this case were higher than for the esters of the unpolymerized triglyceride fraction since the latter were of much lower viscosity. The figures for monomer : dimer ratios could be made more accurate by using larger quantities of material in the same-sized still.

The particular merits of the intra-molecular hypothesis have been that it attempts to explain time/viscosity and iodine value relationships during stand oil formation.

The characteristic shape of the time/viscosity curves obtained by bodying oil at constant temperature is however explicable if due consideration is given to the linear relationship reported (3, 7) to exist between the logarithm of the viscosity and the composition of stand oil mixtures. In this respect the fact that a pilchard stand oil of viscosity only 1.2 poises/29.5°C. contained no less than 35% of polymerized triglycerides is sufficiently striking. The difficulties attendant upon quantitative interpretation of iodine value decrease (even if these were accurate in themselves) in terms of polymer formation are formidable as has already been pointed out (4), and it still seems unlikely that the large ring formation necessitated by the intrapolymer hypothesis can predominate over intermolecular reaction.

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[Received January 20, 1953]

ABSTRACTS . . . . E. S. Lutton, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Rotocel extraction of cottonseed produces high quality oil and meal. Anon. *Chem. Proc.* 16(2), 60(1953). A brief description is given of a Lubbock, Tex., plant in which coarsely ground prepressed cottonseed meal is solvent extracted to produce a residual meal containing less than 0.5% oil.

The lipides of sebum. Anon. *Nutrition Reviews* 11, 39-40 (1953). Recent work on the composition of sebum, the secretion of the sebaceous gland of the skin, is reviewed.

Chromatographic separation of fatty acids. T. Asahara, Y. Konishi, Y. Kuroda and M. Mashino (Tokyo Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 70-2(1951). The separation of fatty acids has been carried out with calcined MgO, CaO, and Al_2O_3 as adsorption media. The combination of MgO and CaO gives better results than either alone. It is possible to separate the saturated fatty acids of 4-8 C atom difference, and the unsaturated acids of the same no. of C atoms but of different degrees of saturation. (*Chem. Abs.* **47**, 1407)

On the crystallization, structure and infrared spectra of saturated L-α-lecithins. E. Baer (Univ. Toronto). *J. Am. Chem. Soc.* **75**, 621-23(1953). A procedure is described by which it is possible to obtain L-α-(dimyristoyl)-, (dipalmitoyl)- and (distearoyl)-lecithins in a crystalline state. The elementary composition of the crystalline lecithins is in agreement with the formula:

$RCOOCH_2–RCOOCH–CH_2OPO(O^-H^+)OCH_2–CH_2N^+(CH_3)_3OH^-$.
The infrared spectra of the pure lecithins are reported.

Moringa acid oil (fatty acids from Ben oil) from East Africa. Miss H. Bennett, R. W. Pearman and W. D. Raymond. *Colonial Plant & Animal Products* 3, 55-57(1952). The sample of saponified Ben seed oil contained 80.8% free fatty acid (as oleic), and had an ester value of 30.7, iodine value 68.2, refractive index 1.449 and specific gravity (100°/18.8°) 0.8435. The fatty acids consisted roughly of 70% oleic, 4% linoleic acid and 22% saturated acids. The acid oil is useful in ore treatment as a collector for non-metallic materials.

The lipide composition during storage of human plasma, pooled, irradiated and dried. E. M. Boyd (Queen's Univ., Kingston, Ont.). *Can. J. Med. Sci.* 31, 84-93(1953). No loss of lipides in dried plasma occurred after storage at —40°, 4° or 20°; at 40° there was a 20% loss of lipides. Ultraviolet irradiation during processing did not affect the lipide composition of dried plasma determined before and after storage at 4°.

The dendê palm of Brazil. A. M. Cardoso. *Rev. brasil. quim.* (Sao Paulo) 33, 232-8(1952). The properties, chemical composition, and uses of the oil of the dendê palm (*Elaeis guineensis* or *E. melonococca* are discussed. (*Chem. Abs.* **47**, 890)

Chemistry of fats of fresh-water fish. III. Composition of fat in tissues of Perca schrenki. M. N. Chechenkin (State Pedagog. Inst., Pskov). *Zhur. Obschei Khim.* (J. Gen. Chem.) 22, 1244-53(1952). In fats from all parts of *P. schrenki* there were found unsaturated acids with 4-5 double bonds. The acid composition of fats from the body, head, entrails, and roe is very similar, but the fat from the liver has higher levels of very highly unsaturated acids. The most typical acid is terapinic acid, $C_{18}H_{28}O_2$, comprising up to 15% of the total of all tissue fats; arachidonic acid, $C_{20}H_{32}O_2$, ranges up to 5%. In the liver the typical acid is clupanodonic acid, $C_{22}H_{34}O_2$ (up to 15%), as it is in *P. fluviatilis.* Oleic acid is the prevalent constituent of all the body fats. *P. schrenki* does not appear to carry in its fat any detectable amounts of linoleic and linolenic acids. (*Chem. Abs.* **47**, 786)

Avocado-oil, properties and uses in cosmetics. Helmut Führer. *Seifen-Ole-Fette-Wachse* 79, 14(1953). Avocado oil resembles olive oil closely in its constants and on account of its sterol and vitamin content it possesses specific properties which make it particularly suitable for cosmetic purposes.

Determination of iodine number of fats in aqueous medium. A. I. Gengrinovich and E. A. Yudovich (Tashkent Pharm. Inst.). *Aptechnoe Delo* **1952**, No. 5, 17-22. The iodine nos. of a variety of fats were satisfactorily determined in 0.2 *N* HCl aqueous medium by means of ICl solution. The results are within 0.3 unit of the conventional method. (*Chem. Abs.* **47**, 887)

Autoxidation of fats. Formation of hydrogen peroxide. E. Glimm, E. Seeger and J. Boetcher. *Fette u. Seifen* **54**, 462-7 (1952). Kr light or sunlight, and presence of polyunsaturated acids accelerate, whereas darkness inhibits, autoxidation. At maximum peroxide value, the acid no. and saponification no. have risen and the iodine no. dropped to the value of the thiocyanogen no. When oxidation takes place in absolutely anhydrous fats, traces of water are split off which are necessary to the reaction. The keeping qualities of butter can be improved by heating to 80° for several hours to destroy the lipases, oxidases, etc., normally present. (*Chem. Abs.* **47**, 887)

Metals in oils: their determination by spectrographic methods and the errors involved. A. J. Ham, J. Noar and J. G. Reynolds (Thornton-le-Moors Chester, Engl.). *Analyst* **77**, 766-73

(1952). Clear oils require no preliminary treatment before determining soluble metals but used oils are best clarified by centrifuging or filtering. Take 0.15-1 ml. sample in a glass thimble, soak two 1-in. graphite electrodes in the oil, subject to a spark discharge and, without presparking, measure the spectral lines in a Hilger Medium Quartz spectrograph and determine the contents nomographically. The concentration ranges found were 0.005-0.3% P, 0.007-0.3% Zn, 0.005-0.3% Ca, Pb, and Ba, 0.0003-0.01% Cu, and 0.005-0.01% Fe. The accuracy, except for Pb, is comparable to that of routine chemical methods. The spectral lines used are given. (*Chem. Abs.* **47**, 997)

Constitution of the hydroxy acids of wool wax. D. H. S. Horn, F. W. Hougen and E. von Rudloff (Nat. Chem. Res. Lab. Pretoria, So. Africa). *Chemistry & Industry* **1952**, 106. The acidic fraction of wool wax extracted from Merino fleece contains nearly 30% hydroxylated fatty acids. Of the hydroxy acids 0.6, 3.8, 18.8 and 4.6% were respectively *n*-*a*-hydroxylauric, -myristic, -palmitic and -stearic acid. The presence of considerable quantities of 16-methyl-2-hydroxyheptadecanoic acid has been deduced.

The hydrogenation catalysts for oils. I. The constituents of the spent catalyzers. F. Imada (Kyushu Univ., Fukuoka), *Kogahu Iho, Kyushu Univ.* (Technol. Rept., Kyushu Univ.) **20**, 105-9(1949). Adhering matter on spent hydrogenation catalysts was analyzed. Unsaponifiable oil matter isolated from the catalyst is believed to come from the crude-oil sludge. Adsorption of these materials on the active centers of the catalyst is thought to be the primary reason for aging. (*Chem. Abs.* **47**, 1408)

The hydrogenation catalysts for oils. II. The preparation of catalyzers from the spent catalyzers and the hydrogenation study. F. Imada (Kyushu Univ., Fukuoka). *Kogaku Iho, Kyushu Univ.* (Technol. Rept., Kyushu Univ.) **21**, 1-3 (1949). Since the soluble metal oxide components in diatomaceous earth play a role as promoters, the addition of new diatomaceous earth is found to be advantageous, as diatomaceous earth in recovered catalysts no longer has such components. The recommended procedure for the preparation of recovered catalysts is described. (*Chem. Abs.* **47**, 1408)

The hydrogenation catalysts for oils. III. Chemisorption and catalytic activity. F. Imada (Kyushu Univ., Fukuoka). *Kogaku Iho, Kyushu Univ.* (Technol. Rept., Kyushu Univ.) **21**, 14-27(1949). The sorption ability for H_2 and C_2H_4, and hydrogenation properties of catalysts of Ni, Al-Ni, Cu-Ni, Fe-Ni, Ni-Fe-Al, with or without diatomaceous earth and activated C are compared. (*Chem. Abs.* **47**, 1408)

Boiling points of fat acids. E. Jantzen and W. Erdmann (Chem. Staatsinst., Hamburg, Ger.). *Fette u. Seifen* **54**, 197-201(1952). The boiling points at reduced pressures of all normal saturated fat acids were investigated. The vapor pressure of myristic acid was determined at pressures between 0.03 and 0.7 mm., and the data obtained were used to calculate data for other acids by use of the Dühring rule. A graph of boiling point against pressure is given for fat acids from C_1 to C_{30}. The apparatus used for the vapor pressure measurements is described in detail. (*Chem. Abs.* **47**, 371)

Edible Karite butter. J. Jorand. *Oleagineux* **8**, 15-18(1953). Details are given of the steps used in preparing Karite butter of a suitable grade for food processors. A method is also described for preparing a latex free grade of the fat suitable for use in the soap industry.

Isolation of lipide substances from mechanically disintegrated tubercle bacilli. S. Kashihara. *Ann. Tuberc.* (Nara, Japan) **2**, 15-17(1951). More lipides and $CHCl_3$-soluble matter were isolated from mechanically disintegrated tubercle bacilli by subsequent extraction for 24 hours with organic solvents (alcohol or $CHCl_3$) than from normal bacilli. (*Chem. Abs.* **47**, 1224)

Paper chromatography in the field of fats. XIV. Examination of polymerized oils. H. P. Kaufmann and J. Budwig (Chem. Landesuntersuchungsamt Nordrhein-Westfalen, Munster/Westfalen, Ger.). *Fette u. Seifen* **54**, 348-56(1952). Paper chromatography was applied to polymerized and nonpolymerized fish oils. The thermal polymerization of fish oils results in a decrease of highly unsaturated fat acids; some multiply unsaturated acids remain, however. Nonpolymerized fish oils contain conjugated acids and dimers. The frequent cloudy appearance of fish oils appears to be due to the presence of lipoproteins. (*Chem. Abs.* **47**, 885)

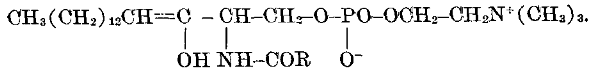
The determination of cholesterol by the Liebermann-Burchard reaction. A. P. Kenny (Victoria Infirmary, Glasgow). *Biochem. J.* **52**, 611-19(1953). Factors influencing the color development in the Liebermann-Burchard reaction have been investigated. A method for the estimation of serum or plasma total cholesterol suitable for routine clinical work has been evolved by measuring the yellow component of the color and employing a filter having a maximum transmission at 430 mμ.

Studies on the preparation of higher fatty alcohols by catalytic hydrogenation. I. Catalytic actions of zinc powder and binary metallic oxides. A. Kobashi, S. Hayano, H. Iijima and Y. Oinuma (Kao Oil and Fat Co., Tokyo). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 145-6(1951). Preparation of unsaturated fatty alcohols from soybean oil, its methyl ester and rice-bran oil by hydrogenation at 300° and 100 atmospheres in the presence of Zn powder or metallic oxides was studied. Zn powder did not give satisfactory results. Fe-Zn-O and Zn-Al-O mixed catalysts were good for industrial purposes. With use of these catalysts soybean oils were converted to alcohol products of acetyl no. 153.2 and 128.5 respectively. (*Chem. Abs.* **47**, 1407)

Separation of oil from sesame seeds by displacement with water. C. H. Lou, L. F. Yen, K. H. Lou, C. Y. Yang and S. Y. Fu (Peking Univ. Agr.). *Science Record* (China) **3**, 203-7(1950). In this small-scale process which has been used in North China for at least 300 years, the seeds are thoroughly roasted, reduced to a smooth paste in a fine burr mill, an almost equal weight of water is added, and the mixture is stirred until the oil is displaced from the glutinous matter of the seeds by the water. Shaking then causes formation of a distinct, easily removed layer of oil on top of the wet residue. Yields of sesame oil by this process compare favorably to yields by mechanical expression. (*Chem. Abs.* **47**, 890)

Volumetrical determination of glycerol with potassium permanganate. Maria Marconi (Univ. Florence). *Chimica* (Milan) **7**, 336-8(1952). The volumetrical titration of glycerol with $KMnO_4$ can be used in solutions containing small amounts of glycerol. Some suggestions are given for the defecation of residual solutions of soap manufacturing, of wines, vinegars, etc. Glycerol is oxidized with an excess of $KMnO_4$, and the excess is titrated with oxalic acid. (*Chem. Abs.* **47**, 1008)

Studies on the structure of sphingomyelin. II. Performic and periodic acid oxidation studies. G. Marinetti, J. F. Berry, G. Ronser and E. Stoty (Univ. Rochester, Rochester, N. Y.). *J. Am. Chem. Soc.* **75**, 313-315(1953). Pure sphingomyelin from beef brain was analyzed. Its structure was deduced to be



$$CH_3(CH_2)_{12}CH{=}\underset{OH}{\underset{|}{C}}-\underset{NH-COR}{\underset{|}{CH}}-CH_2-O-\underset{O^-}{\underset{|}{PO}}-OCH_2-CH_2N^+(CH_3)_3.$$

Estimation of argemone oil in mustard oil by the bromide-bromate test. S. N. Mitra, S. C. Chakravarti and A. B. Som (India Inst. of Hygiene and Public Health, Calcutta). *Science and Culture* **17**, 522-3(1952). Extract 10 cc. of oil with 4 cc. of concentrated HCl with heating; add 0.4 cc. of $KBr-KBrO_4$ solution, and let stand 2 hrs. An orange to red color develops with increasing concentration of argemone oil. (*Chem. Abs.* **47**, 890)

Deterioration in frozen pork as related to fat composition and storage treatments. A. Z. Palmer, D. E. Brady, H. D. Naumann and L. N. Tucker (Univ. Missouri, Columbia). *Food Tech.* **7**, 90-5(1953). The keeping quality of frozen ground pork declined with a decrease in the saturation of pork fat. This deterioration was most marked at temperatures above 0°F. and when packaged in inferior oxygen-moisture vapor barrier materials.

An antarctic fish oil. The oil from Notothenia rossii mamorata. T. Pedersen (Sandar Fabrikker A/S, Sandefjord, Norway). *Saertrvkk av Tidsskr. Kjemi, Bergvesen Met.* **5**, 83-85(1952). Characteristics of the oil from the "South Georgia Cod" (*Notothenia rossii mamorata*) are iodine no. (Wijs) 148, saponification no. 193, acid no. 4.04, unsaponifiables 1.0%. The fatty acids from this oil consist of 0.2% C_{12}, 10.0% C_{14}, 13.8% C_{16}, 4.5% C_{18}, 0.6% C_{14} (—2.0 H), 15.1% C_{16} (—2.6 H), 28.4% C_{18} (—3.0 H), 17.1% C_{20} (—8.0 H) and 10.3% C_{22} (—9.2 H).

Losses in the neutralization of babassu oil. G. P. Pinto (Inst. agron. Norte, Belem). *Bol. tec. inst. agron. norte* (Belem, Brazil) No. 22, 37-48(1950). Results obtained in the A.O.C.S. refining test for oils are used to derive equations relating the percentage loss (y) and weight of soap stock obtained (z) in the neutralization of babassu oil of x% acidity (as oleic acid): $y = 0.8 + 2.3\ x$; $z = 0.60 + 3.50\ x$. (*Chem. Abs.* **47,** 889)

Comprehensive resumé. The application of antioxidants. Hildegard Raeithel (Inst. Lebensmittel-technol., Munich, Ger.). *Z. Lebensm.-Untersuch. u.-Forsch.* **95,** 246-62(1952). The subject is thoroughly reviewed. 145 references. (*Chem. Abs.* **47,** 1408)

The thermal behavior of milk fat in rapidly cooled cream. A. H. Rishoi (Cherry-Burrell Corp., Chicago, Ill.). *J. Dairy Sci.* **35,** 1125-29(1952). The heat of solidification of milk fat in winter cream, cooled rapidly from 30° to various temperatures down to 0.08°, was measured. The maximum value (at 0.08°) was found to be 18.7 calories/g.

Rice-bran oil. III. Hardening of rice-bran oil and wax with nonreduced nickel-copper catalyst. Acid refining of wax and the production of hardened wax of high melting point. H. Sakurai (Osaka Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54,** 87-9(1951). Rice-bran oil or wax is washed with dilute HCl or H_2SO_4 at 90° for 30 min. This aided hydrogenation carried out at 30-60 atmospheres in the presence of Ni-Cu oxide catalyst. (*Chem. Abs.* **47,** 1409)

Rice-bran oil. IV. Hardening of rice-bran oil of high acid value with nonreduced nickel-copper catalyst. H. Sakurai (Osaka Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54,** 89-91(1951). The hydrogenation of free fatty acid with catalysts rich in Cu is retarded in oil of high acid value. Metallic soap is formed. (*Chem. Abs.* **47,** 1409)

Chemical examination of the fatty oil from the seeds of Luffa amara. K. S. Siddalingiah, S. Siddappa and H. S. Jois (Central Coll., Bangalore). *Half-Yearly J. Mysore Univ.* **12B,** 121-8(1952). Petroleum ether extraction of *Luffa amara* seeds yielded 18.4% reddish brown oil having the following constants: specific gravity (30°/30°) 0.9131, n^{25} 1.4730, acid no. 18.41, acetyl no. 11.62, saponification no. 192.7, iodine no. (Hanus) 105.3, Reichert-Meissl no. 0.26, Hehner no. 89.30, unsaponifiable 1.5%. Hydrolysis of the oil gave saturated acids 19.34% and unsaturated acids 80.3% which were characterized by the usual procedures as palmitic, stearic, oleic, and linoleic acids and a trace of lignoceric acid. (*Chem. Abs.* **47,** 890)

Some new metallic compounds of unsaturated fatty acids: their preparation and properties. J. H. Skellon and J. W. Spence (Acton Tech. College, London, W. 3). *J. Appl. Chem.* **3,** 10-14(1953). Pure uranium, thorium, cerium and cobalt salts were prepared from oleic, elaidic, brassidic, ricinoleic, ricinelaidic, petroselinic and petroselaidic acids. Salts of the *trans* acids seem to be less active than the *cis* acid salts as catalysts in the initial stages of autoxidation.

Partition chromatography of fat-soluble substances. J. Spiteri and G. Nunez. *Compt. rend.* **234,** 2603-4(1952). A scheme was worked out for the separation of higher fatty acids, chlorophylls, carotenes, vitamins, sterols, terpenes, higher alcohols, hydrocarbons, etc., by impregnating filter paper with triglycerides and using as a carrier methanol, ethanol, or propanol; the latter was found to be the best. The position of the different components was revealed by treating the paper with ammoniacal Ag solution; the fixed Ag was transformed into AgCl and finally into black stains of Ag_2S. Examples are given of results obtained with lauric, myristic, oleic, palmitic, and stearic acids with olive oil to impregnate the paper, and different concentrations of ethanol as the carrier. (*Chem. Abs.* **47,** 941)

Research on the polymorphism of some natural fats. III. The dilatometric study of cocoa butter. S. V. Vaeck. *Revue Internationale de la Chocolaterie,* No. 11, 1-7(1952). Variation in the volume of cocoa butter were studied as a function of temperature over the interval of —30°C. to 50°C. The curves of the expansion of fusion are practically identical with the curves of enthalpy of fusion. The ratio enthalpy of fusion/expansion of fusion is not however, completely constant for the different polymorphic forms as required by the law of Bailey. The expansion of fusion for the stable (beta) form is 0.0970 ml./g. which is much larger than previously was thought.

Component fatty acids and glycerides of soybean oil. T. A. Venkatasubramanian (Indian Inst. Sci., Bangalore). *J. Sci. Ind. Research* (India) **11B,** 132-4(1952). The distribution of fatty acids in the glycerides in GS_2U 14.6, GSU_2 12.52, and GU_3 72.9%, wherein G represents glycerol radical, S saturated, and U unsaturated fatty acids. (*Chem. Abs.* **47,** 1409)

Extraction of soybean oil with ethyl alcohol. S. C. Wen. *Chinese Chem. Ind. Eng.* **1,** No. 1/2, 27-32(1950). For optimum extraction of soybean oil from soybean meal with ethanol, the concentration of the alcohol must be greater than 95% and the moisture content of the soybean meal less than 1%. The efficiencies of extraction on varying the amount of alcohol, the concentration of alcohol, the particle size of the meal, the no. of extractions, and the time of extraction are tabulated. (*Chem. Abs.* **47,** 1409)

Distinction between virgin and refined oils. Olive oil and almond oil. G. Wolff and J. P. Wolff. *Bull. mens. inform. ITERG* **6,** 379-83(1952). Ultraviolet absorption spectra were determined in solutions containing 10 g. of oil in 1 l. of cyclohexane with a spectrophotometer (Jobin & Yvon) and a luminous purity of 10 Å. Deodorization significantly reduced transparency of virgin olive oil. Exclusion of air during deodorization decreases these values, but the increase in opacity is still considerable. Pressed virgin almond oil, colza oil, and linseed oil showed similar behaviors. For cacao butter the increase in opacity as a consequence of heat treatment is less important. It is very low for coconut oil. Additions of 3-4% of refined or extracted oil to virgin olive oil could be detected by optical means at 270 mμ but application to other oils will depend on the knowledge of the optical behavior of the virgin oils (*Chem. Abs.* **47,** 1409)

Sinitiro Kawamura, Abstractor

Application of sulfonic acids containing lipophylic group. Kazuo Fukuzumi (Nagoya Univ.). *J. Oil Chemists' Soc., Japan* **1,** 181-8(1952). A review with 25 references, chiefly on the author's work. Application includes fat-splitting detergency, ore floatation, and antiseptic action. The compounds studied are dodecyl (and cetyl)-phenolsulfonic acid, its halogen derivatives, alkylnaphthalenesulfonic acids, and some products from naphthalene, 2,2-binaphthyl, butanol, and H_2SO_4.

Antioxidants (for lipides). Saburô Komori (Osaka Univ.). *J. Oil Chemists' Soc., Japan* **1,** 189-98, 210(1952). A review with 53 references.

Preparation of unsaturated higher alcohols. XV. Hydrogenolysis of lead soaps of sperm oil fatty acids. Saburô Komori, Yoshihiro Shigeno, and Ichirô Yoneda (Osaka Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55,** 680-2(1952). Na soaps of sperm oil fatty acids, by-product of the higher alcohol manufacture from sperm oil, was converted to Pb soaps by double decomposition with Pb nitrate. The Pb soaps were hydrogenolyzed with H_2 of initial pressure of 100 atm. at 315° to yield 85.1% higher alcohols. Direct saponification of sperm oil with Pb oxide or Pb hydroxide and simultaneous hydrogenolysis was not suitable as the method for preparing higher alcohols.

Fatty acids. VI. Monomolecular films of monoesters of oleic acid. Senjirô Maruta (Yamanashi Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55,** 674-6(1952). The surface pressure and area of monomolecular films of oleic acid, oleyl alcohol, ethyleneglycol monoöleate, glycerol monoöleate, and mannitan monoöleate were measured on aq. 20% NaCl soln. and on H_2O. The situations of polar groups on NaCl soln. or H_2O were discussed. The monomolecular films of the compounds with more atoms in the polar group and larger volume were more compressible than those with less atoms in the polar group and smaller volume.

Lauryl naphthenates. Shizuo Noguchi and Hirouyasu Andô (Nippon Petroleum Co.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55,** 676-7(1952). Chem. structure of naphthenic acid influenced the anti-freeze and other properties of the lauryl naphthenates prepared. Naphthenic acid from naphthenic oil of higher density and higher refractive index was better than that from paraffinic oil of lower density and lower refractive index. The products are suitable as synthetic lubricating oils for precision instruments.

Addition of unsaturated fatty acids to maleic anhydride. I. Separation of oleic acid and preparation of plasticizer from distilled fatty acids of rice-bran oil. Yoshihiro Shigeno, Saburô Komori, and Kazuo Kataoka (Osaka Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55,** 739-42 (1952). Liquid fatty acids of rice-bran oil (or their Me esters) (100 parts) with 50-150 parts maleic anhydride heated 1-3 hrs. at 190-250° under CO_2 stream gave oleic acid of 96-98% purity (yield 21-34%) after vacuum distillation following the recovery of unreacted maleic anhydride. The residual oil from the oleic acid portion was converted to Me or Bu ester; the distillate boiling at 260° at 10^{-3} mm. Hg. could serve after hydrogenation as the plasticizer for polyvinyl chloride resin better than dioctyl phthalate.

Hydrogenation of linoleic acid. II. Hydrogenation of methyl linoleate. Tomotarô Tsuchiya and Osamu Okubo (Govt. Chem. Ind. Research Inst., Tokyo). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 743-4(1952). Hydrogenation of Me linoleate at 180° with Ni catalyst was not selective, as indicated by thiocyanogen no. and iodine no.; the formation of Me stearate began when there was a considerable amount of Me linoleate. The octadecenoic acid formed by partial hydrogenation of Me linoleate was a mixture of isomers, among which Δ^9- and Δ^{12}-octadecenoic acids were presumed to be.

PATENTS

Soya bean oil and method of producing the same. C. M. Gooding (The Best Foods, Inc.). *U. S. 2,627,467.* A hydrogenated and winterized soya bean oil is claimed for use as a salad oil having an iodine number of 100 to 120 and containing less than 1% of conjugated dienoic acid components, less than 0.02% of conjugated trienoic acid components, and less than 0.002% of conjugated tetraenoic acid components.

Soya bean oil and method of producing the same. H. W. Vahlteich, C. M. Gooding and D. Melnick (The Best Foods, Inc.). *U. S. 2,627,468.* A hydrogenated and winterized soya bean oil suitable for use as a salad oil is claimed having an iodine number of 100 to 120 and containing less than 5% of conjugated dienoic acid components, less than 0.2% of conjugated trienoic acid components and less than 0.02% of conjugated tetraenoic acid components.

Soya bean oil compositions. D. Melnick, C. M. Gooding and H. W. Vahlteich (The Best Foods, Inc.). *U. S. 2,627,469.* An edible glyceridic oil composition is claimed comprising a vegetable salad oil having an iodine number of less than 120 and a hydrogenated and winterized soya bean oil having an iodine number of 100 to 120 and containing less than 5% of conjugated dienoic acid components, less than 0.2% of conjugated trienoic acid components and less than 0.02% of conjugated tetraenoic acid components.

Distillation of fatty acids, tall oil, and the like. R. H. Potts and R. N. Olson (Armour and Company). *U. S. 2,627,500.* In a process for treating fatty acids and tall oil, the steps are claimed of subjecting the material to be distilled to a plurality of separate distillation operations, condensing vapors from a plurality of distillation operations, withdrawing a portion of the condensate, passing steam in a plurality of streams past the zones and in open communication with the condensing zone thereof, and passing each of the streams into the preceding distillation zones.

Stabilized aqueous fatty compositions. Betty M. Watts and H. V. Moss (Syracuse Univ.). *U. S. 2,629,664.* A composition of matter comprising an aqueous phase and a fatty phase and about 0.005% to about 1% by weight of a mixture of a phenolic antioxidant and a normal molecularly dehydrated alkali phosphate having the formula $M_2O \cdot P_2O_5$ in which M is an alkali metal selected from the group consisting of sodium and potassium and the molar ratio M_2O to P_2O_5 is in the range of 1:1 to 1.7:1.

Sulfurized fatty and waxy materials. C. J. Sunde (N. I. Malmstrom & Co.). *U. S. 2,629,721.* A process of making leaded sulfurized saponified degras is claimed which comprises heating wool grease to about 270° to 280°F. in the presence of about 10% caustic soda for about one hour, the caustic soda being in a concentrated solution in a minimum amount of water, drying the hot reaction mixture by adding it to a lubricant oil and blowing with hot air at a temperature of about 285°F. About 100 to 125 parts of the reaction mixture is placed in about 75 parts of the mineral oil, then is mixed with a slurry of about 23 parts of phosphorous pentasulfide and 25 parts of mineral oil and maintained with stirring at a temperature of 285° to 300°F. The sulfurized saponified wool grease is treated with a solution of lead acetate at a temperature of about 200 to 212°F. and the acetic acid removed.

Method of cooking oil bearing vegetable seeds and nuts. J. W. Dunning (The V. D. Anderson Co.). *U. S. 2,629,722.* A method of treating oil bearing seed and nut meats prior to extraction of the oil therefrom is claimed, comprising raising the moisture content of the meats to a value between 12% and 20%, and cooking the meats for a period between 7 and 20 minutes at a temperature of between 190°F. and 215°F. under such conditions that evaporation does not reduce the moisture in the seed or nut meats below 12%.

Halogen fatty acids. Steirische Chemie A.-G. (I. Morghen and K. Chalupny, inventors). *Austrian 173,230.* Fatty acids are halogenated with gaseous halogens in the presence of ultraviolet light and of catalysts, e.g. elements of the 5th-7th group of the periodic table or compounds of such elements. (*Chem. Abs.* **47**, 894)

Fractionation of mixtures of organic compounds of differing degrees of unsaturation. N. V. de Bataafsche Petroleum Maatschappij. *Brit. 665,248.* Saturated straight-chain fatty acids or their esters are separated from their mixtures with other components of varying degrees of unsaturation by the formation of addition compounds, called "clathrates," with urea, preferably in the presence of an alcohol or ketone. The acid is recovered by decomposing the clathrate in a large volume of water at elevated temperature. Mixtures of amines, amides, nitriles, esters, alcohols, aldehydes, or ketones having varying degrees of unsaturation may be fractionated by this method. (*Chem. Abs.* **47**, 602)

Hydrogenation of highly acidic fats or oils or fat acids. H. Higashi and S. Izeki. *Japan. 2324('51).* A crude rice oil (iodine no. 104 and acid no 56.4) is treated with 5% activated acid clay, filtered, and the oil is hydrogenated with 4% Raney Ni with normal pressure of H and at 100-180° for 1.5 hours to give a product having iodine no. 60 and m.p. 48°. (*Chem. Abs.* **47**, 895)

Dewaxing of rice oil. T. Yamagiwa and K. Yoshida (Kawaguchi Chemical Industries Co.). *Japan. 2424('51).* Rice oil is dewaxed in a trichloroethylene-methanol system. (*Chem. Abs.* **47**, 896)

Removing of acid from fats and oils by use of mixed solvent. R. Koyama. *Japan. 3032('51).* Fractionation takes place in a 76% methanol, 15% ethanol, and 9% water solution. (*Chem. Abs.* **47**, 895)

Barium sulfate-copper oxide catalyst for the preparation of an unsaturated oil of the oleic acid series by selective hydrogenation. R. Miyake, *et al.* (Nippon Marine Industries Co.). *Japan. 3077('51).* Hydrogenation of whale oil (iodine no. 110 and 19% saturated acid) with $CuO \cdot BaSO_4$ catalyst at atmospheric pressure and 180° gives a product of iodine no. 72, containing 19% saturated fat acid and having no fat acid that forms a petroleum ether-ether-insoluble bromide. (*Chem. Abs.* **47**, 895)

Hydrogenation of marine-animal oil. R. Miyake, *et al.* (Nippon Marine Products Co.). *Japan. 3078('51).* Kieselguhr (100 g.) and 40 g. $CuSO_4 \cdot 5H_2O$ were treated with hot water, the mixture was evaporated to dryness on a water bath, 130 ml. 10% NaOH was added, and the precipitate was filtered, washed with water, and dried. Ten g. of this Cu on Kieselguhr catalyst and 500 g. whale oil (iodine no. 110, saturated fat and unsaturated solid fat acid 24.2%) were treated with H at the rate of 10 l./hr., for 20 minutes at 170° and then at 210° with agitation of 200 rotations/minute to give a product of iodine no. 89, containing 27.2% saturated and unsaturated solid acid, and having no fat acid that formed ether-insoluble bromide. (*Chem. Abs.* **47**, 895)

Hydrogenation of unsaturated fat acid salt. S. Ueno, *Japan. 3079('51).* Fish-oil Na soap is heated in an autoclave with 5% Ni Cu carbonate (Ni:Cu = 1:1) without a carrier with H at 50 atmospheres and at 180-200° for 1 hr. to give an odorless hard soap. (*Chem. Abs.* **47**, 895)

Refining of olive oil. P. M. Sampedro. *Span. 199,056.* The oil is first agitated with air and then given a thorough water wash, which is followed by treatment with heat. The temperature depends on the impurities to be removed. (*Chem. Abs.* **47**, 896)

• Biology and Nutrition

R. A. Reiners, Abstractor

Effect of dietary fats and oils on adrenal cholesterol. K. K. Carroll (Univ. of Western Ontario, London, Can.). *Endocrinology* **48**, 101-10(1951). The increase in size and lipide content of rat adrenals produced by feeding a diet containing 25% of rapeseed oil is the result of cholesterol deposition caused by a factor in this oil. Most of the extra cholesterol is in the esterified form and is confined to the adrenal cortex. Rutabaga-seed oil produced a similar effect; the common animal and vegetable oils had very little such effect. The diet containing rapeseed oil also caused a marked increase in the esterified cholesterol content of the liver, but not in various other tissues or in the blood. The effect on adrenal cholesterol was not seen in hypophysectomized rats. (*Chem. Abs.* **47**, 1249)

Concept of equilibrium of the fat-soluble vitamins. A. Chevallier and Ch. Lausecker (Faculte med., Strasbourg, France). *Intern. Z. Vitaminforsch.* **24**, 99-108(1952). In the diet, the concept of equilibrium extends not only to the calorific constituents but also to the vitamins. The toxicity of calciferol is greatly modified by the presence in the diet of a lipide, probably a fatty acid; milk contains little of this antagonistic factor. The toxicity of fish oils is neutralized by tocopherol and a series of reducing compounds. (*Chem. Abs.* **47**, 1250)

Fatty acid esters with ethylene glycol put on the market to substitute for natural fats. W. Ciusa. *Boll. lab. chim. provinciali* (Bologna) 2, 105-7(1951). The substitution for glycerol with ethylene glycol for the esterification with fatty acids is considered adulteration. A method for determination of ethylene glycol esters is described. (*Chem. Abs.* **47**, 888)

The composition of dietary fat in relation to liver-fat deposition on low-protein diets. M. Damodaran and C. S. Raman (Natl. Chem. Lab., Poona). *Indian J. Med. Research* **39**, 465-72(1951). Butterfat and coconut oil, at levels of 15 and 25% in the diet, caused marked infiltration of fat into the liver of rats maintained on low protein (5% rice protein) diets. Mustard oil and sesame oil (15% levels) had no influence on liver fat. Growth was subnormal on all low-protein diets regardless of the fat component. Butterfat depressed growth most and coconut oil least. Fractionated fatty acids of butterfat were also fed at 15% levels in the low-protein diet for 35 days. The steam-volatile, short-chain saturated acid fraction and the liquid, unsaturated acid fraction were well absorbed and did not induce fatty livers. The solid, long-chain fatty acid fraction was only 71.3% absorbed, yet it more than doubled the fat content of the liver over that of controls. (*Chem. Abs.* **47**, 711)

The relative effectiveness of vitamins A and D in oil and water. R. C. Ellingson, F. G. McDonald, O. M. Massengall and W. H. Cox (Mead Johnson Co., Evansville, Indiana). *Pediatrics* **8**, 107-16(1951). When small doses of vitamin A (1, 2, 3, or 10 units) were given in water solution, emulsion, or oil solution to vitamin A-deficient rats, weight gain and improvement in xerophthalmia were equal at comparative levels. When single doses of vitamin A (14, 28, 56, 84, or 140 units) of the same preparations as above were fed to deficient rats, no differences in weight gain or survival of comparative groups were noted. Liver storage was equal when like amounts of vitamin A were fed in water and oil solutions, though at higher doses the water solution showed better results. (*Chem. Abs.* **47**, 706)

The mechanism of fat absorption. A. C. Frazer (Univ. Birmingham, Engl.). *Biochem. Soc. Symposia* No. **9**, 5-13(1952). A review was made in order to compare the Pflüger-Verzar or "lipolytic hypothesis" that fat absorption could not occur unless the glyceride molecule was completely hydrolyzed to fatty acid and glycerol, and the Frazer or "partition hypothesis" which indicated that hydrolysis of long-chain fats was not complete, emulsification was important, phospholipide was not a necessary intermediate, etc. It is concluded that the latter hypothesis is compatible with the facts presently available. (*Chem. Abs.* **47**, 730)

Aspects of fat metabolism in the ruminant with special reference to the biosynthesis of milk fat. S. J. Folley (Univ. Reading, Engl.). *Biochem. Soc. Symposia* No. **9**, 52-65(1952). A review with 45 references. (*Chem. Abs.* **47**, 713)

Micro method for the determination of vitamin A in the oil seeds, oils, and filter cakes. G. Gorbach and H. Pfudl (Tech. Hochschule, Graz, Austria). *Fette u. Seifen* **54**, 334-7(1952). The method of Kuhn and Brockmann has been adapted to semimicro (1-g. sample) and micro (0.1-g. sample) work. A special micro filter pipet and a capillary absorption tube are described. (*Chem. Abs.* **47**, 888)

The effects of diet and cold on body composition and fat distribution in the white rat. E. Pagé and L. Babineau (Univ. Laval, Quebec). *Can. J. Med. Sci.* **31**, 22-40(1953). Neither the fat content of the ration nor the environmental temperature affect fat distribution. Any difference in efficiency of food utilization between high and low fat diets appears to be the same in the cold as at normal room temperature.

Fat synthesis from small molecules. G. Popjak (Natl. Inst. Med. Research, London). *Biochem. Soc. Symposia* No. **9**, 37-51 (1952). The literature is reviewed and supplemented with some experiments with rabbits. It is concluded that the building stone for fatty acid synthesis in animals is acetate and all of the constituents of the body which yield acetate directly or indirectly can be converted to fatty acids. Glucose not only provides a substantial part of the acetate, but also the glycerol required for fat synthesis. In rabbits the conversion of both glucose and pyruvate to acetate is so great, as shown by the acetylation of p-aminobenzoic acid, that pyruvate probably does not act as a fatty acid precursor otherwise than by previous decarboxylation to acetate. (*Chem. Abs.* **47**, 727)

Effect of the level of dietary calcium on the digestibility of the different fatty acid fractions of coconut oil. M. N. Rao and S. S. De (Indian Inst. Sci., Bangalore). *Indian J. Med. Research* **39**, 457-64(1951). Removal of Ca from the diet of test rats was without effect on the digestibility coefficients determined for coconut oil (m. 22°) and for the unsaturated fatty acid fraction of coconut oil. However, the digestibility coefficient for the saturated fraction (m.p. 52°) was increased from a value of 80.0 to 89.1%. Feces from animals on the Ca-low diets weighed less and contained less soap than from controls. (*Chem. Abs.* **47**, 712)

Simultaneous assay of vitamins A and D. E. V. Rouir. *Bull. soc. chim. biol.* **34**, 234-8(1952). The sample is dissolved in $CHCl_3$ and α-dichlorohydrin containing 1% of acetyl chloride is added to produce colored products. Axerophthol is then estimated from the spectral absorption at 500 $m\mu$ and calciferol from the absorption at 625 $m\mu$. (*Chem. Abs.* **47**, 1211)

Essential fatty acids and their relation to pyridoxine. H. M. Sinclair (Univ. Oxford, Engl.). *Biochem. Soc. Symposia* No. **9**, 80-99(1952). A review with 83 références. (*Chem. Abs.* **47**, 713)

Application of vitamin K as an antiseptic for foods and drinks. I. Y. Tomiyasu, M. Toyomizu, R. Tsukamoto and S. Nonaka (Kyushu Univ., Fukuoka). *Hakko Kogaku Zasshi* (J. Fermentation Technol.) **30**, 1-3(1952). Vitamin K_3 perfectly preserves saké containing 16% ethanol at dilution of 1:40,000. It is also effective in preserving beer at 30° for 20 days at 1:20,000, raw milk at 4° for 1 month at 1:20,000, soy sauce at 1:40,000, salted viscera of sea urchin at 1:10,000, and apple jam at 1:40,000. (*Chem. Abs.* **47**, 778)

Fat combustion and metabolic rate of flying locusts (Schistocerca gregaria). T. Weis-Fogh (Krogh's Lab., Gentoste, Denmark). *Trans. Roy. Soc.* (London) **B237**, 1-36(1952). During a 5-hr. flight of these desert locusts, 80-85% of the total energy expenditure was supplied by fats and fatty acids; the available glycogen probably was used within the first hr. Apparently fat was utilized directly. Lipides formed, on the average, 10% of the weight of the fully developed but sexually immature locusts. (*Chem. Abs.* **47**, 1299)

Sinitiro Kawamura, Abstractor

Concentration of vitamin A by the solvent process. III. Treatment of shark-liver oil with mixed alcohols. Yoshirô Abe, Toyoko Ihara, and Ryûzô Taguchi (Keiô Univ., Tokyo). *J. Chem. Soc. Japan, Ind. Chem. Sect.* **55**, 715-16(1952). Methyl, ethyl, isopropyl, isoamyl, and *n*-butyl alcohols were used separately or in pairs for concentrating vitamin A from shark-liver oil. The best solvent was the mixture of butyl and methyl alcohols (7:3); 50 cc. liver oil gave 3.04 cc. concentrate containing 10,800 i.u. of vitamin A per g. This was as stable as the original liver oil.

Aerobic oxidation of ergosterol in the presence of biacetyl under biochemical conditions. I. The oxygen uptake by ergosterol in the presence of biacetyl. Yoshio Shimazu (Osaka City Univ.). *J. Chem. Soc. Japan, Pure Chem. Sect.* **73**, 683-6(1952). The O_2 uptake by ergosterol in xylene or butanol was followed with the Warburg manometer at 30°. Addition of biacetyl or acetoin (0.5-0.25 *M*) accelerated the O_2 uptake by ergosterol. Riboflavin had effect similar to biacetyl, whereas quinone and rutin inhibited the oxidation of ergosterol. Addition of biacetyl accelerated the oxidation of dehydroergosterol, α-dihydroergosterol, ergosterol-"D", 3(β)-hydroxy-$\Delta^{5,7}$-12-acetoxycholadienoic acid, and $\Delta^{1,3}$-cyclohexadiene, while biacetyl had no effect on the oxidation of cholesterol, bile acid, 3-keto-$\Delta^{4,17}$-12-hydroxycholadienoic acid, linoleic acid, geraniol, olive oil, diphenylpolyene (diene and triene), β-ionone, and anthracene.

II. The oxidation products. *J. Chem. Soc. Japan, Pure Chem. Sect.* **73**, 686-8(1952). As the oxidation products of ergosterol in the presence of biacetyl at 30°, a cryst. substance, melting at 227°, probably $\Delta^{6,22}$-ergostadienetriol-3,5,8, and a yellow noncryst. substance (a further oxidation product than the triol) were obtained.

• Drying Oils

Stuart A. Harrison, Abstractor

Dehydration of castor oil. H. C. Bryson. *Paint Oil Chem. Rev.* **116**, No. 3, 12(1953). The dehydration of castor oil with sulfuric acid catalyst was studied. The effect of time, temperature, and catalyst concentration on rate of dehydration and properties of dehydrated oil were followed. Below 0.6% sulfuric acid catalyst, the dehydrated oil had good color. The drying times of varnishes made from various dehydrated oils were measured.

Segregated pilchard oils. H. W. Chatfield. *Paint Oil Colour J.* **123**, 13(1953). The properties of segregated pilchard oil which make it attractive as a drying oil are discussed. This oil has an iodine value ranging from 200-215 and an acid number of 1-2. It bodies more rapidly than linseed oil. It dries somewhat more slowly than linseed oil; however, when cooked with a resin, the varnish dries more rapidly than a corresponding linseed varnish. The oil yellows more than linseed on stoving at high temperatures.

Developments in the paint industry for 1952. Part II. G. S. Cook. *Paint and Varnish Production* **43**, No. 2, 19(1953). This is the second part of a comprehensive review of the coating industries for 1952. The following fields are covered: chemical intermediates, alkyds, amine resins, phenolic resins, vinyl resins, latex resins, miscellaneous resins, lacquers, plasticizers, and solvents.

Porosity of paint films. S. Eckhaus, I. Wolock, and B. L. Harris. *Ind. Eng. Chem.* **45**, 426(1953). The porosity of pigmented raw and bodied linseed oil films was studied. The porosity was determined by measuring the amount of krypton gas adsorbed by the film at —205° under varying relative pressures. It was found that pigmented films are non-porous below a certain critical pigment volume concentration. Above this point, films contain discrete pores and the porosity increases sharply as the pigment volume ratio is increased.

Dehydrated castor oil. R. L. Terrill. *Paint, Oil and Chem. Rev.* **116**, No. 4, 13(1953). The development of dehydrated castor to its fourth place standing among drying oils used in this country is reviewed. Data are given to show that considerable isomerization of the non-conjugated dienes to conjugated dienes occurs during bodying. Properties and uses in surface coatings are reviewed.

PATENTS

Production of oils having drying properties. E. M. Geiser. *U. S. 2,624,717.* Unsaturated conjunct hydrocarbons from anhydrous hydrogen fluoride polymerization of mono- and diolefines are copolymerized with linseed oil with a boron trifluoride etherate complex for catalyst. Films of the product dry tack-free in two days at room temperature. Other oils may be used.

Surface coating composition and process for preparing the same. J. C. Petropoulos and L. E. Cadwell. *U. S. 2,626,250.* A soybean oil modified alkyd (60 pts.) is dissolved in xylol and heated to reflux. To this is added slowly a mixture of styrene (30 pts.), diallyl fumarate (10 pts.) and Cumene hydroperoxide (2 pts.). After 7½ hours a clear resin solution is obtained. Films air dry clear. Other oil modified alkyds may be used.

Alkyds and varnishes comprising same. H. M. Hoogsteen and N. R. Peterson. *U. S. 2,626,939.* An alkyd is prepared from soybean oil (40 pts.), pentaerythritol (10.1 pts.), phthalic anhydride (29 pts.) by first reacting the oil and P. E. for 1½ hours, at 230°, with 0.1% calcium oxide as catalyst. The mixture is cooled to 180° and the phthalic anhydride plus 2.2-bis-[para-hydroxy propoxyphenyl]-propane (21 pts.) added with about 8% xylene. The mixture is heated to reflux for 6 hours (temp. 190 to 230°). The alkyd obtained dried to touch in 35 minutes. Many variations are given.

Drying oils. *Austrian 173,235.* Mineral oils, preferably paraffin oil fractions boiling from 260-360°, are chlorinated with gaseous chlorine. Excess chlorine is removed. The oils obtained have a diene number of 30 to 70. They are useful as substitutes for wood oil. (*Chem. Abs.* **47**, 885)

Glycerol phthalate alkyds. *Indian 43,544.* Alkyds modified with tobacco-seed oil are described. (*Chem. Abs.* **47**, 886)

Wrinkle finishes. *Indian 43,979.* Phthalic anhydride (35 pts.), glycerol (20 pts.), and fatty acids of tobacco-seed oil (45 pts.) are mixed and heated to 190-200° for 5 hours. At the end the acid value is about 30. After thinning with toluene and addition of drier films are made which wrinkle on baking at 100-150° for 20 to 60 minutes. (*Chem. Abs.* **47**, 886).

• Waxes

R. L. Broadhead, Abstractor

The analysis of the unsaponifiables in fats. H. Anders. *Seifen-Ole-Fette-Wachse* **79**, 28-30(1953). The article deals for the most part with determination of the unsaponifiables in waxes. The wax sample is saponified with alcoholic alkali. The resulting mixture is made just acid to phenolphthalein with acetic acid and treated with calcium or barium chloride at 60°C. with vigorous stirring. The precipitate is washed with water at 100°C., dried, powdered, mixed with sand and Soxhlet extracted with petroleum ether or acetone. The solvent soluble fraction is recovered and refluxed with acetic anhydride to separate hydrocarbons from the alcohols. Tests for identifying the unsaponifiables are discussed.

Self-polishing emulsions for floor maintenance. G. F. von Rosenberg. *Seifen-Ole-Fette-Wachse* **79**, 15-19(1953). Problems arising in connection with the manufacture and use of dry-bright wax floor polishes are discussed. The structure and qualities, as well as the methods of testing such emulsions, are considered. Gersthofen Wax KPS was used as a basis for demonstrating the methods of production.

The components of wool wax. I. The aliphatic alcohols. J. Tiedt and E. V. Truter. *J. Chem. Soc.* **1952**, 4628-30. The straight chain alcohols were isolated as urea adducts from the unsaponifiable portion of wool wax. Upon recovery from the adducts these alcohols were acetylated and again treated with urea. The acetates of the secondary alcohols did not form adducts under these conditions. The urea-primary alcohol acetate adducts then were subjected to a 26-stage fractional crystallization from constant boiling ethanol-benzene. Normal octadecanol, eicosanol, docosanol, tetracosanol and hexacosanol were recovered from the resulting fractions and identified.

PATENTS

Synthetic waxes. Joseph Cunder and Francis J. Licata (to NOPCO Chemical Co.). *U. S. 2,608,493.* A synthetic wax consisting essentially of a mixture of a material normally solid at room temperature has as a principal constituent a substance selected from the group consisting of abietic acid, saturated fatty acids containing more than 9 C atoms and saturated fatty alcohols containing more than 11 C atoms, and a eutectic mixture of solid multivalent soaps. The eutectic mixture makes up 5-90% of the synthetic wax. Hydrogenated sardine oil, melting at 53° (40 parts) was melted, and then 60 parts of a eutectic mixture of Al stearate and Zn stearate were slowly added. This eutectic mixture was composed of 24 parts Al stearate and 36 parts Zn stearate. The mass was heated to 125° and held until a clear fluid was obtained. On cooling, a yellow, opaque, wax-like solid, melting at 107-11° resulted. (*Chem. Abs.* **47**, 896)

Ski wax lubricating composition. Edward C. O'Neil. *U. S. 2,610,150.* A ski wax lubricating composition consists of a wax cake containing 1 lb. melted paraffin or ceresin wax, 0.5 lb. metal powder, and 136 grains of powdered tartaric acid crystals to serve as a dispersing agent and hardener. The mixture is cooled. Cu, Sn, Zn and bronze powders also may be used. (*Chem. Abs.* **47**, 897)

Sisal wax and method of producing the same. P. F. Bruins (to Christian Missions Foundation). *British 675,001.* Sisal wax is extracted from the surface of the uncrushed sisal leaf by a solvent for the wax, while the leaf preserves its original fibre structure and retains its aqueous pulp in uncrushed form. The solvent used is preferably anhydrous and immiscible with H_2O, e.g., $CHCl_3$, C_2Cl_4, CCl_4. These in vapor form are brought into contact with the leaf and there condensed to liquid form, the extraction being carried out at 50°. Sisal fibre is separated, after the surface solvent-extraction, by decorticating the hot, limp leaf with crushing of the pulp. The refined wax has a crystalline structure. [*Brit Abs.* **BII**, Nov., 1169(1952)]

• Detergents

Lenore Petchaft, Abstractor

Fatty alcohols from tallow. Anon. *Chem. Week* **72**, No. 8, 57-8 (1953); *Chem. Eng.* **60**, No. 3, 118(1953). A sodium reduction process will convert tallow to a mixture of approximately 68% stearyl and oleyl, 29% cetyl and 3% myristyl alcohols, readily converted to the sulfates. Among tallow-sulfate advantages claimed are better detergency (whiter clothing at lower concentrations), greater emolliency to the skin, a cheaper and easily available raw material and easy blending with additives. The sulfates are useful in both light and heavy-duty detergent formulations, bar detergents and various non-soap applications.

Alkylarylsulfonates as conditioners in wet-twisting cotton tire cord. J. C. Ambelang, J. A. Shotton, G. W. Gottschalk, H. P. Stevens, and G. E. P. Smith, Jr. (Firestone Tire and Rubber Co., Akron, Ohio). *Ind. Eng. Chem.* **45**, 204-10(1953). Wet twisting with sodium sulfonates or alkylnaphthalenes containing 14 or more alkyl carbon atoms was found to increase the breaking strength of tire cord by a significant amount over the strength obtained by use of sulfonated alkylnaphthalenes containing 12 or fewer alkyl carbon atoms. Parallel effects were observed in the alkylbenzene and alkylphenol series. The sulfonates giving improved cord strength tended to be oil-soluble and to be derived from hydrocarbons of high aniline point. There was no correlation between cord strength and wetting speed of the sulfonate. By use of sodium alkylarylsulfonates of the proper degree of alkylation in wet-twisting cotton tire cord, it is possible to obtain increased breaking strength without loss in elongation.

Measuring effectiveness of metal cleaners with radioactive tracers. J. W. Hensley (Wyandotte Chemicals Corp., Wyandotte, Mich.). *Iron Age* **170**, No. 20, 151-4(1952). A fatty acid type soil was tagged with radioactive tracers and applied to prepared metal disks 1.5 in. in diameter. Radioactivity was measured with a Geiger counter before and after cleaning. More than 2500 tests have been made with individual cleaner components and compounded cleaners. Effects of concentration, cleaning time, c.d., and direction have been determined as well as effect of surface finish and surface treatment. Rate of soil removal with a compounded cleaner was 5 times as great as when Na metasilicate alone was used. The tests supply research data. (*Chem. Abs.* **47**, 892)

Whiteness measurement of test-washed fabrics. H. Machemer (Sunlicht-Ges. A.G., Mannheim, Ger.). *Fette u. Seifen* **54**, 324-33(1952). Whiteness measurements with various commercial instruments against MgO standards do not yield absolute results because of differences in measurement, photoelectric cell sensitivity, and MgO. There is a relation between measurements of reflected and transmitted light, but transmitted light measurements appear to be valuable only as a supplement to practical detergency evaluation. (*Chem. Abs.* **47**, 1410)

Reflectance as a measure of the soil content of cotton fabric. Irving Reich, Foster Dee Snell, and Lloyd Osipow (Foster D. Snell, Inc., New York, N. Y.). *Ind. Eng. Chem.* **45**, 137-41 (1953). Reflectance measurements on artificially soiled fabrics are almost universally employed for the evaluation of cotton detergency. However, the change in reflectance during soiling and washing is not a linear function of soil removal. The reflectance of soiled cloth can be correlated with the amount of soil present by an equation of the form

$$\log \frac{(1-R)^2}{2R} - \frac{(1-R')^2}{2R'} = n \log G + \text{constant}$$

where R is the reflectance of the soiled cloth, R′ is the reflectance of the clean cloth and G is the amount of soil present. During washing, the value of n is frequently 1 and the equation becomes the Kubelka-Munk equation. During artificial soiling n often has a value of 0.65 to 0.7. The results indicate that in the deposition of soil from a solvent, accretion may occur largely by growth of flocs rather than by uniform distribution of fresh soil particles. Removal of soil by detergent solution appears to be mainly by removal of entire flocs rather than by a reversal of the process by which the flocs were originally formed.

A microscopic study of molecular complex formation and soil removal. D. G. Stevenson. *J. Textile Institute* **44**, No. 1, T12-35(1953). The formation of complexes between fatty acids, long-chain alcohols, etc. and detergents would appear to be of considerable importance in soil removal processes. Such complex formation may be divided into two classes, complex formation in the bulk phase, resulting in the separation of a third, complex phase, and secondly, complex formation at an oil-water interface. Complex formation in the bulk phase gives rise to gelatinous systems and may be regarded as one mechanism in the removal of soiling matter from fibers, the action being related to solubilization. Interaction between long-chain compounds dissolved in an oil phase and a detergent in an aqueous phase generally gives rise to spontaneous emulsification. Interfacial complexes may be formed by interaction between oil-soluble and water-soluble molecules adsorbed at an interface; in this case an extra low interfacial tension will result. Salts present within fibers appear to be of considerable importance, their function being to inflate gelatinous layers of complex by osmosis, thereby loosening and dispersing the soiling matter. Soiling matter appeared to be removed from fibers in non-ionic detergent more by complex formation and solubilization than by the usual "rolling up" process and emulsification. Undesirable properties of molecular complexes are their gelatinous nature, which tends to hinder the free dispersion of the soiling matter, and also the absorption of detergent incurred in their formation.

Continuous processes in the production of synthetic detergents. H. Stupel (Seifenfabrick Hochdorf, Switz.). *Fette u. Seifen* **54**, 455-62(1952). A review with 59 references. (*Chem. Abs.* **47**, 894)

The progress of (cellulosic) fiber degradation on washing. H. Vollenbruck. *Melliand Textilber* **33**, 856-9(1952). Graphs illustrating the progress of degradation during washing were prepared from data obtained by laboratory bleaching tests carried out under different bleaching conditions. Between a degree of polymerization (DP) of 2,000 and 500 the points may be plotted on a common curve. It is possible, with the aid of this curve, to compare the degradation of fibers when washing fabrics of different DP values. The slopes of the curves of new fabric, the same fabric after 25 launderings, and after 50 launderings may be different, tending either to become more steep or more shallow. That the latter development is not due to changes in the fabric caused by washing is shown by after-bleaching tests.

Sinitiro Kawamura, Abstractor

The influence of ultrasonic radiation on the reaction between aqueous sodium oleate solution and gaseous oxygen. I. Fumio Hirata, Eiji Ambo, and Hiroshi Kawakami (Gumma Univ.). *J. Chem. Soc. Japan, Pure Chem. Sect.* **73**, 429-31(1952). From the determinations of iodine value and refractive index it was concluded that long-time radiation by ultrasonic waves of aq. 10% Na oleate solution with influx of gaseous oxygen gave complicated changes with appearance and disappearance of turbidity, especially in the earlier period of reaction.

The influence of ultrasonic radiation on the reaction between aqueous sodium oleate solution and gaseous oxygen. II. Fumio Hirata, Eiji Ambo, and Hiroshi Kawakami (Gumma Univ.). *J. Chem. Soc. Japan, Pure Chem. Sect.* **73**, 431-2(1952). X-ray diffraction analyses were applied.

The influence of ultrasonic radiation on the reaction between aqueous sodium oleate solution and gaseous oxygen. III. Fumio Hirata, Eiji Ambo, and Riroshi Kawakami (Gumma Univ.). *J. Chem. Soc. Japan, Pure Chem.. Sect.* **73**, 533-6(1952). The process of oxidation of Na oleate under ultrasonic radiation was discussed in light of the above findings.

The nature of emulsions. Structural viscosity of dispersion medium in relation to the stability. Toshizô Isemura and Yûzô Kimura (Osaka Univ.). *J. Chem. Soc. Japan, Pure Chem. Sect.* **73**, 405-9(1952). In the water-benzene emulsion with Na oleate as the emulsifier, certain amounts of butyl, octyl, lauryl, or cetyl alcohol were added to vary the structural viscosity of the dispersion medium, and the stabilities of the systems were compared. In the presence of monomolecular layer of the emulsifier at the interface water/oil, the particles of emulsion were prevented from coalescence, and in such a case the use of dispersion medium of higher structural viscosity was effective in the formation and stabilization of emulsion.

The invert soap (cationic detergent) as the fungicide. I. Yusuke Sumiki, Kanji Yamamoto, and Kyôji Takeda (Univ. Tokyo.) *J. Agr. Chem. Soc. Japan* **26**, 325-8(1952). The quaternary ammonium compounds synthesized, m.p., and the dilution showing the same fungicide activity against the spores of *Gibberella fujikuroi* as that of 0.1% uspulum (or $1:3\times10^4$ dilution of methoxyethyl mercuric chloride) were, respectively, dimethyloctylbenzylammonium chloride, 74°, 10°; dimethyldodecylbenzylammonium chloride, 45°, 8×10^4; dimethylhexadecylbenzylammonium chloride, 55-6°, 1.6×10^5; dimethyloctadecylbenzylammonium chloride, 150-8°, 1.2×10^5; dimethyldodecylmethylthioethylammonium chloride, 59°, 10^4; *N*, *N'*-bisdimethyl-*N*,*N'*-bisdodecyl-(*N*-ethylthio-*N'*-ethyl)-diammonium chloride, 209°, 8×10^4; dimethyldodecylphenylthioethylammonium chloride, 82.5°, 2.2×10^5; and nicotine-*N*,*N'*bisdodecyl chloride, 99°, 4×10^3.

PATENTS

Noncaking detergent compositions. Hans George Kirschenbauer (Colgate-Palmolive-Peet Co.). *U. S. 2,625,513-14.* A substantially non-caking, free-flowing non-abrasive detergent composition is prepared in particulate form by mixing an organic detergent in granular form with a synthetic hydrated magnesium silicate material in powdered form, the $MgO:SiO_2$ ratio having a maximum of about 1:2.

Methods of making oxyalkylene condensation products. Robert A. Wilson (Monsanto Chemical Co.). *Brit. 683,884.* Surface-active agents are prepared by continuously introducing an alkylene oxide which boils below 200°C. into a reaction zone at such a rate that the pressure in the zone is maintained substantially constant and the alkylene oxide is present in the gaseous state; spraying into the zone, in a finely divided liquid form, a water-insoluble organic compound containing an hydroxyl, carboxyl, amino or mercapto group to react with the alkylene oxide; cooling to maintain a temperature at which substantial decomposition of the reaction products is avoided.

Improvements relating to soap compositions. Lever Brothers and Unilever Ltd. *Brit. 685,049.* An improved powdered soap composition is made by preparing a soap powder from a mixture of molten soap and sodium carbonate, and thereafter mixing with the soap powder not more than 15% by weight of finely-divided calcium carbonate to aid in precipitating the calcium ions rapidly from wash water in order to save soap.

Continuous purification of soap. Union Francaise Commerciale et Industrielle. *Brit. 685,295.* Neat soap is continuously washed in a number of stages with brine having a concentration slightly above the critical concentration and the washed soap is continuously mixed with water so that part of it is converted into nigre, the unconverted neat soap constituting the desired purified soap and the nigre being continuously treated with brine for the production of a mixture of neat soap and of brine having a concentration suitable for its use in the washing step.

Improved detergent briquettes. George Franklyn Hicks. *Brit. 687,075.* A detergent briquette which, when dissolved will form a stream of detergent solution of substantially uniform concentration, is prepared by having a longitudinal channel extending throughout the briquette so that the dissolving liquid may flow in contact with the inner surface of the channel and also with the outer surface of the briquette.