturated higher fatty acids. Yoshiyuki Inoue and Manjirô Noda (Kyoto Univ.). *J. Agr. Chem. Soc. Japan* **26**, 634-8(1952) (Pub. 1953). Separation of fatty acids was accomplished by reversed phase paper chromatography: filter paper impregnated with petroleum hydrocarbon mixture (b.p. 140-170°) was used and the most suitable solvent systems were MeOH-petroleum hydrocarbon and MeOH-acetone-petroleum hydrocarbon. A 0.2% solution of bromocresol green in alcohol (adjusted to blue color with KOH) was used as the spray reagent. R_f values for 13 saturated fatty acids from butyric to behenic acid are given.

Fatty acid composition of porpoise head oil. Yukihiko Nakamura and Isamu Tsujino (Hokkaido Univ., Sapporo). *J. Agr. Chem. Soc. Japan* **26**, 642-5(1952) (Pub. 1953). The head oil of porpoise *(Phocaenoides dalli)*, d^{15} 0.9406, acid no. 5.5, saponification no. 313.3, iodine no. 28.5, unsaponifiable matter 1.42%, contained 29.1% volatile fatty acids (mainly isovaleric with a little isobutyric, capric, palmitic, and caprylic acids), nonvolatile acids (palmitic, lauric, myristic, stearic acids), and unsaturated acids (zoomaric, oleic, tetradecenoic, and more highly unsaturated acids).

Concentration of vitamin A by the solvent process. IV. Treatment of shark-liver oil with furfural, alcohol, and naphtha. Yoshirô Abe, Toyoko Ihara, and Ryûzô Taguchi (Keiô Univ., Tokyo). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 788-9(1952). Concentration of vitamin A was tried from shark-liver oil by mixed solvents consisting of furfural and either methyl, ethyl, isopropyl, *n*-butyl, or isoamyl alcohols. The effects of added alcohols were dissimilar for different alcohols. C_3-C_5 alcohols were effective in increasing the rate of concentrating vitamin A. In general the addition of alcohols was effective in promoting the separation of the solvent from oil and the separation of the extract from naphtha. Alcohols were useful in diminishing the coloration of furfural.

Highly unsaturated fatty acids of the liver oil of Erimacrus isenbecki. Tomotarô Tsuchiya and Osamu Okubo (Govt. Chem. Ind. Research Inst., Tokyo). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 804-5(1952). This liver oil contained highly unsaturated fatty acids of C_{20} and C_{22} chiefly, such as $C_{20}H_{30}O_2$, $C_{20}H_{32}O_2$, $C_{22}H_{32}O_2$, and $C_{22}H_{34}O_2$; besides it contained C_{24} highly unsaturated acids such as $C_{24}H_{36}O_2$ and $C_{24}H_{38}O_2$.

Glycerides. VIII. Reaction between stearic acid and glycerol. Nobuhiko Ishibashi and Issei Nakamori (Kyushu Univ., Fukuoka). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 811-12(1952). Stearic acid was reacted with glycerol at 130° with minimum interface. The glycerol layer did not contain acid or glyceride, while the stearic acid layer contained dissolved glycerol and formed glyceride. Monostearin (almost exclusively α-monostearin) first formed, and then distearin, but no tristearin under the experimental conditions.

PATENTS

Process for manufacture of high molecular weight ester from water miscible alcohol. R. E. Merz (Standard Oil Development Co.). *U. S. 2,637,736.* The process is claimed for esterifying oleic acid with isopropyl alcohol in the presence of an acidic esterification catalyst. The process comprises forming a reaction mixture of between 2 and 4 moles of 96-100% isopropyl alcohol per mole of the oleic acid, repeatedly esterifying the oleic acid in stages with added portions of the alcohol replacing alcohol distilled until nearly all oleic acid is esterified, intermittently between the stages removing alcohol and water formed from the reaction mixtures; neutralizing the esterification product with a portion of the alcohol retained therein, water washing the neutralized esterification product, and drying the washed isopropyl oleate ester thus produced.

Recovery of fatty acid values from aqueous liquids containing such values. F. S. Gibbs (F. S. Gibbs, Inc.). *U. S. 2,637,737.* Method of treating water containing emulsified fatty acid and a compound reactable with the fatty acid to form an insoluble soap is described which comprises agitating the water to induce reaction of the acid with the compound, effecting agglomeration of the resulting soap particles by subjecting the liquid mass to relatively gentle agitation, introducing minute gas bubbles into the mass to elevate the agglomerated soap particles to the surface of the mass and removing the elevated particles from the surface, the gas bubbles being introduced in company with liquid and in a manner precluding substantial disturbance of the surface.

Countercurrent extraction apparatus and process. G. Bottaro. *U. S. 2,638,409.* A continuous countercurrent extractor is described.

Process for the preparation of a stable butter. F. D. Tollenaar (de Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Voeding). *U. S. 2,638,420.* A manufactured butter product is claimed having incorporated therein a substance selected from the group consisting of dialkyldithiocarbamic acids and salts thereof, in an amount sufficient to inhibit rancidity and deterioration.

Method of refining oils with "versene." E. M. James (Lever Brothers Co.). *U. S. 2,638,476.* A process is claimed of refining a fatty glyceride stock which comprises treating the stock with aqueous alkali solution in an amount at least sufficient to neutralize free fatty acids contained in the stock in the presence of not over 1.0% of an organic amino-carboxylic acid compound selected from the group consisting of tetra alkali metal salts of ethylene diamine tetraacetic acid, tri alkali metal salts of trimethylamine tricarboxylic acid and di alkali metal salts of alkyl and aryl iminodiacetic acids to reduce refining losses, and then separating soapstock from the refined oil.

Absorbent refining of oils. H. A. Vogel (Pittsburgh Plate Glass Co.). *U. S. 2,639,289.* In a process of refining glyceride oil containing color matter, the steps are claimed of admixing the oil with synthetic magnesium silicate having active adsorbing surfaces, then blowing the oil at 200 to 250°F. with live steam to adsorb the coloring matter upon the magnesium silicate, and filtering off the magnesium silicate with the adsorbed coloring matter.

Hydrolysis of fatty acid esters. Bamag Ltd. and Hans Asch. *Brit. 679,538.* Fat was hydrolyzed under conditions of efficient heat exchange in a vertical cylindrical reactor with several transverse partitions, and with agitation. With a water-fat ratio of 0.6-0.7:1, in 1.5-3 hrs. at 250° and 35-40 atmosphere, and throughput of 1 ton/hr., hydrolysis was 92-3% complete, producing a relatively strong glycerol solution. A 2nd reaction vessel charged with incompletely hydrolyzed fat and 50% water produced 98% hydrolysis and a weak glycerol solution, which was recycled to the 1st reaction vessel. (*Chem. Abs.* **47**, 4110)

Fractionating fatty oils. Aktiebolaget Separator and Svenska Oljeslageri Aktiebolaget. *Brit. 682,797.* Fatty oils are fractionated during their simultaneous interesterification in the presence of a selective solvent and catalyst at such gradually reduced temperature that 2 liquid phases are continuously formed and separated. (*Chem. Abs.* **47**, 4635)

Refining fatty oils. Aktiebolaget Separator. *Brit. 684,035.* A 2-stage oil-refining process is described by which strong lye in insufficient quantity to neutralize all the fatty acids present in the oil is rapidly mixed with the oil, and the mixture is freed of the soap formed by the centrifugal separation. In the 2nd stage the oil is mixed and stirred vigorously at an increased temperature with the necessary quantity of lye. (*Chem. Abs.* **47**, 4635)

Durable butter. Nederlandsche Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Voeding (F. D. Tollenaar, inventor). *Dutch 70,854* (1952). To retard the occurrence of taste failures in stored butter, 0.02-0.0005% dialkyl-, diaryl-, or diarylkyl-dithiocarbamic acid or its salts, especially the soluble Na salts, is added at any phase of the preparation of the butter. (*Chem. Abs.* **47**, 4519)

Oils from raisin seeds by solvent extraction. M. A. Reynaud. *Fr. 801,607.* Powdered dried raisin seeds are continuously countercurrently extracted with hydrocarbon solvents. A detailed equipment description is supplied. (*Chem. Abs.* **47**, 4110)

Hydrolysis of fats and oils. K. Fukuzumi and S. Ozaki (Bureau of Industrial Technics). *Japan. 6731('51).* A mixture of 100 parts soybean oil, 4 parts castor-bean lipase, and 33 parts water containing 0.1% hexadecylpyridinium bromide is allowed to react for 5 hrs. at 38° to decompose 82% of the oil. (*Chem. Abs.* **47**, 4110)

• Biology and Nutrition

R. A. Reiners, Abstractor

Preparation of carotene from palm oil. P. Baizot and P. Cuvier. *Farmaco, Ed. prat.* (Pavia) **8**, 3-10(1953). Production of carotene is by distillation of the methyl esters of the oil, saponification of the distillation residue, extraction with petroleum ether, and isolation from the extract by chromatography. Extracted oil contains 4 times more carotene than pressed oil. (*Chem. Abs.* **47**, 4633)

Physiologic role of polyethylenic fatty acids. II. Influence of lipide-free regime on the nature of the phosphoaminolipides of rat liver. M. Beauvallet and P. May. *J. physiol.* (Paris) **44**, 210-13(1952). In adult female rats, a lipide-free diet induces after 5 to 7 months a decrease in total phosphatides and a drop in all categories of unsaturated fatty acids. Infant rats (25 days) born of mothers maintained on a lipide-free diet possess very low amounts of liver fatty acids containing 4, 5, and 6 double bonds. After another 25 days on the lipide-free diet, diene and triene fatty acids diminished in amount. (*Chem. Abs.* **47**, 3940)

Spectroscopic properties of vitamin A_2. Application to the assay of cod-liver oil. H. R. Cama and R. A. Morton (Univ. Liverpool). *Analyst* **78**, 74-79(1953). Directions for the determination of vitamin A_2, which is roughly 40% as potent as vitamin A_1, are given.

Toxicological studies on tung oil. T-C. Chou, C-L. Ho and C-S. Jang. *Science* (China) **29**, 121(1947); *Excerpta Med.* Sect. II, **1**, 423(1948). The pharmacological use of tung oil in China is discussed. Fed to mice, dogs, and humans, it may cause irritation of the digestive tract, which subsides rapidly. When mice were fed large doses of tung oil for long periods, no pathological changes appeared in the intestines. (*Chem. Abs.* **47**, 4507)

Fat-soluble vitamins in poultry nutrition. M. E. Coates. *Brit. J. Nutrition* **3**, 261-7(1950). The requirements of poultry for vitamins E and K can be adequately met by cereal grains and green feed. Most of the vitamin D requirements are not met by the action of sunlight, 0.5-1.0% of cod liver oil being ample to remedy this. Vitamin A is best supplied by carriers of carotenoids. (*Chem. Abs.* **47**, 4441)

Studies to determine the nature of the damage to the nutritive value of some vegetable oils from heat treatment. III. The segregation of toxic and non-toxic material from the esters of heat-polymerized linseed oil by distillation and urea adduct formation. E. W. Crampton, R. H. Common, Florence A. Farmer, A. F. Wells, and Donna Crawford (McGill Univ., Quebec). *J. Nutrition* **49**, 333-46(1952). Heat polymerization of alkali-refined linseed oil results in the formation of monomeric acyl radicals of "cyclized" or branched structure. These esters are highly digestible but are not utilized for growth. When they comprise 10% of the diet, it is rendered toxic. Dimeric acids formed on heating are nontoxic but also nondigestible.

The protective effect against X-irradiation of methyl linoleate in the rat. H. J. Deuel Jr., Amber L. S. Cheng, G. D. Kryder and M. E. Bengemann (Univ. So. Calif., Los Angeles). *Science* **117**, 254-5(1953). The addition of 10 mg. methyl linoleate daily to a fat free diet greatly decreased the mortality on repeated exposure to sublethal doses of x-rays.

Biogenesis of carotenoids. T. W. Goodwin. *Chemistry & Industry* 1953, 152. A lecture.

New procedure for the paper chromatographic determination of α-tocopherol. Jean Guerillot, A. Guerillot-Vinet and Liliane Delmas. *Compt. rend.* **235**, 1295-7(1952). As little as 1 γ α-tocopherol is detected on paper impregnated with a solution of 0.6 g./l. ferric undecylate in petroleum ether, with acetone-water (4:1) as the solvent, and spraying first with 2% HCl, then with 0.05% K ferricyanide. There is an instantaneous appearance of blue spots, the separations are clear cut, and the chromatograms stable. (*Chem. Abs.* **47**, 3914)

Lipide synthesis and transport in the dog. P. V. Harper Jr., W. B. Neal, Jr., and G. R. Hlavacek (Univ. of Chicago). *Metabolism* **2**, 69-80(1953). Carboxyl-labeled acetate was administered intravenously to normal or hepatectomized dogs, and tagged lipides were determined in plasma, liver, and other tissues. The turnover of fat acids between liver and tissues via the plasma was rapid in normal animals. In hepatectomized dogs, labeled lipide was not found in the plasma, but a rapid turnover of fat acid and free cholesterol and a slow turnover of phospholipide were demonstrated. (*Chem. Abs.* **47**, 4505)

The biosynthesis of squalene. R. G. Langdon and K. Bloch (Univ. of Chicago). *J. Biol. Chem.* **200**, 129-34(1953). When squalene is fed to rats, 5-10% of the amount administered can be recovered from the tissues. Squalene is synthesized by the tissues of the rat. Both C atoms of acetic acid are utilized. Squalene is a normal constituent of rat liver. It occurs in small concentrations and is regenerated rapidly. (*Chem. Abs.* **47**, 3952)

The utilization of squalene in the biosynthesis of cholesterol. R. G. Langdon and K. Bloch (Univ. of Chicago). *J. Biol. Chem.* **200**, 135-44(1953). C^{14}-squalene prepared biosynthetically from acetate is efficiently converted to cholesterol in the tissues of the mouse. (*Chem. Abs.* **47**, 3952)

The β-oxidation of fatty acids. F. Lynen, L. Wessely, O. Wieland and L. Rueff (Univ. Munich, Ger.). *Angew. Chem.* **64**, 687(1952). The identification and isolation of β-keto-hydrase (or β-hydroxy-dehydrase) and β-keto-thiolase (or condensing enzyme) as enzymes active in fatty acid metabolism is claimed. Experimental findings are critically evaluated. (*Chem. Abs.* **47**, 4452)

Biosynthesis of milk-fat in the rabbit from acetate and glucose. The mode of conversion of carbohydrate into fat. G. Popják, G. D. Hunter, and the late T. H. French (National Institute for Medical Research, London). *Biochem. J.* 54, 238-247(1953). The biosynthesis of fat was studied in lactating rabbits fed acetate, pyruvate and glucose labelled with ^{14}C. Glycerol was synthesized promptly in the mammary gland from glucose. Fatty acids and cholesterol were formed slower and from either glucose or acetate. p-Aminobenzoic acid was acetylated *in vivo* with acetate derived in part from glucose fed to the rabbits. Conclusion: glucose → pyruvate → acetate → fatty acids.

Linoleate oxidation catalysts occurring in animal tissues. A. L. Tappel (Univ. Calif., Davis). *Food Res.* 18, 104-8(1953). Most of the linoleate oxidation catalyzed by animal tissue extracts could be ascribed to their content of heme compounds.

• Drying Oils

Stuart A. Harrison, Abstractor

The quality control testing of floor varnishes. B. Andersson. *J. Oil and Colour Chemists' Assoc.* 36, 223(1953). Methods of assessing the quality of floor varnishes are described. They include the determination of drying time, abrasion resistance, extensibility, washability, paleness, and non-volatile content. Correlation between laboratory tests and performance under practical conditions was studied.

Thermal polymerization of drying oils. Contributions to the study of these reactions. J. Berger. *Bull. Soc. Chim. France.* 20, 511(1953). The author made a kinetic study of the thermal polymerization of non-conjugated semi-drying and conjugated triene oils. According to his interpretation in the case of the non-conjugated oils the polymerization is governed by a slow first order isomerization to the conjugated form followed by a rapid second order diene dimerization. The relation of viscosity to time can be expressed as follows: $\log \frac{n_1}{n_0} = K(T_1\text{-}T_0)$ where n_1 = final viscosity and n_0 = the initial viscosity. $(T_1\text{-}T_0)$ = time of heating. In the case of the conjugated trienes it appears that two mechanisms are operating; at low temperatures (190°) cyclization occurs first followed by dimer formation. At higher temperature (240°) there is apparently a combination of the above reaction and immediate bimolecular addition. The relationship of viscosity to time is as follows $n_1^p - n_0^p = K (T_1\text{-}T_0)$ where p = a constant.

Trends in alkyd manufacture. B. Farber. *Paint Varnish Production* 43, No. 4, 34(1953). Review of preparation and properties of alkyds.

The determination of the oil content of putty. K. A. Lammiman. *J. Oil and Colour Chemists' Assoc.* 36, 256(1953). A new method of determining the percentage of oil in putty is described. The method involves refluxing putty in ether, filtering through a sintered glass filter, washing with ether and then evaporating ether to obtain oil.

Acetone tolerances and bodied oils. A. E. Rheineck. *Official Digest Federation Paint and Varnish Production Clubs.* No. 340, 281(1953). The effect of different variables on the acetone tolerance of bodied oils is discussed. The variables considered are: viscosity, free acid and its structure, polyhydric alcohol in oil, chemical modification, bodying temperature, and type of oil. A broad classification of bodied oils can be made based on acetone tolerance. The acetone tolerance gives an indication of resin compatability of the oil. Different types of oils, however, with the same acetone tolerance cannot necessarily be considered equivalent. The practical value and limitation of the test are discussed.

The effect of driers on the properties of alkyd resin finishes. *Paint Manuf.* 23, 119(1953). At normal drier concentration neither the color or gloss of alkyd films are appreciably affected. The development of bloom can generally be controlled by the proper selection of driers. In general alkyds which show good water resistance also show a tendency to develop crystalline bloom. Both pentaerythritol and dehydrated castor oil alkyds are prone to develop crystalline bloom.

Dehydroxylated oils. G. Balbi. *Olearia* 7, 15-30(1953). The chemical reactions involved in the technological preparation of dehydrated castor oil are surveyed. From these reactions the more important practical data for obtaining a suitable industrial result are deduced. The dehydration of other vegetable oils, in particular grapeseed oil, is considered. It is proposed that the designation of "dehydroxylated oils" should be used to replace that of "dehydrated oils" until now used to designate hydroxylated oils from which the hydroxyl groups have been removed by suitable treatment in order to improve the drying properties of the oil.

Wood oils, their origin and use. H. W. Bf. *Seifen-Öle-Fette-Wachse* 79, 205-206(1953). The qualities of the various kinds of tung oils and their ensuing applications are discussed.

PATENTS

Modified olefin-diolefin resin. W. J. Sparks, D. W. Young and J. D. Garber. *U. S. 2,634,256.* Butadiene and a mono-olefin (preferably dimerized isobutylene) are copolymerized at temperatures below 10° using a Friedel-Crafts type catalyst. The polymer formed which generally has an average molecular weight of about 1,000 is then heated with maleic anhydride and a small amount of benzoyl peroxide to give a resinous product. When this resin is cooked with a drying oil such as linseed oil a varnish is obtained having improved properties.

Products and methods: reacting cashew nut shell liquid and polymers with unsaturated fatty acids. M. T. Harvey (The Harvel Corp.). *U. S. 2,637,709.* The method is claimed which comprises heating a mixture of anacardic material selected from the group consisting of (1) decarboxylated cashew nut shell liquid, (2) liquid polymers thereof and (3) mixtures thereof and unsaturated fatty acids selected from the group consisting of palmitoleic, oleic, linoleic, linolenic, arachidonic, licanic, clupanodonic, elaeostearic and ricinoleic acids and mixtures thereof, the mole ratio of anacardic material to unsaturated fatty acid being in the range of 2-1 to 2-4, maintaining the mixture at elevated temperature under reflux conditions while removing water of reaction as it is formed and until the hydroxy content of the mass measures between 85%-50% of the hydroxy content of the original mixture.

Styrene—drying oil modified alkyd resins. *Brit. 679,144.* Resins for varnishes and enamels are prepared by preparing a phthalate of a hydroxyl containing, copolymer of a drying oil, styrene and α methyl styrene. Thus linseed oil (50 pts.), styrene (35 pts.), and α methyl styrene (15 pts.) were heated at 155-205°. The product (800 g.), 95% glycerol, 83.6 g., and calcium oxide 0.1 g. were heated at 250° for two hours, and the water of reaction was removed. After cooling to 200°, 202 g. of phthalic anhydride was added and the mixture heated at 250° for one hour under nitrogen. Solutions of the products containing drier gave clear, hard films on air drying. (*Chem. Abs.* 47, 4651)

Copolymerization of styrene and drying oils. S. E. Bradshaw and E. M. Evans. *Brit. 680,441.* Styrene and a drying oil are copolymerized in the presence of a transfer agent, such as carbon tetrachloride, ethylenedichloride, di and triphenylmethane, fluorene, acenaphthene and pentaphenylethane to minimize cross-linking. Thus four parts styrene, one part tung oil prebodied for 40 minutes at 230°, and one part carbon tetrachloride are refluxed for seven hours. After distilling off unreacted materials, two parts of xylene are added to give a varnish with a viscosity range of 1.6 poises at fifty per cent solids. With drier, films dry to the dry-to-touch stage in less than one hour. (*Chem. Abs.* 47, 4630)

• Waxes

R. L. Broadhead, Abstractor

Isolation and characterization of constituents of alfalfa wax. E. H. Blair, H. L. Mitchell, and R. E. Silker. *Industrial and Engineering Chemistry* 45, 1104-1106(1953). Alfalfa extracts were adsorbed on tricalcium phosphate. A carotene fraction was obtained by eluting with Skellysolve B and a chlorophyll fraction was obtained by eluting with 5% isopropyl alcohol in Skellysolve B. These fractions were dissolved in boiling acetone and, on cooling, waxes precipitated. A free alcohol (melting point 85.0-85.5°C.) was obtained from the wax of the chlorophyll fraction by adsorption on magnesium oxide and elution of the alcohol with 2% acetone in Skellysolve B. The physical constants of the alcohol and its derivatives indicated it to be a mixture of n-triacontanol and n-octacosanol with the n-triacontanol predominating. The wax obtained from the carotene fraction was resolved into two components by fractional crystallization from Skellysolve B. The soluble portion was primarily paraffin while the insoluble portion was predominantly esters. The paraffins (melting point 66.5-67.0°C.) were purified by adsorption on magnesium oxide and elution with Skellysolve B. The composition of the paraffins approximated that of a mixture of C_{29} and C_{31} paraffins. Adsorption of the ester fraction on magnesium oxide indicated it to be a mixture of esters which was not resolved completely by this adsorbent. On saponification the esters yielded alcohols which were similar in composition to the free alcohols present in the alfalfa wax.

Wool wax. Part III. Synthesis of some iso-acids. F. W. Hougen, D. Ilse, D. A. Sutton and J. P. deVilliers (Nat. Chem. Res. Lab., Pretoria, S. Africa). *J. Chem. Soc.* **1953**, 98-102. 8-Methylnonanoic, 10-methylundecanoic, 12-methyltridecanoic, 16-methyl-heptadecanoic and 18-methylnonadecanoic acids have been synthesized. The melting points and long x-ray crystal spacings of the solid acids and amides have been measured.

Montanic acid and montanone. W. Presting (VVW Kohlewertstoffe, Halle [Saale]). *Chem. Tech.* **4**, 152-6(1952). The technical preparation of montanic acid (I), $C_{28}H_{56}O_2$, melting at 81-2°, from crude wax is described. Salts of I with heavy metals are prepared by heating the metal hydroxides or acetates with I to 140-65°. (In the following, the two temperatures are the congealing and drop points, respectively, of the salts): Fe(II) 88°, 97°; Fe(III) 95°, 100°; Cu(II) 115°, 145°; Pb(II)110°, 113°; I + 1% LiOH 119°, 123°; I + 1% NaOH 85°, 86°; I + 1% KOH 82°, 84°. Heating the Fe(II) salt to 210-50° gives montanone (II), $(C_{27}H_{55})_2CO$, congeals 97°, n^{100} 1.4384. Reduction of II with Na in EtOH gives montanol, $(C_{27}H_{55})_2CHOH$, melting at 97.5°, which is used as a nonionic emulsifier. Clemmensen reduction of II does not yield the hydrocarbon $C_{55}H_{112}$. Refluxing of I with Ac_2O gives montanic anhydride (III), melting at 86°, transformed only very slowly into I by boiling with H_2O. (*Chem. Abs.* **47**, 3230)

Flower wax of Citrus maxima (C. grandis). I. Unsaponifiable substances. Shungo Yasunaga. *J. Pharm. Soc. Japan* **72**, 869-71(1952). The flower wax was saponified with concentrated alcoholic KOH and the unsaponifiable matter fractionated by absorption of its petroleum ether solution through an AL_2O_3 column. The most readily adsorbed portion gave untriacontanol, leaves, melting at 80.5-1.5°, and sitosterol, plates, melting at 135-6°; the nonadsorbed portion gave triacontane, leaves, melting at 64-4.5°, nonacosane, leaves, melting at 62.5-3.5°, pentacosane, melting at 53-4.5°, and lupeol, needles, melting at 210°. The presence of an aromatic terpene alcohol (probably linaloöl or geraniol), b_{17} 110-15°, was shown in the alcohol-soluble part of both portions. (*Chem. Abs.* **47**, 3222)

Sinitiro Kawamura, Abstractor

Refining of rice wax by solvent extraction. II. Refining by methanol or by the mixed solvent of methanol and benzene. Junichi Kawai and Harue Ukiya (Bôsô Yushi Kôgyô K. K., Funabashi). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 794-6 (1952). Crude rice oil could be dewaxed by the use of the mixed solvent of methanol and benzene. Solvent purification of rice wax with high acid no. was easily done with methanol. These two solvent systems were comparable with acetone.

PATENTS

Organic acids, esters, and alcohols. Geza V. Austerweil (to Pechiney-Compagnie de produits chimiques et electrometallurgiques). *U. S. 2,604,482.* Insoluble organic anion-exchange resins are used to catalyze the hydrolysis of esters, transesterification of esters, and the isolation of naturally occurring alcohols that are a constituent part of oils, fats, or waxes. The resins are used in the basic state and are amine resins such as furfuraldehyde-m-$C_6H_4(NH_2)_2$ resin (I), especially those that are made tertiary or quaternary by treatment with, *e.g.*, Me_2SO_4. Good yields are obtained with H_2O or a suitable alcohol in excess of the stoichiometric proportions. Thus, to 100 grams essence of sweet lavender containing 55% linaloöl acetate is added 30 grams of an anion-exchange resin such as I or formaldehyde-aminoethylene-urea resin, or their quaternary amino products, the mixture refluxed one hour with 250 ml. H_2O, steam distilled, and the distillate worked up to give linaloöl; fractionation, yields 39 grams pure product, b_{10} 85°. (*Chem. Abs.* **47**, 3330)

Laminating glassine paper. Jacob I. Fisher and George C. Borden, Jr. *U. S. 2,610,939.* Improved lamination of glassine to glassine, to sulfite paper, or to foils and films was obtained by use of: amorphous microcrystalline petroleum wax 76-83; polymerized rosin ("polypale resin," Hercules) 12-19; a heavy viscous liquid polybutene (polybutene No. 64, Standard Oil Co. of New York) 2.5-3; and "butyl" rubber 2-2.5%. Use of this composition results in improved laminated paper characterized by good resistance to moisture and vapor penetration, high bond strength, good stability and aging properties, freedom from odor, light color, and good folding qualities. (*Chem. Abs.* **47**, 3567)

Beeswax derivatives. William C. Griffin (to Atlas Powder Co.). *U. S. 2,612,509.* Several light-tan, waxy solids, dispersible in warm H_2O, or hydrophilic, were prepared by treating the polyoxyethylene (6 or 20 oxyethylene groups per molecule) ether of sorbitol with beeswax and NaOH. Similar preparations were made from polypropylene glycol (molecular weight 750) or the polyoxyethylene derivatives of glycerol, wax, and NaOH. Pharmaceutical formulas are given for compounding cosmetic creams with these derivatives. (*Chem. Abs.* **47**, 3528)

Wax and silicone oil auto polish. Henry H. Cooke and Dominick Russo (to Standard Oil Development Co.). *U. S. 2,626,-870.* A wax emulsion polish of the oil-in-water type contains 0.001-5% by weight silicone oil with viscosity of less than 500 centistokes at 25°, 1-5% wax, 5-15% mild abrasive; 0.2-4% emulsifying agent, 3-25% hydrocarbon solvent for the wax, less than 1% water-soluble wetting agent, and the rest is water. (*Chem. Abs.* **47**, 3590)

Substitute for fat. Jean de Granville. *French 893,112.* Me and Et esters of phthalic acid alone or mixed with spermaceti, hydrogenated fish oils, waxes, or other materials are used as substitutes for fat in pharmaceuticals or perfumes. (*Chem. Abs.* **47**, 3530)

Bleaching of Japan wax. Takayoshi Wachi. *Japanese 5578 ('51).* Japan wax melted at 80° is mixed with the clear portion of a bleaching powder solution, heated to 100° with stirring, the excess HClO decomposed by adding $Na_2S_2O_3$, a small amount of HCl added, the upper wax layer emulsified with aqueous Na_2CO_3 at 60°, poured in cold H_2O, and the emulsion bleached in sunlight. (*Chem. Abs.* **47**, 3588)

A special wax from crude rice wax. Kozo Morii, *et al.* (to Nitto Chemical Industries Co.). *Japanese 5579('51).* Crude rice wax (200 g.), acid number 34, iodine number 52.2, saponification number 150, and H_2O 15%, is dehydrated, decolorized with clay, hydrogenated with Ni and H, heated with 10 grams liquid NH_3 in an autoclave one hour at 150°, the product washed with hot H_2O to give 120 grams hydrogenated wax, melting at 83-93°, acid number 4, iodine number 9.4. (*Chem. Abs.* **47**, 3588e)

Waterproofing agent. Rokusaburo Fujii. *Japanese 5586('51).* A mixt. of linseed oil 2, Japan wax 2, paraffin 6, and Al soap 1 is emulsified with aqueous "monobole" soap, casein, or higher alcohol sulfonate. The emulsion is stabilized by pressing out through a nozzle at 350-400 kg./sq. cm. It is used for waterproofing of textiles or paper. (*Chem. Abs.* **47**, 3578)

• Detergents

Lenore Petchaft, Abstractor

Compounded detergents. Dr. Donald Price (Oakite Products Inc., New York, N. Y.). *Soap, Sanit. Chemicals* **29**, No. 3, 54-5, 77(1953). The various types of cleaning which are improved by using built or compounded detergents are reviewed.

Anionic, cationic and non-ionic detergents. A. Taylor. *Perfumery, Essential Oil Record* **44**, 83, 120(1953). The history of the rapid growth of the use of synthetic detergents and the chemistry of the anionic, cationic and non-ionic detergents is reviewed.

Problems encountered in the manufacture of blue mottled soaps. E. P. Wood (Rhodesian Industries Co., Ltd., Salisbury, Southern Rhodesia). *Soap, Perfumery, Cosmetics* **27**, 359-60(1953). The preparation of blue mottled soaps is described. The pan charge can be made up to any of the common fats and oils provided that at least 20% of palm kernel oil or coconut oil is included. The soap is made in the conventional way, but finished as a coarse fit, so that no nigre separated out. After the lye has been drawn off, the soap content is estimated and the quantity of filling is calculated, and the blue coloring is added. As the soap cools, signs of mottling appear. The various theories for this blue mottling arre discussed, but none of the current theories appear to explain the phenomenon satisfactorily. It appears to be an entirely physical phenomenon, involving physical phases of identical chemical constitution to those found in toilet soaps.

Nonionics. Anon. *Chem. Week* **72**, No. 22, 52-5(1953). The newer uses for nonionic surfactants are reviewed. These include use as a dispersant in the "wet mixing" of phosphate rock, in wool scouring, metal cleaning, and in home laundry applications.

Colloidal and surface phenomena—soaps, micellar colloids, and solubilization. Geoffrey Broughton (University of Rochester, Rochester, N. Y.). *Ind. Eng. Chem.* **45**, 922-3(1953). The recent literature on soaps, micellar colloids, and solubilization as related to colloidal and surface phenomena is reviewed. 86 references.

Chemical structure and action of synthetic detergents. W. R. Gowdy. *Sewage and Ind. Wastes* **25**, 15-19(1953). Typical chemical structures of anionic, cationic, and nonionic synthetic detergents are given, and the mechanism of detergent action is discussed. The conclusion is drawn that detergents, in the concentration found in sewage, cannot alone be capable of causing frothing or settling problems. (*Chem. Abs.* **47**, 4532)

Colloidal electrolytes derived from olive oil. C. G. Herrera and R. G. Garcia. *Rev. cienc. apl.* (Madrid) **6**, 220-8(1952). Low-acidity oils from the dregs of crushed olives are sulfonated below 15° with 80% by weight 66° Bé. H_2SO_4. Detergency of these products measured by the method of Ringeissen is 80-5% that of Na oleate and Na_2CO_3 in distilled water. (*Chem. Abs.* **47**, 4633)

Powder type bleaches. Milton A. Lesser. *Soap, Sanit. Chemicals* **29**, No. 4, 154-5, 157, 159, 165(1953). Sodium perborate, the active ingredient in powder type bleaches, is an efficient bleaching agent for cotton, wool and most of the synthetic fabrics. It is safe for use on fabrics, easy on the hands and on washing equipment. Sodium perborate may also be used as a stain remover, in a combination soap or synthetic product, or as a sanitizing agent. 27 references.

Physical properties of detergents. G. Reutenauer. *Bull. mens. inform. ITERG* **7**, 14-21(1953). The redeposition of Fe_2O_3 alone or containing 4% 1:1 mixture of petrolatum and hydrogenated rape oil at 88° from solutions containing 0.25% of 14 different detergents is examined in the apparatus of Poliakoff. The order of effectiveness of the detergents for inhibiting redeposition of Fe_2O_3 is changed in the presence of cotton fabrics, but, with carbon black, inhibition of redeposition is the same with and without cotton in the solution. The effectiveness of commercial detergents for inhibiting deposition of Fe_2O_3 from distilled and tap water is recorded. (*Chem. Abs.* **47**, 4109)

Influence of rosin on yields in soap manufacture. G. Reutenauer. *Bull. mens. inform. ITERG* **6**, 529-35(1952). Soap solutions from more or less oxidized tallow (I) or I mixed with 40% of coconut oil were salted out and the losses by entrainment compared with those observed if part of the fats were replaced by rosin (II). If only 0.25% of oxidized acids (III) were present in the original fat mixture the addition of 10% of II reduces losses 1.1% with the 2 kinds of soaps against 0.6% without II. If 5% of III is present, losses are 6.3%; with 10% of II these are 5.2%. Five % of II has practically no influence, but 15% increases (1.5-2 times) the losses from soaps containing 0.5% of III and lowers them in the same proportion from soaps containing 5% of III. Different grades of II behave differently. Ten % of grade H, N, 7A, and X increased the losses in the presence of 2.5% of III from 3.5% (soap free of II) to, respectively, 4.1, 3.7, 4.5, and 4.6%; 6A and WW rosin reduce them to 2.9 and 3.2%. Detns. of unsapond. matter and III in the rosins concerned did not furnish an explanation of this different behavior. (*Chem. Abs.* **47**, 4109)

Analysis of synthetic detergents by infrared absorption technique. Philip Sadtler (Samuel P. Sadtler and Son, Inc., Philadelphia, Pa.). *ASTM Bulletin* **190**, TP 77-79(1953). The use of infrared absorption techniques in identifying various synthetic detergents is discussed. Characteristic spectra for the following types of compounds are given: fatty acids, fats, fatty acid soaps, alkyl sulfates, alkylarylsulfates, mahogany soap, cationic detergents and nonionics.

Some aspects of modern detergents. C. B. Stuffins. *Perfumery, Essential Oil Review* **44**, 128-33(1953). An outline is given of the history, classification and types of synthetic detergents. The properties are compared with those of soap and the functions of silicates and phosphates as builders are briefly stated. Some observations are made on the dermatological effects of the modern detergents in comparison with the action of soap. Analytical procedures for the estimations of active ingredient, phosphate, silicate, and sodium carboxymethylcellulose are reviewed. 26 references.

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The invert soap (cationic detergent) as a fungicide. II. Kanji Yamamoto and Shûichi Udagawa (Univ. Tokyo). *J. Agr. Chem. Soc. Japan* **26**, 589-94(1952)(Pub. 1953). The quaternary ammonium compounds synthesized, m.p.s., and the dilutions showing the same fungicide activity against the spores of *Gibberella fujikuroi* as that of 0.1% uspulum were, resp., *N*,*N'*-bis(dimethyl)-*N*,*N'*biscetyl-(*N*-ethylthio-*N'*-ethyl)-diammonium chloride, 219°, 10^3; dimethyldodecyl-β-thioethyl-ethylammonium chloride, 172°, 10^3; dimethylcetyl-β-thioethyl-ethylammonium chloride, 163°, 10^3; dimethylcetyl-β-thiophenyl-ethylammonium chloride, 154°, 10^3; dimethyldodecyl-β-thio (*p*-bromobenzyl)-ethylammonium chloride, 99°, 10^3; dimethylcetyl-β-thio(*p*-bromobenzyl)-ethylammonium chloride, 157-8°, 10^3; dimethyldodecyl-β-thio-(*o*-bromobenzyl)-ethylammonium chloride, 117°, 10^3; dimethylcetyl-β-thio(*o*-bromobenzyl)-ammonium chloride, 152-3°, 10^3; dimethyldodecyl-β-(*p*-bromobenzyl)-ethylammonium chloride, 115°, 10^3; dimethylcetyl-β-(*p*-bromobenzyl)-ethylammonium chloride, 180-1°, 10^3; dimethyldodecyl-β-thiobenzylethylammonium chloride, 115°, 5×10^3; and dimethylcetyl-β-thiobenzylethylammonium chloride, 191°, 10^3.

PATENTS

Noncaking alkyl aryl sulfonate detergent compositions. Allen H. Lewis (California Research Corp.). *U. S. 2,631,980.* A solid particle form of synthetic detergent, characterized by high resistance to caking at high humidity and temperature, is prepared by forming a slurry of monoalkyl benzene sulfonate detergent and an alkyl sulfate such as lauryl sulfate added to inhibit caking.

Alkylaryl sulfonate detergent composition. Jere C. Showalter and Albert J. Shmidl (Standard Oil Development Co.). *U. S. 2,634,240.* A detergent composition of improved detergency consists of from 10 to 60 weight per cent of alkali metal salts of xylene sulfonic acids, from 4 to 35 weight per cent of alkali metal salts of alkylaryl sulfonic acids having from 9 to 16 carbon atoms in the alkyl side chain, and from 30 to 60 weight per cent of a water soluble inorganic alkali metal salt.

Calcium hypochlorite detergent composition. Edward C. Soule (Mathieson Chemical Corp.). *U. S. 2,634,238.* A stable, dry detergent and hypochlorite composition especially useful as a rug cleaner and which is soluble in water is prepared by incorporating in a mixture of about 0.5 to 8 parts by weight of calcium hypochlorite containing upwards of about 50% available chlorine and about 5 to 20 parts by weight of a synthetic water soluble organic detergent such as sulfates, sulfonates and quaternary ammonium salts which do not produce an insoluble precipitate in the presence of calcium ions, about 5 to 20 parts by weight of a sodium polyphosphate, and about 3 to 20 parts by weight of finely divided potassium carbonate.

Detergent composition. John David Malkemus (Colgate-Palmolive-Peet Co.). *U. S. 2,634,239.* A detergent with improved detergency and excellent lime soap dispersing characteristics is prepared by the incorporation of a cationic surface-active agent of the type of aliphatic carboxylic acid monoester or monoether derivatives of a dialkanol piperazine with a fatty acid soap.

Detergent and method of making the same. Henry A. Molteni and Nathaniel H. Masarky and George Barsky (E. F. Drew & Co.). *U. S. 2,635,103.* A detergent product useful as a shampoo is prepared from the reaction product of 1 mole of a water-soluble hydroxyethylsulfuric acid salt with about 0.6 to 0.95 mole of a higher saturated fatty acid which is formed by heating the reactants at 200-300°C. at pressures below atmospheric and above 250 mm. in an inert atmosphere, decreasing the pressure, and removing the free fatty acid.