ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

THE ANTIOXIDATIVE EFFECT OF CERTAIN AROMATIC HYDROXY COMPOUNDS IN BUTTER WITH SPECIAL REFERENCE TO ETHYL GALLATE. P. Swartling. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 375-81(1949). Ethyl and propyl gallates, propenylmethylguaethol, p-methoxyphenol, ethyl hydrocaffeate, nordihydroguaiaretic acid (N.D.G.A.), conidendrin, α-tocopherol, and α-tocopherol acetate were added to butter and their effect on the oxidation was determined by the rate of change of the peroxide value when stored at room temperature. The greatest antioxygenic activity was shown by the esters of gallic acid, ethyl hydrocaffeate, and N.D.G.A. p-Methoxyphenol and conidendrin had a slight effect but not sufficient to warrant their use. Propenylmethylguaethol had a slight proöxidative effect. α-Tocopherol and α-tocopherol acetate showed a proöxidative effect and also a tendency to promote formation of a fishy flavor. The addition of more than 2.5 g./100 kg. of these compounds gave rise to distinct flavors. (*Chem. Abs. 44,* 2664.)

ANTIOXIDANTS IN RAISING THE STABILITY OF DRY MILK PRODUCTS. S. Shtal'berg (All-Union Inst. Milk Ind., Moscow). *Molochnaya Prom. 10,* No. 8, 7-8(1949). Addition of small amounts of vitamin E, vitamin C, vitamin D, glycine, and Na pyrophosphate stabilize dried cream significantly in 10 months' storage experiments in respect to taste preservation. (*Chem. Abs. 44,* 3167.)

THE ANTIOXIDANT PROPERTIES OF VITAMIN E (α-TOCOPHEROL), SYNTHETIC α-TOCOPHEROL, AND DI-α-TOCOPHEROL ACETATE IN BUTTERFAT. A. Reinart. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 405-15(1949). Vitamin E in butterfat is 2 to 2.5 times higher in the late summer and autumn than in winter and spring. The faults in butter from oxidation are highest in summer butter and lowest in winter. Correlation of the score of the butter and vitamin E concentration indicates that in the concentration found in butterfat vitamin E is not effective as an antioxidant. Bubbling air through butterfat indicates that vitamin E has no antioxidant value. Under the same conditions synthetic α-tocopherol and di-α-tocopherol acetate showed only limited antioxidant activity. Cream containing β-carotene and biacetyl but not aerated was protected against oxidation by di-α-tocopherol for the duration of the tests. (*Chem. Abs. 44,* 2664.)

OCCURRENCE AND PREVENTION OF OXIDATIVE DETERIORATION OF DAIRY PRODUCTS. F. D. Tollenaar. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 357-67(1949). The mechanisms of chemical, enzymic, and microbial fat spoilage are outlined. Dry butterfat, dried whole milk, and cold-storage butter may be protected by antioxidants. The ethyl, octyl, and lauryl gallates were added in a concentration of 0.01% to dry fat and their antioxygenic activity was found to be inversely proportional to their molecular weight. The higher gallates may be more efficient in dried whole milk. The hexyl, octyl, nonyl, decyl, and lauryl esters show stronger fungistatic activity than the lower esters and thereby retard the development of ketonic rancidity. The astringent bitter taste of the esters increases with the molecular weight. (*Chem. Abs. 44,* 2664.)

POLYUNSATURATED FAT ACIDS IN BUTTER AND THEIR INFLUENCE ON THE OXIDATION OF BUTTER. S. Mattsson. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 308-24(1949). The content of linoleic, linolenic, and conjugated C_{18} acid in butter varies with the season and is greatest when on pasture. The addition of linseed oil to the ration increases the conjugated acids from 0.5 to 6.7% with little or no increase in the unconjugated acids. (*Chem. Abs. 44,* 2663.)

THE COMPOSITION OF BUTTERFAT AS THE PRIME CAUSE OF OXIDATION FAULTS IN BUTTER. A. Reinart. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 392-404(1949). Bubbling air through cream at 60-70° does not always result in the same type of oxidation. The concentration of unsaturated fat acids in the butterfat varies considerably. Oxidation is greatest in those samples having the highest unsaturation. The natural antioxidants in the butterfat do not appear to influence the stability of the butterfat against oxidation. The oxidation seems to be related to the concentration of highly unsaturated acids in the C_{20}-C_{22} series. (*Chem. Abs. 44,* 2665.)

OXIDATION IN THE FAT PHASE OF DAIRY PRODUCTS. G. L. Hills. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 302-5(1949). Solutions of pure NaCl accelerate oxidation in the presence of acid due to the ability of fat hydroperoxide to liberate chlorine from acid NaCl solution and the chlorine to accelerate oxidation. This action is responsible for the deterioration of salted butter in storage. Oxidations are initiated in the fat phase as well as in the liquid. (*Chem. Abs. 44,* 2633.)

MICROBIAL OXIDATION OF BUTTERFAT. T. Storgards and M. Hietaranta. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 280-3(1949). In special salted (soured, neutralized, pH above 6) butter the peroxide value increased and then dropped to 0. The decrease in the peroxide value is the result of the action of a catalase-producing bacterium. The bacteria isolated above a pH of 6 when transplanted to butter caused an intense peroxide formation in the first part of the storage before lipolytic decomposition and catalase formation was active. (*Chem. Abs. 44,* 2663.)

BIACETYL AS A PROÖXIDANT IN BUTTER AND MARGARINE. A. Reinart. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 382-8 (1949). Bubbling air through cream containing biacetyl and held at 55° showed a greater increase in peroxide value than cream without biacetyl. The addition of 0.1-0.2% biacetyl to butter and margarine promotes oxidation of the fat. (*Chem. Abs. 44,* 2664.)

THE RELATION OF PEROXIDE VALUES TO TALLOWY FLAVORS IN VARIOUS FATS. G. E. Holm. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 336-40(1949). Fats of different degrees of unsaturation have different oxygen-absorption requirements to render them inedible. The minimum requirements for butter oil, lard, and cottonseed oil have been determined. The relation of peroxide formation at different temperatures is indicated and discussed with respect to the use of the peroxide values as a criterion of the rate of oxidation and spoilage in butter oil, butter, and dried milk. (*Chem. Abs. 44,* 2663.)

THE FORMATION OF OILY AND FISHY FLAVORS IN BUTTER. T. Storgards and M. Hietaranta. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 389-91(1949). The oily and fishy flavors originate in the decomposition products that result from the autoxidation of butterfat. In the oxidation of butterfat free from lecithin, especially in ultraviolet light. there was a fishy flavor. The development of the flavor was more pronounced when oleic acid was added and of still greater intensity when linoleic was added. The addition of lecithin or trimethylamine had an inhibitory effect if added before oxidation. Linoleic acid is considered to be the main cause of the oily or fishy flavor. (*Chem. Abs. 44,* 2664.)

SPECTROPHOTOMETRIC INVESTIGATION OF OXIDIZED BUTTERFAT. U. Holm and G. Wode. *Proc. 12th Intern. Dairy Congr. (Stockholm) 2,* 325-35(1949). The oxidation processes in fats and oils are traced by absorption of the oxidation products on Al_2O_3 followed by suitable development with petroleum ether, elution with absolute EtOH, and measurement in a spectrophotometer. Winter butter shows a linear relation of absorption at 2300 Å and peroxide value. Summer butter oxidizes at first without any significant change in absorption but continued oxidation shows a linear relation between special absorption at 2300 Å and the peroxide value. Butterfat from cows on a ration containing linseed oil shows no such relation. (*Chem. Abs. 44,* 2663.)

SIGNIFICANCE OF THE VARIATIONS FOUND IN THE ULTRAVIOLET SPECTRUM OF UNSATURATED ESTERS DURING THEIR AUTOXIDATION. A. Chevallier and C. Burg (Univ. Strasbourg, France). *Bull. soc. chim. France 1949,* 707-10. Ethyl oleate and triolein were prepared free from contamination with polyethylenic esters by the chromatographic method. The absence of the latter was checked by ultraviolet absorption. No appearance of ultraviolet absorption was observed on autoxidation of ethyl oleate and triolein. It is supposed that these absorptions are brought about during the autoxidation of the polyethylenic acids and esters by the conjugation of the double bonds accompanying the formation of hydroperoxides. (*Chem. Abs. 44,* 2370.)

KEEPING QUALITY OF GHEE HEATED TO DIFFERENT TEMPERATURES. T. M. Paul and C. P. Anantakrishnan (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Dairy Sci. 2* (3), 108-113 (1949). The keeping quality of ghee melted at temperatures varying from 60 to 150° was studied. Mold growth occurred in the presence of moisture and samples rapidly developed free fatty acids and showed high peroxide values, especially when stored in tinned cans. To obtain ghee of good keeping quality, butter should be melted at 120° and the final product should not contain more than 0.5% moisture. (*Biol. Abs.,* Sect. C, *24,* 440.)

GRAIN FORMATION IN GHEE. T. M. Paul and K. S. Suri (Indian Dairy Res. Inst., Bangalore). *Indian Jour. Dairy Sci. 2*

(3), 94-98(1949). For the best grain formation it was necessary to incubate the sample 1° above melting point. Cow's ghee gave best grains when held at 29° and buffalo's ghee at 31°. (*Biol. Abs.* Sect. C, *24,* 440.)

PLASTIC CREAM AND BUTTEROIL. C. W. Decker (Washington State Coll., Pullman). *Amer. Butter and Cheese Rev. 11* (7), 28-31(1949). A complete description is given for the manufacture of plastic cream and butteroil. Problems in processing, laboratory control, and keeping qualities are considered. [*Biol. Abs.,* Sect. G, *24* (1), 31.]

TECHNICAL ASPECTS ON THE CANNING OF BUTTER. G. W. Coombs. *Australian Jour. Dairy Technol. 4* (2), 43-45(1949). This paper deals with work done to make a butter concentrate for hot climates a commercial possibility. The moisture content of the finished product must be within 0.2-0.3%. The salt used must be free of $MgCl_2$. To overcome the oxidizing effect of oxygen the concentration process was carried out in vacuo, and the cans used for packing had to be specially sealed to avoid the leakage of atmospheric oxygen on storage. Deodorized and hydrogenated peanut oil was added (2%) to produce firmness of body and to raise the melting point of the concentrate. The caloric value is 250 calories per ounce and the vitamin A content is almost unimpaired. For table use it is mixed with 16% of water, milk or ripened milk, while for cooking four-fifths of the quantity of butter is used. (*Biol. Abst.,* Sect. G, *24* [1], 31.)

TREATMENT OF BUTTER IN MANUFACTURE AND ITS STABILITY. A. Zheltakov. *Molochnaya Prom. 10,* No. 6, 31-3(1949). Butter with well-dispersed water (particles of micron size) gives 10-20 times lower microflora levels after 30-60 days' storage than butter with poorly dispersed water. The taste quality follows the same pattern. The test of proper emulsification may be based on the rate of evaporation of water under standard conditions. (*Chem. Abs. 44,* 3167.)

CHEMICAL EXAMINATION OF THE SEEDS OF *Cucumis sativus.* P. Soni, S. C. Gupta, and J. S. Aggarwal (Council of Sci. & Ind. Research, Delhi, India). *J. Sci. & Ind. Research (India) 8B,* No. 11, 210-13(1949). The seed kernels, forming 75% of the seed, are extracted with petroleum ether, yielding 42.5% of an oil. It is composed of the following fatty acids: 0.63 acids lower than palmitic acid, 4.12 palmitic acid, 16.30 stearic acid, 39.62 linoleic acid, and 38.42% oleic acid. (*Chem. Abs. 44,* 3271.)

WALNUT OIL FROM THE IQUAPE (SAO PAULO) WALNUT. A. S. Neto. *Anais assoc. quim. Brasil 6,* 99-104(1947). The crude oil gave d_{20} 0.923, acid no. 6.9, saponification no. 192, iodine no. (Wijs) 162; n_{20} 1.4781, unsaponifiable 0.4%, drying within 72 hours. The boiled oil gave d_{20} 0.931, absolute η_{20} (centipoise) 75, drying in about 9 hours. The crude and boiled oils were used in paints which were exposed to the conditions of the Weather-Ometer. Poor results were obtained as indicated by spot formation and disintegration of the film. Varnish films containing 44% of the oil on metal plates dried completely in 8 hours, showing no stickiness to touch; their resistance to water was equal to that of linseed oil films. (*Chem. Abs. 44,* 2262.)

SQUALENE IN RICE OIL. A. Kato. *J. Nippon Oil Technol. Soc. 2* (4), 34-9(1949). Crude rice oil contained 2.2% unsaponifiable oil; clear, red, viscous, n^{15}_{D} 1.5200, acetyl no. 139, and iodine no. 225.9. Thirty g. unsaponifiable oil in 5 volumes ether treated with dry HCl under cooling gave 2.5 g. white crystals, m. 123-125.2°; this agrees in m.p. with hexahydrochlorosqualene obtained from shark-liver oil. Recrystallization of white crystals from acetone gives a product m. 143-5°, which corresponds in m.p. to the hexahydrochloride of the squalene isomer from teaseed oil, and further recrystalization from petroleum ether gives insoluble crystals, m. 144-9° and containing 32.13% Cl. (*Chem. Abs. 44,* 1269.)

CHANGE OF OIL DURING THE STORAGE OF RICE POLISHINGS. Tsichiya and S. Kinomura. *J. Nippon Oil Technol. Soc. 2* (4), 30-3(1949). During the storage of rice polishings for 17 months, the content of oil decreased to 3-5% and the acid no. increased to a maximum, then showed a gradual decrease till the end; saponification no. decreased to 93. The oil (3.69%) extracted from the polishings showed acid no. 88.14, iodine no. 117.8, and saponification no. 110.6; it is dissolved in ether, saponified with alkali and removal of soap gives a neutral oil which showed unsaponifiable substance 50.01% and iodine no. 109.8. Fat acid obtained from the neutral oil showed iodine no. 115.2 and neutralization no. 163.7. (*Chem. Abs. 44,* 1269.)

THE OIL FROM RYE ERGOT. II. BEHAVIOR OF THE OIL IN VACUUM DISTILLATION. J. D. Rodriguez and I. R. Marques. *Anales de fis. y quim. (Madrid) 45B,* 89-110(1949). Two ergot oils of similar ricinoleic acid content but different OH index were vacuum distilled to explain the absence of enanthole and undecylenic acid in the distillation products. These were found in a comparative study of the distillations of castor oil and acetylated castor oil. The conclusion was reached that the acid esterifying the OH group in the ricinoleic acid contained in ergot oil is removed during the pyrolytic process with formation of a double bond; this hinders the mechanism which would lead to the pyrolytic formation of enanthole and undecylenic acid. (*Chem. Abs. 44,* 3273.)

SESAME, NEW CASH CROP. J. A. Martin. *Crops & Soils 2* (7), 7(1950). Sesame shows promise of becoming a profitable cash crop in the South. It is believed that a suitable variety can be released in 2 or 3 years.

CONFIGURATION OF NATURALLY OCCURRING MIXED GLYCERIDES. V. THE CONFIGURATION OF THE MAJOR COMPONENT GLYCERIDES OF CACAO BUTTER. M. L. Meara (Univ., Liverpool, England). *J. Chem. Soc. 1949,* 2154-7; cacao butter was resolved into 11 fractions by exhaustive crystallization and the component fatty acids of each fraction were determined by ester fractionation after a preliminary lead salt separation. The following composition is given: fully saturated glycerides 2.6, oleodipalmitin 3.7, oleopalmitostearin 57, oleodistearin 22.2, palmitodiolein 7.4, stearodiolein 5.8, and triolein 1.1%. (*Chem. Abs. 44,* 1413.)

PRISTANE. I. THE UNSAPONIFIABLE MATTER OF THE LIVER OIL OF THE BASKING SHARK. N. A. Sorensen and J. Mehlum. *Acta Chem. Scand. 2,* 140-6(1948). The unsaponifiable matter of basking shark-liver oil had the following approximate composition: cholesterol 0.4, pristane 14, squalene 84, cetyl alcohol 0.6, stearyl alcohol 0.4, oleyl alcohol 0.3%. (*Chem. Abs. 44,* 1397.)

EXTRACTION OF PENTOSE FROM COTTONSEED HULLS. Tai-Nien. *J. Chem. Eng. China 15,* 69-71(1948). Delintered cottonseed hulls, freed from constituents soluble in hot water (mainly catechol tannin) (100 g.) are refluxed with 800 cc. dilute sulfuric acid in an oil bath kept at 120-30°. Under optimum conditions (i.e. with 3-6% sulfuric acid and extraction time four hours) 88.8% of the original pentose could be extracted; this is equivalent to a yield of 41.5% from the delintered cottonseed hulls. (*Chem. Abs. 44,* 1422.)

THE PROBLEM OF THE PRESERVATION OF OLIVE-CAKE. O. Verona and M. Valleggi. *Olearia 3,* 639-46(1949). Microbiological and chemical experiments with original olive-cake and olive-cake treated with anti-ferments (HCl, $Na_2S_2O_5$, or NaF) are described. Some of the anti-ferments evidently act as checks on microbic activity; further experiments are required to solve the question. (*Chem. Abs. 44,* 1269.)

CONTRIBUTION TO THE STUDY OF THE DEPENDENCE OF VEGETABLE OILS ON THE CLIMATE AND SOIL. I. JAPANESE CAMELLIA OIL. R. Dios Vidal and Vieitez Cortizo. *Anales de fis. y quim. (Madrid) 45* (B) 1469-1488(1949). A physiological, pedological, and climatic study of Galician zones where the Japanese Camellia is grown, is given. The pH, organic matter, humidity, and the mechanical analysis was determined. The oil was extracted and the organoleptic portion, proteins, etc., as well as the different physical and chemical constants of the oil were determined. The total of the fatty acids, solid and liquid, were examined quantitatively and their characteristic constants were established.

THE CULTIVATION OF OLEAGINOUS PLANTS IN THE U.S.S.R. G. Haussmann. *Olearia 3,* 24-31(1949). The author reviews the principal oil plants and trees cultivated in the U.S.S.R., examining the data for production and the characteristic feature of their cultivation. The output of vegetable oils in 1948 is expected to amount to 675,000 metric tons, a figure slightly below the pre-war average. Though the supply is not yet sufficient to cover domestic demand, it is thought that when the present five-year plan is completed, there is likely to be an exportable surplus of vegetable oils that may have a permanent effect on the world market situation.

THE CULTIVATION OF OLEIFEROUS PLANTS IN EMILIA. A. Crocioni. *Olearia 3,* 32-36(1949). The status of the olive plantations in the provinces of Romagna and the development of herbaceous oil crops in Emilia is examined. In provinces which are large producers of animal fats, these crops are not of great importance because they have to meet the competition of other more profitable industrial plants. The two oil-seed plants whose cultivation should be encouraged in that part of Italy are the flax and sunflower. The prosperous wine industry of Emilia affords a firm foundation for the extraction of oil from grapeseeds.

EXTRACTION OF SOYBEANS BY ALCOHOLYSIS. K. Iguchi (South Manchurian Railway Central Lab., Dairen, Manchuria). *Rept. Japan Assoc. Advancement Sci. 16,* 391-6(1942). Powdered soybeans in two parts of alkaline (0.05 N) 95% or higher EtOH at room temperature gave within a few hours EtOH-soluble ethyl esters of the oil acids; glycerol, protein, and other precipitates were easily separable in relatively pure form. Methanolysis required at least 97% MeOH at 35° and gave less glycerol. (*Chem. Abs. 44,* 3271.)

NEW OIL EXTRACTION PROCESS USED BY COTTONSEED PROCESSING FIRM IN ARKANSAS. N. H. Moore (Delta Products Co.) *Am. Miller and Processor 78* (4), 58(1950). The use of expellers to prepare cottonseed for solvent extraction is described. This process reduces the residual oil to 0.3% and produces an oil of good quality.

EXTRACTION WITH SOLVENTS OF THE NON-SAPONIFIABLE FROM FISH LIVER OILS. L. Gutierrez Jodra. *Anales de fís. y quim. (Madrid) 45* (B), 1453-1468(1949). With the object of applying the calculations based on solvent extraction to the direct extraction of the non-saponifiable components of fish-liver oils, the systems formed by non-saponifiable components of cod-liver oil, hake-liver oil, the corresponding neutral oils and methanol, are described. In the case of cod-liver oil, ethanol was also used as a solvent. The solubility data obtained are graphically represented by ternary diagrams and the distribution and selectivity diagrams are also given. The equations proposed by several investigators for the correlation of the equilibrium data were applied.

WASTE GASES OF VEGETABLE-OIL OXIDATION PROCESSES AND THEIR DISPOSAL. G. M. Ginodman. *Gigiena i Sanit. 1949,* No. 3, 22-4. The gases contain acrolein and unknown organic acids; they can be burned in open furnaces at 800-900° with complete loss of odor. Catalytic oxidation at 200-300° is more satisfactory. (*Chem. Abs. 44,* 3272.)

POWER REQUIREMENT AND THE EFFECTIVENESS OF STIRRING. K. Magnusson. *Iva 20,* 90-9(1949). The effectiveness of stirring devices of different shape and dimensions in castor oil, linseed oil, and water is reviewed. (*Chem. Abs. 44,* 2802.)

PREPARATION OF IODINE DERIVATIVES FROM NUT OIL. A. M. Toribio. *Anales real acad. farm. 14,* 445-50(1948). Iodine compounds are of interest as contrast media for x-ray absorption. It was found impossible to prepare iodine derivatives from almond and linseed oils or their ethyl esters. Nut oil or the ethyl ester derived from it by alcoholysis gives good results with a current of gaseous HI, although iodination is not complete. (*Chem. Abs. 44,* 3273.)

MODIFIED METHOD FOR THE DETERMINATION OF THE TITER OF COMMERCIAL OILS AND OLEINS. J. M. Brignoni. *Quimica ind. (Uruguay) 1,* 21-4(1946). The classic method for determination of titer of materials of titer below 20° is time-consuming and of poor reproducibility. In the proposed method the ice bath is rotated mechanically at 30 revolutions per minute around the stationary titer tube, with the thermometer located off center in the tube. Reproducibility within 0.1° and economy of operator's time are claimed. (*Chem. Abs. 44,* 3273.)

SEMIMICRO METHOD FOR DETERMINATION OF IODINE NUMBER IN RAW MATERIALS AND COMMERCIAL STEARIC ACID. J. M. Brignoni. *Quimica ind. (Uruguay) 1,* 13-19(1946). The proposed method uses a sample of six drops of welted material (av. 0.0809 g.), 1 ml. $CHCl_3$, 2.5 ml. iodine solution, and 15-minute agitation, in a modified Hanus method. Economy of reagents with no sacrifice in accuracy is claimed. (*Chem. Abs. 44,* 3269.)

TETRAHYDROFURAN AS FAT AND LIPID SOLVENT. H. Cremer and H. Schuhler (Joh.-Gutenberg Univ. Mainz, Ger.). *Biochem. Z. 320,* 112-14(1949). Data are reported on the solubility of various fatty acids, glycerides, cholesterol, etc. in tetrahydrofuran, even when it contains 8% water. It dissolves easily phosphatides, especially cephalin (12.8% at room temp.), and cholesterol. It is as good a means for extracting from blood or serum chloroform-soluble substances as chloroform itself, and is preferable to the alcohol-ether mixture. Its lethal dose for rabbits is 2.8 g./kg. but care must be exercised in its use, especially to avoid getting the substance on the skin. (*Chem. Abs. 44,* 3068.)

THE USE OF DETERGENTS FOR QUANTITATIVE FAT DETERMINATIONS. I. DETERMINATION OF FAT IN MILK. P. Schain. (Vet. Admin. Hosp., Staten Island, N. Y.). *Science 110,* 121-122 (1949). A simple method for the determination of fat in milk is given. Results obtained with 100 duplicate samples using this method and the standard Babcock method are in complete agreement. (*Biol. Abs.* Sect. G, *24* [1], 31).

DETERMINATION OF FAT IN CASEIN. I. Bolgar (Dnepropetrovsk Farm Product Inst.). *Molochnaya Prom. 10,* No. 10, 27-8(1949). Casein should be first allowed to swell and disperse in H_2SO_4 before shaking and heating in the butyrometer, otherwise extensive carbonization gives erroneous results. The initial swelling takes place readily on standing overnight without agitation. (*Chem. Abs. 44,* 3168.)

DETERMINATION OF MOISTURE IN OIL SEEDS WITH INFRARED RAYS. M. Fauve. *Bull. mens. ITERG. 3,* 323-9(1949). The drying of colza seed by infrared rays gives the moisture in about 10 minutes with an error not exceeding 0.6% (usually less) as compared with the oven method. Average values for several hundred analyses are tabulated. The method applies equally to the determination of moisture and volatile matter (solvents) in oils. These latter are exposed to the lamp for 15 minutes in a dish of 83 mm. diameter. (*Chem. Abs. 44,* 1723.)

THERMOCHEMISTRY OF VEGETABLE OILS. II. SPECIFIC HEAT AND DENSITY OF INDUSTRIAL SOLUTIONS OF OLIVE OIL. J. Oliver Ruiz, J. de la Maza, and I. Borrero. *Anales de fís. y quim. (Madrid) 45 (B),* 1491-1500(1949). Experimental determinations were made of the variation of specific heat and density of binary mixtures of olive oil with benzene, carbon disulphide, carbon tetrachloride, and trichloroethylene, as a function of the concentration at 20°. The results obtained show that the binary mixtures studied behave like ideal solutions as regards the additivity of specific heats and volumes.

HYDROGENATION OF FATS AND OILS. III. RATE OF HYDROGENATION OF A MIXTURE OF FAT ACID AND ITS ESTERS. 1. HYDROGENATION OF A MIXTURE OF OLEIC ACID AND METHYL OLEATE. T. Tsuchiya. *Repts. Tokyo Ind. Research Inst. Lab. 44,* 111-14 (1949). An equimolor mixture of oleic acid and methyl oleate with 5% Ni-Kieselguhr (1% Ni) is hydrogenated with agitation on an oil bath at 180° and samples of various stages of hydrogenation are taken. The rate of hydrogenation is measused by iodine numbers. The formation of stearic acid from oleic acid was 2.28-2.82 times as much as that from methyl oleate. When a mixture of 0.5 mole oleic acid and 1.5 moles methyl oleate was treated in the same way, the formation of stearic from oleic acid was 2.28-2.85 times as much as that from methyl oleate. IV. HYDROGENATION OF A MIXTURE OF OLEIC ACID AND VARIOUS ESTERS OF OLEIC ACIDS. *Ibid.* 116-20. An equimolar mixture of oleic acid with Et-, Pr-, iso-Pr, Bu-, and iso-Amyl esters of oleic acid was hydrogenated. The rate of formation of stearic acid from oleic acid and its esters varies with the esters. (*Chem. Abs. 44,* 1721.)

INDEX OF REFRACTION OF HYDROGENATED OILS. E. Gordon (Lab. Chevreul, Paris). *Bull. mens. ITERG 3,* 410-14(1949). Three batches of peanut oil were hydrogenated in an autoclave in the presence of 0.03% of Raney Ni at 60, 90, and 120°. Curves were constructed showing relations between iodine value and n_D^{45}, n_D^{50}, n_D^{55}, n_D^{60}. The n_D^{60} of peanut oil hydrogenated at 60° decreased from 1.4535 to 1.4455 with iodine value falling from 76.3 to 13.9. With peanut oil hydrogenated at 90 and 120° the *n*'s are somewhat higher (*Chem. Abs. 44,* 3272.)

INFLUENCE OF THE ACIDITY OF CRUDE OILS UPON THE HYDRATION OF THEIR LECITHINS. J. Molines and P. Desnuelle. *Oleagineux 5,* 17-19(1950). When oils with more and more acid are hydrated the quantity of hydration water necessary to the satisfactory flocculence of the lecithins increases. This fact must be accounted for by the demucilaginating as well as by the delecithinising of oils. The amount of phosphorus in recovered technical lecithin decreases while its acidity increases with increasing acidity of the oil, particularly when the acidity is in the range of 2.5-6%.

MISCIBILITY OF CASTOR OIL WITH SOME PETROLEUM PRODUCTS. M. H. Domadia and J. G. Kane (Univ. Bombay, India). *J. Sci. & Ind. Research (India) 8B,* No. 11, 208-10(1949). Castor oil is mixed with various petroleum products in different volume ratios and the temperature at which turbidity appeared is determined. The following petroleum products have been used: 3 petroleum ethers, kerosene, Shell BD_2 oil, and 2 white oils. The turbidity temperature increases when small amounts of petroleum products are added to castor oil. At 20° all the petroleum products are miscible with castor oil in equal proportions or in any larger proportion of castor oil. The miscibility of mixtures containing 5 to 50% petroleum products depends on the aniline point of the latter. The lower the aniline point, the higher is the miscibility. (*Chem. Abs. 44,* 3243).

SOLUBILITY OF HYDROXYLATED SOYBEAN OIL IN ETHYL ALCOHOL AND ITS EFFECT ON RUBBER. T. Imata. *J. Nippon Oil Technol. Soc. 2* (4), 1-11(1949). Hydroxylation of soybean oil was effected by heating the oil with 30% hydrogen peroxide and varying amounts of acetic and/or sulfuric acid at 95-105° for 3-4 hours. The acetyl number was highest (137.2) with acetic acid and lowest (63.1) with sulfuric acid (45%). Solubilities of the products in 95% ethanol at various temperatures (75° to —10°) were measured. Vulcanized rubbers immersed in an ethanol solution of the hydroxylated oil showed less swelling when the oil had a higher acetyl number. (*Chem. Abs. 44,* 1268.)

PRELIMINARY NOTE ON FATTY ACIDS OF PEAT. A. Sundgren and V. T. Rauhala. *Suomen Kemistilehti 22B,* 24-32(1949). Fatty acid fractions obtained from Finnish and Swedish peat samples were tentatively identified as being between $C_{23}H_{46}O_2$ and $C_{28}H_{56}O_2$ in composition, though some hydroxyl groups are probably present. (*Chem. Abs. 44,* 3270.)

A STANDARDIZED METHOD FOR FRENCH-FRYING POTATOES. L. M. Alexander, G. E. Schopmeyer, and R. B. Anderson (U.S.D.A.). *J. Am. Dietetic Assoc. 26,* 182-6(1950). Potatoes were pared thinly, cut into strips ⅜ by ⅜ inch in cross section, soaked for 15 minutes in an equal weight of water at room temperature, drained, and dried. Each portion was parfried for 2 minutes with an initial fat temperature at 195° and then given a final fry with initial temperature of fat at 210°, and the final temperature at 180°.

PATENTS

RECOVERING FATTY ACIDS FROM A SLUDGE. J. R. Akers and C. B. Hamlin. *U. S. 2,501,806.* A process of recovering stearic acid in purified condition from a sludge containing stearic acid, aluminum stearate, aluminum particles and impurities by treatment with hydrochloric acid is described.

SOLVENT EXTRACTION APPARATUS AND PROCESS. O. R. Sweeney and L. K. Arnold (Iowa State College Research Foundation). *U. S. 2,501,880.* Solvent and oil are withdrawn through a screen from an extraction zone and the solvent evaporated. The solvent vaporized so as to carry slugs of oil upward through the vaporizing zone and over said screen to clear the same, and then separating the liquid and vapors.

STABILIZATION OF EDIBLE FATS, OILS, AND FOODS CONTAINING FATS AND OILS. F. D. TOLLENAAR. *U. S. 2,502,109.* Tetra-alkylthiuram disulfide is claimed as an antioxidant in fats and oils.

REACTING BLOWN NONDEHYDRATED CASTOR OIL WITH MALEIC ANHYDRIDE, PRODUCTS, AND COMPOSITIONS THEREOF. H. M. Ullmann. *U. S. 2,502,606.* A modified castor oil is claimed which consists of the reaction product of blown castor oil still retaining the hydroxyl groups characteristic of raw castor oil and from 2 to 20% maleic anhydride reacted together at from 70 to 140° for at least one hour and esterified by an aliphatic alcohol of carbon chain length not over seven.

RENDERING FAT. W. M. Leaders (Swift and Co.). *U. S. 2,503,205.* Decolorize fat during rendering by subjecting the fatty tissue to a temperature of about 180°F. for a period of about 5 hours in the presence of liquefied propane in an amount corresponding to a ratio by volume of about 10 parts of propane to 1 part of fatty tissue and maintaining the solvent in the liquid phase whereby color bodies are rejected by the solvent.

PREPARATION OF A STABILIZED CREAM PRODUCT. L. H. Chrysler and E. F. Almy (M. & R. Dietetic Laboratories). *U. S. 2,503,866.* A fluid milk product is treated with a cation exchange material operating in the sodium cycle, until the calcium content of the product is approximately 20 to 70% of normal, thus giving a calcium to phosphorus ratio of about 0.15 to 0.75 and thereby raising the pH of the product. The resulting product is then treated with a cation exchange material operating in the hydrogen cycle until the pH of the original milk product is restored.

UNSATURATED ALCOHOLS. G. Natta. *Italian 420,794.* A process for the hydrogenation of unsaturated acids (without solvents) at 240-280° and 100-300 atm. in the presence of catalysts such as a mixture of copper and cadmium oxides, or copper and tin oxides, prepared by precipitation from mixed solutions of suitable salts. (*Chem. Abs. 44,* 1127.)

ALIPHATIC ALCOHOLS. G. Natta. *Italian 430,809.* In the hydrogenation of free aliphatic acids of high molecular weight to alcohols, along with the catalyst CuO, promoters are used such as ZnO. The mixture CuO-ZnO (resp. 95 and 5%) is obtained by precipitation of Cu and Zn basic carbonates from their salt solutions. (*Chem. Abs. 44,* 1127.)

UNSATURATED HYDROCARBONS FROM SATURATED FATTY ACIDS. T. Tokunaga. *Japan 174,688.* Olefins are obtained by the thermal decomposition of a saturated fatty acid or its Me or Et esters at 300° with a granular catalyst composed of activated acid clay, silica gel, Al_2O_3, or bentonite, and with one or more of Th, V, Ce, Ni, Co, Fe oxide, or hydroxide. Unchanged fatty acid is removed by washing with alkali. (*Chem. Abs. 44,* 3002.)

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• Biology and Nutrition

R. A. Reiners, Abstractor

NON-CALORIC FUNCTIONS OF FAT IN THE DIET. H. J. Deuel, Jr. *Jour. Am. Diet Assoc. 26,* 255(1950). An excellent review.

DETERMINATION OF FAT IN FOODS. M. Th. Francois. *Bull. mens. ITERG 3,* 357-9(1949). A critical survey of (a) the Gerber method for the determination of fat and (b) the methods employing solvent extraction. (*Chem. Abs. 44,* 1618.)

FATS AS FOOD. BRITISH MARINE ANIMALS AS A SOURCE OF FAT. J. A. Lovern (Torry Res. Sta., Aberdeen). *Brit. Jour. Nutrition 2* (2), 184-187(1948). The most important source of marine fat is the whaling industry, the rest comes from such species as sardines, herring, and menhaden. Except for herring there can be little further expansion of marine animal supply. Norway makes an excellent margarine from hydrogenated herring and whale oils. (*Biol. Abs.*, Sect. G, *24* [1], 20.)

FATS AS FOOD. THE WORLD SUPPLY OF FATS. H. J. Channon. *Brit. Jour. Nutrition 2* (2), 176-184(1948). Discussion with statistics. (*Biol. Abs.*, Sec. G, *24* [1], 10.)

FATS AS FOOD. THE FAT REQUIRED FOR COOKING AND TO MAKE FOOD PALATABLE. M. H. Craig *et al. Brit. Jour. Nutrition 2* (2), 187-190(1948). Discussion. (*Biol. Abs.*, Sect. G, *24* [1], 10.)

THE IN VITRO INCORPORATION OF THE METHYLENE CARBON ATOM OF GLYCINE INTO RABBIT BONE MARROW FATS. K. I. Altman (U. Rochester, N. Y.). *J. Biol. Chem. 177* (2), 985-986 (1949). When rabbit bone marrow homogenates were incubated with glycine, labeled with C^{14} in the alpha carbon, it was observed that the fatty acids isolated from the lipid fraction contained appreciable C^{14} activity. The data suggests conversion of glycine to acetate (*Biol. Abs.*, Sect. G. *24* [1], 3.)

THE BIOLOGICAL SYNTHESIS OF LIPIDS. K. Bloch. *Cold Spring Harbor Symposia on Quantitative Biology 13,* 29-34(1948). Deuterium, C^{13}, and C^{14} were used in vitro experiments to assess the roles of acetate and pyruvate in lipid synthesis. Acetate appears to be the preferentially utilized precursor of fatty acids and can serve as the sole source of carbon atoms. Pyruvate can serve as an alternate source of 2-carbon units, probably also as a source of energy for the synthesis; the 2-carbon unit cannot be exchanged for acetate in cholesterol synthesis. Separate processes for synthesizing saturated and unsaturated fatty acids are indicated. (*Biol. Abs.*, Sect. G, *24* [1], 3.)

STUDIES ON OXIDATION OF FATTY ACIDS BY MICROBES. S. Yamaguchi (Tokugawa Inst. Biol. Research, Tokyo). *Rept. Japan Assoc. Advancement Sci. 16,* 431-5(1942). The sodium salts of saturated C_1-C_{18} fatty acids (except C_{13}, C_{15}, and C_{17}) were readily oxidized at 30°C. (as determined by oxygen consumption and CO_2 production) in the presence of *Ps. aeruginosa* or *Micrococcus ochraceus* at all concentrations studied (0.03 M for the C_1, 0.02-0.01 M for the C_2-C_5, and 0.01-0.005 M for the C_6-C_{18} acids). The oxidation velocity as tested in the optimum concentration remained almost unchanged, irrespective of the number of carbons in the acids and was greater generally than that of glucose, lactic acid, and succinic acid. From the CO_2 produced the acids were oxidized completely or nearly so. (*Chem. Abs. 44,* 3089.)

ABILITY OF HEM TO CATALYZE THE OXIDATION OF EASILY OXIDIZABLE SUBSTANCES BY PEROXIDES OF FATS AND FATTY ACIDS. J. Glavind and S. Hartmann (Polytech. Inst., Copenhagen,. Denmark). *Acta Chem. Scand. 3,* 914-17(1949). The oxidation of such compounds as benzidine, guaiac resin, leuco malachite green, leuco 2,6-dichlorophenolindophenol by peroxides of fats and fatty acids is catalyzed by hem. Faster reactions and more intensive colors may be obtained when hem is used in the form of imidazole-, pyridine-, or other hemochromogens. The reaction is mostly readily seen when performed on filter paper. (*Chem. Abs. 44,* 3059.)

DEMONSTRATION OF GLYCOGEN AND LIPIDS IN THE CYTOPLASM OF HUMAN NEUTROPHILIC LEUCOCYTES. O. Eränkö. *Nature 165,* 116(1950). A method of staining cytoplasm of the neutrophilic human leucocyte is given which clearly shows the presence of lipoid granules.

HISTOCHEMICAL STUDY OF FAT DEPOSITS IN CHRONIC INTOXICATION OF THE DOG BY γ-HEXACHLOROCYCLOHEXANE. M. A. Gerebtzoff, M. F. Dallemagne, and E. Philippot (Univ. of Liege). *Nature 165,* 573(1950). Chronic intoxication due to γ-hexachlorocyclohexane resulted in abnormal intracellular deposits of fat in most tissues and organs. These deposits are formed by a mixture of saturated and unsaturated glycerides and of lipins, mostly in an easily oxidizable or an oxidized form.

RELATION OF VITAMIN E DEFICIENCY TO TISSUE PEROXIDES. H. Dam (Polytech. Inst., Copenhagen, Denmark). *Ann. N. Y. Acad. Sci. 52,* 195-9(1949). Histochemically, peroxidation of the fat of vitamin E-deficient rats was shown to precede the formation of the brown pigment, but the pigment did not always show peroxidation. It is likely that the pigment represents stages of oxidation and polymerization of highly unsaturated fat acids beyond the peroxide stage. (*Chem. Abs. 44,* 3103.)

THE STABILITY OF CAROTENE SOLUTIONS TOWARD OXIDATION. W. A. McGillivray. *J. Soc. Chem. Ind. 69* (1), 39 (1950). The rates of decomposition of carotene in liquid paraffin and in hydrogenated coconut oil at 100° with forced aeration have been investigated. In the case of paraffin containing less than 50 μg./ml., the rate is shown to be proportional to the log. of the concentration. The spectral changes occurring during oxidation at 100° and irradiation at room temperature have also been followed and it is shown that the estimation of vitamin A in the presence of oxidized carotene by direct spectroscopic measurement is possible provided a simple correction is applied.

THE EFFECT OF BIXIN AND CAROTENE ON THE OXIDATION OF METHYL LINOLEATE. H. D. Kinkel and W. L. Nelson. *J. Biol. Chem. 183*, 149(1950). The relation of spectral changes to oxygen uptake in the coupled oxidation of bixin and methyl linoleate dissolved in triacetin was studied. Bixin is nearly completely decolorized before 10% of the ester is oxidized. The presence of α-tocopherol inhibits decolorization of both bixin and carotene until the end of the induction period, after which the destruction of the carotenoid takes place rapidly. An antioxygenic effect is exhibited by bixin in the early phases of the light-catalyzed oxidation of linoleate. Also bixin acts synergistically with α-tocopherol to produce a markedly extended induction period.

ABSENCE OF VITAMIN A IN LIVER OIL OF THE BROWN SHARK. F. B. Sanford and K. Bonham. *Science 111*, 475(1950). The oil from the livers of two specimens of brown shark was found to be lacking in vitamin A.

STEROL FORMATION IN THE ANIMAL BODY. III. INFLUENCE OF EDIBLE OIL AND EGG YOLK LIPIDS ON DEPOSITION OF CHOLESTEROL AND GLYCOGENS. I. Abelin (Univ. Bern, Switz.). *Helv. Physiol. Pharmacol. Acta 7*, 427-36(1949). The addition of both 10% of salad oil and 10% of fresh raw egg yolk to the stock diet of rats produced a marked increase in the cholesterol of the adrenals, liver, and skin and some increase in liver and muscle glycogen. Growth was accelerated. When 1 g. sucrose per 100 g. body wt. was given to the rats, the lipid fed group converted more of it into glycogen than did the controls. During the first hour after ingestion of the sucrose the cholesterol of the adrenals showed a sharp decrease. Later, the original level was restored. (*Chem. Abs. 44*, 3116.)

STUDIES ON THE CHOLESTEROL METABOLISM OF THE MOUSE. IV. CHOLESTEROL DEPOSIT BY FEEDING VARIOUS OILS AND FATS. G. Schettler. *Biochem. Z., 319*, 444-52(1949). The ratio of free cholesterol to cholesterol esters is 3:1 in the blood of mice fed oats and skimmed milk; in the liver the ratio is about 7:1. and in the kidney 11:1. Spleen and lung contain practically only free cholesterol. Feeding sesame oil does not materially change the total cholesterol content of organs or blood but causes an increase in the cholesterol esters of the spleen and kidney, and the body weight diminishes. Feeding mice on depot fat of the dog raises the fat and cholesterol content, but large quantities are poorly tolerated and do not result in raising the blood cholesterol, but may actually cause a fall. Linseed oil feeding finally results in death to the mouse. About 40% of fed cholesterol in retained, and an omniverous animal can store it from alimentary sources. (*Chem. Abs. 44*, 1568.)

SPECTROCHEMICAL (ABSORPTION AND FLUORESCENCE) STUDY OF THE SALKOWSKI REACTION: SITOSTEROL, STIGMASTEROL, ERGOSTEROL, AND ZYMOSTEROL. C. Dhere and L. Laszt. *Compt. rend. soc. biol. 143*, 444-7(1949). Stigmasterol and sitosterol give a Salkowski color reaction much like that of cholesterol. The sterols were dissolved in chloroform treated with 91% sulfuric acid and the tubes were allowed to stand several days in daylight. Under these conditions the chloroform layer containing cholesterol showed no green fluorescence, that containing stigmasterol, fluoresced olive green, and that containing ergosterol showed a strong green fluorescence. Further examination of the last named showed 4 absorption bands of which the 2 strongest were at 492 and 576 mμ. Zymosterol gave an orange color which changed to purple then red upon standing several days. The chloroform layer then showed strong absorption bands at 485 and 575 mμ., and fluoresced dark green under the mercury lamp. (*Chem. Abs. 44*, 1365.)

PARTICIPATION OF PHOSPHOLIPIDS IN THE ABSORPTION OF FATS FROM DIFFERENT REGIONS OF THE INTENSTINE OF THE DOG. P. Favarger (Univ. Geneva, Switz.). *Helv. Physiol. Pharmacol. Acta 7*, 371-81(1949). Trielaidin was fed to dogs which were killed 6.5 hours later. The intestine was divided into 3 portions, and from each was removed a superficial layer (epithelium), a deeper layer (villi), and the remainder of the mucosa. The concentration of total phospholipids, and especially newly formed phospholipids, was always higher in the anterior portion of the epithelium and villi. Glycerides and fat acids were more abundant in the epithelium of the distal portions. In all portions the epithelial layer contained more newly formed phospholipids than the deeper layers. (*Chem. Abs. 44*, 3116.)

THE DIGESTIBILITY OF POLYMERIZED OILS. S. Lassen, E. K. Bacon, and H. J. Dunn (Van Camp Labs., Terminal Island, Calif.). Arch. Biochem. *23* (1), 1-7(1949). By means of molecular weight determinations on polymerized sardine oil of various degrees of polymerization as well as on their resulting fatty acids, it was found that intermolecular dimers were largely formed. Using rats and the fat balance method for determining the coefficient of digestibility, it was found that the digestibility of polymerized sardine oil decreased as the degree of polymerization increased. (*Biol. Abs.*, Sect. G, *24* [2], 5.)

PARENTERAL NUTRITION. IX. FAT EMULSIONS FOR INTRAVENOUS NUTRITION IN MAN. G. V. Mann, R. P. Geyer, D. N. Watkin, and F. J. Stare (Harvard Med. Sch., Boston). *Jour. Lab. and Clin. Med. 34* (5), 699-712(1949). Fat emulsions for intravenous use containing 15% fat were stabilized with the combination of a soybean phosphatide preparation and a polyglycerol ester at concentrations of 0.5 and 1% respectively. Such emulsions are well tolerated in animals and in man. Up to 600 ml. were given to human patients without reactions and at post mortem examination there was no gross or microscopic evidence of pathologic changes related to the fat infusions. Slow development of pyrogens seems to occur over a period of 4 weeks, but it is not bacterial in origin. (*Biol. Abs.*, Sect. G, *24* [1], 11.)

NUTRITIONAL EVALUATION OF THE ISO-OLEIC ACIDS: ELAIDIC, PETROSELINIC AND PETROSELINELAIDIC ACIDS. H. Sherman, M. Campling, W. Lange, and R. S. Harris (Mass. Inst. Tech. Cambridge). *Fed. Proc. 8* (1), 396-397(1949). An abstract (*Biol. Abs.*, Sect. G, *24* [1], 12.)

THE BIOCHEMICAL AND PHYSIOLOGICAL STUDY OF CABBAGE PALM PRESS CAKE. M. C. Malkar and P. Rombauts. *Oleagineux, Suppl. Jan. 1950*, 1-12. The press cake of the cabbage palm cannot be classified among the most valuable press cakes but it does have a definitely more favorable phospho-calcium content than peanut press cake. Cabbage palm press cake shows a good distribution of amino acids; the proportion of lysine is relatively high and vitamin content is not seriously affected by heating. Used as an exclusive diet, this cake is a complete food. It gave positive balances for all the studied metabolisms, proteins, glucides, phosphorus, calcium, and manganese. The biological value of these proteins is almost as high as that of casein. The stability of the proteins to prolonged heat treatment gives the industry a wide choice of extraction processes. The authors have studied the supplementation of this press cake and conclude that it is apparently not necessary because of the good distribution of amino acids. The good influence of this feed on the milk production of cows and on the growth of cattle in general, particularly if the oil is not completely removed from the cake is emphasized.

LONG-CHAIN UNSATURATED FATTY ACIDS AS ESSENTIAL BACTERIAL GROWTH FACTORS. SUBSTANCES ABLE TO REPLACE OLEIC ACID FOR THE GROWTH OF CORYNEBACTERIUM "Q" WITH A NOTE ON A POSSIBLE METHOD FOR THEIR MICROBIOLOGICAL ASSAY. M. R. Pollock, G. A. Howard, and B. W. Boughton (Lister Inst., London). *Biochem. J. 45*, 417-22(1949). The diphtheroid bacterium requires oleic acid for its growth. Saturated fatty acids (lauric, myristic, palmitic, and stearic) could not replace oleic. Linoleic, linolenic, palmitoleic, elaidic, and petroselinic were more or less equivalent to oleic but the first 3 in higher concentration were inhibitory. Acids like brassidic, α,β-oleic, or ricinoleic were inactive. A microbiological method for determining oleic acid in concentrations of 2.0 to 10.0 γ/ml. is described. (*Chem. Abs. 44*, 3082.)

MECHANISM OF ANTIBACTERIAL ACTION OF BRANCHED-CHAIN FATTY ACIDS. M. Asano, O. Tamemasa, and H. Motomatsu (Univ. Tokyo). *J. Pharm. Soc. Japan 69*, 381-8(1949). Eight kinds of acids were chosen to test their effect on the growth, respiration, dehydrogenation, and deoxidation by *Staph. aureus*, avian type *M. tuberculosis* and *E. coli*. Acids tested were α-phenyl butyric acid (I), β,β-diheptylpropionic acid (II), dihydrocitronellylbutylacetic acid (III), oleic acid (IV), linoleic acid (V), dihydrorhodinic acid (VI), α-ethyleicosanoic acid (VII), and desoxycholic acid (VIII). Growth, respiration, dehydrogenation, and deoxidation by *Staph. aureus* were prevented by compounds I, II, III, IV, V, and VIII in order of strength. The other acids did not seem to have much effect. With *M. tuberculosis* compounds I, II, III, IV, and V prevented growth, respiration, or dehydrogenase activity while VIII was without effect. With *E. coli* all of the compounds showed no effect on growth and only a weak action in obstructing respiration and the dehydrogenase system. (*Chem. Abs. 44*, 3080.)

Use of thymol turbidity as lipid absorption test. Experiences with thymol turbidity and zinc sulfate turbidity tests under physiologic and pathologic conditions. H. Popper, F. Steigmann, H. Dyniewicz, and A. Dubin (Hektoen Inst., Chicago). *Jour. Lab. and Clin. Med. 34* (1), 105-115(1949). The zinc sulfate turbidity was normal in cases of extrahepatic obstructive jaundice. The ratio between thymol and zinc sulfate turbidity is of practical significance in differentiating acute hepatitis and cirrhosis. Administration of various lipids (butter, choline, egg yolk, and corn oil) raised the thymol turbidity and may serve as a simple test of intestinal absorption of fat. (*Biol. Abs.*, Sect. G, *24* [1], 22.)

PATENTS

Simultaneous defatting and dehydrating of fatty substances. E. M. Worsham and E. Levin. *U. S. 2,503,312.* A process for simultaneously desiccating and defatting biological tissue by comminuting a water and fat containing tissue, then pre-coagulating it at a temperature above about 60° but below 100° under conditions to partially coagulate protein sufficient to prevent agglomeration of the comminuted particles, suspending the pre-coagulated tissue in a distillation zone, with a liquid, water-immiscible fat solvent having a boiling point below about 100° at the pressure employed, the amount of liquid solvent being in excess of that required to dissolve all the fat in the tissue. Distillation is continued until the desired moisture content of tissue is reached and the liquid mixture of solvent and fat is separated from the dehydrated tissue.

Method of extracting vitamin A from cow livers. W. Stevens. *U. S. 2,503,853.* A vitamin A concentrate from cow livers poor in fat is made by subjecting the animal material to the action of a partially water miscible organic solvent selected from the group consisting of methyl ethyl ketone, isobutanol, butanol-2, n-butanol, and pentanol-2 saturated with water to denature the albumens while dissolving the lipoids to produce an extract of the material containing vitamin A.

• Detergents

Lenore Petchaft, Abstractor

Alkyl aryl sulfonate-builder mixtures — detergent properties. Reynold C. Merrill and Raymond Getty (Philadelphia Quartz Company, Philadelphia, Pa.). *Ind. Eng. Chem. 42,* 856-61(1950). Measurements of the ability of alkaline builders to prevent the deposition of iron oxide, ilmenite black, and raw umber on cotton cloth show that sodium silicates and phosphates are more effective than sodium carbonate or hydroxide for this purpose. Dodecyl benzene sodium sulfonate suspended more iron oxide than the builders, less ilmenite than the silicates or phosphates, but usually more than sodium carbonate or hydroxide, and less raw umber than almost any builder. Some silicate-phosphate mixtures appeared to show synergism in preventing deposition. The amount of soil removed by synthetic detergent-alkaline builder mixtures and their relative efficiency varied considerably for three types of "standard" soiled cloth. For a variety of soils, synthetic detergent-alkaline builder mixtures give as good or better detergency than synthetic detergents alone and at lower cost. Synthetic detergents, tetrasodium pyrophosphate, or sodium meta- or sesquisilicate mixtures showed large synergistic effects for one kind of soil.

Detergent development. Reynold C. Merrill (Philadelphia Quartz Co., Philadelphia, Pa.). *Soap Sanit. Chemicals 26,* No. 2, 41-4, 145, 147, No. 3, 48-9, 70, No. 4, 45, 47, 147 (1950). Extensive review article covering history and growth of soap and synthetic detergents, methods of producing soaps, raw materials used in manufacture, development of the new synthetics including classifications, commercial types and uses, builders, optical bleaches, and theory of detergent action.

Low temperature wool piece goods scouring with Nacconol NR—laboratory evaluation. O. M. Morgan and J. E. Walter (Allied Chemical and Dye Corp., Buffalo, N. Y.). *Dyestuffs 40,* 67-75(1950). A series of laboratory scouring tests was conducted at 10°F. intervals over a temperature range of 50-120°F. using 0.5% Nacconol NR solutions with and without 0.5% sodium chloride additions. Results showed that to obtain a residual grease content of less than 1% a temperature slightly higher than 100°F. is necessary when Nacconol NR is used by itself. When sodium chloride is used as a builder, satisfactory scouring may be achieved at 50°F.

Tylose as skin-protective agent in synthetic detergents and wetting agents. R. Kuchinka. *Seifen-Ole-Fette-Wachse 76,* 9-11, 29-31, 51-2(1950). Addition of colloidal solutions of Tylose SAP (methyl ether of cellulose, about 1.5 MeO groups per glucose) and Tylose HB (sodium salt of cellulose glycolic acid) decrease the unfavorable effects on the skin of some synthetic detergents and wetting agents; Tylose SAP has more favorable action than Tylose HB. Quantities of tylose above 2% decrease and change the foam of synthetic detergents. 31 references. (*Chem. Abs. 44,* 3726.)

Is saponin a detergent base? Kurt Lindner. *Seifensieder-Ztg. 73,* 61-2(1947). *Chem. Zentr. 1947,* II, 469. Saponins have certain soaplike properties, e.g. they form colloidal foaming, aqueous solutions. Comparative washing tests showed detergents containing saponins to be inferior to those containing mersolate. Tables and graphs show saponins to have a slight surface activity as compared to mersolate. Thus there is no direct relationship between foaming and detergent properties. The tests indicate that saponins are not a suitable soap substitute. (*Chem. Abs. 44,* 3726.)

The detergency comparator. Clarence L. Nutting (Arlington Mills, Lawrence, Mass.). *Am. Dyestuff Reptr. 39,* 260-1 (1950). A description of the new detergency comparator for use in evaluation of detergents for wool. It may be used to evaluate detergents under the conditions of high concentration and low bath ratio existing under actual operating conditions.

Colorimetric method for determining a surface-active agent. Guy R. Wallin. (Cannon Mills, Kannapolis, N. C.). *Anal. Chem. 22,* 616-17(1950). An acid pH basic fuchsin will react quantitatively with dodecylbenzene sodium sulfate, giving a chloroform-soluble magenta-colored extract which may be measured in a photoelectric colorimeter. The method is accurate and simple. There is no interference from sodium sulfate and the method may be adapted to determine other surface-active agents.

The rapid industrial analysis of soaps and of commercial saponaceous products. A. Parisot. *Olearia 3,* 13-20 (1949). The method is based on separations according to selective solubilities. This allows of a complete and detailed analysis. One can separate and apportion the fatty matters contained in soaps, such as fatty acids combined in the form of soaps, free fatty acids, non-saponified matter (glycerides) and unsaponifiable matter. For this purpose the method avails itself of the solubility of soaps in a hydroalcoholic solution of potassium chloride while the three other constituents are soluble in petroleum ether.

Solubilization and cosolvent effects with sodium stearate. Reynold C. Merrill (Philadelphia Quartz Co., Philadelphia, Pa.). *J. Phys. & Colloid Chem. 54,* 482-8(1950). The effect of organic liquids on the solubility and other properties of high-molecular-weight soaps has been studied. The results showed that solution temperatures of various concentrations of sodium stearate are decreased by potassium stearate, to a greater extent by sodium laurate and also by synthetic anionic and nonionic detergents. Cresol, cyclohexanol, and cyclohexylamine also decrease the solution temperatures of sodium stearate, whereas other organic additives have variable effects. 24 references.

Transparent soaps. Milton A. Lesser. *Soap Sanit. Chemicals 26,* No. 4, 41-2, 98, 145, 147(1950). Extensive review article on history and manufacture of soaps. The transparent soaps are formed by rapid cooling techniques in which the large crystal structure of normal opaque soap does not form. Other factors relating to transparency are use of sugar, use of alcohol and glycerin, addition of castor oil to the above mentioned materials, the proportion of fatty acid in a soap, and the number of times the soap is milled. Methods of production using either cold process or semi-boiled method are reviewed along with hints on cleanliness, care in cutting, and polishing. 19 references.

Fatty alkylolamides in soap. H. W. Zussman and Robert Bernstein (Alrose Chemical Co., Providence, R. I.). *Soap Sanit. Chemicals 26,* No. 4, 37-40, 141(1950). Fatty alkylolamides are prepared by reacting fatty acid with an excess of alkylolamine. A wide range of products are available by varying the concentrations of the reactants. These products are mildly cationic at acid pH's, mildly anionic at alkaline pH's, but act as nonionics in many instances, e.g. they are nongermicidal, completely organic, soluble in all polar and semi-polar organic solvents. They have poor resistance to electrolytes, with certain soils have better detergency on cotton than on wool, show little soil redeposition, and are best used in conjunction with other surface active agents such as soap. In tests with soap, they enhanced the foaming properties of coconut soap even in hard water, they have a dispersing or solubilizing action on lime soaps, they increase the detergency of most soaps in hard water at low temperatures, and they improve the clarity of soap solutions.

Soaps and saponifying agents. Special properties of amino soaps. R. Manschke. *Seifensieder-Ztg. 72*, 187-9(1946); *Chem. Zentr. 1947*, II, 373-4. A report on a number of amino emulsifying agents and the soaps produced from them. (*Chem. Abs. 44*, 3273.)

Methyl esters of fatty acids in the soap industry. E. Schlenker (Fournier-Ferrier, Marseille, France). *Seifen-Ole-Fette-Wachse 76*, 21-2(1950). Review with 11 references. (*Chem. Abs. 44*, 3726.)

Acidimetric properties and structure of the heavy metals soaps. J. P. Wolff. *Oleagineux 5*, 20-23(1950). The soaps of heavy metals such as copper oleate are associated in solution in organic solvents. The degree of association depends on the nature of the solvent and seems to decrease quickly in the presence of polar solvents. The soaps are not very soluble in ethanol and change into fatty acids and metallic hydroxides so that it is impossible to decrease the free acidity of industrial soaps by the usual methods.

Optical bleaches in soap. E. I. Stearns, T. F. Cooke, and H. E. Millson (Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J.). *Soap Sanit. Chemicals 26*, No. 3, 37-40, No. 4, 48-9, 143(1950). Optical bleaches are colorless dyes that fluoresce blue when they are affixed to textile fibers and illuminated with a light source containing ultraviolet light. They impart added whiteness to most off-white products by the double effect of neutralizing the yellow coloration common to most off-whites and increasing the apparent reflectance of white light. In addition, they improve the appearance of blues, violets, purples, pinks, and other colored fabrics that benefit from a reduction of the yellow component. They have a negligible effect on yellows, oranges, reds, and browns. Optical bleaches are found in many different chemical classes having diverse properties. The most important characteristics are absorption in the ultraviolet, fluorescence in the visual, water solubility or dispersibility, fiber substantivity, and certain stability requirements, such as hypochlorite resistance. Some of the important color and application characteristics are strength, shade, build-up, equilibrium exhaustion, and leveling properties. 22 references.

The application of colourless fluorescent dyes. E. C. Caspar. *J. Soc. Dyers Colourists 66*, 177-81(1950). Review of use of colourless fluorescent dyes in the process of "white dyeing" in textile, paper, detergent, and laundry industries, White-dyeing agents can be used in the soap industry for the following purposes: as additives in soap powders, being absorbed by and bleaching the textile during washing, whitening of the soap or soap powder itself, so as to improve its appearance, and as additives in rinsing agents. Relationship of these agents to various types of fibers and their action on them is discussed.

• Waxes

E. H. McMullen, Abstractor

The composition of the wax in Douglas-fir bark. E. F. Kurth (Oregon State College). *J. Am. Chem. Soc. 72*, 1685-6 (1950). The wax extracted with hexane from Douglas-fir bark was examined for its properties and chemical constituents. Based on the saponification products, this wax contains approximately 20% lignoceryl alcohol, 60% lignoceric acid, and 20% ferulic acid (4-hydroxy-3-methoxycinnamic acid). Phytosterol is a minor constituent and oleic acid may be present. The acid constituents are present in both the free and combined states. Other extractives isolated were a hexane-insoluble benzene-soluble reddish-brown wax, dihydroquercetin, tannin, and sugars.

Synthetic waxes. I. E. E. Halls. *Food 19*, 27-8(1950). The uses of waxes in the food industry are discussed. Natural waxes do not usually have all the necessary properties, their availability is limited, and the cost is generally too high. Eleven classes of synthetic waxes having properties similar to those of natural waxes, and their methods of preparation are briefly described. (*Chem. Abs. 44*, 2263.)

Synthetic fatty acid products from the oxidation of paraffin. Gustav Wietzel (Imhausen and Co., Witten-Ruhr, Ger.). *Farben, Lacke, Anstrichstoffe 3*, 416-19(1949). Oxidation by air at 110° under pressure, in the presence of catalysts such as potassium permanganate, or paraffin gatsch (b. 320-450°) from the Fischer-Tropsch process, or of paraffin produced from low-temperature hydrogenated lignite gasification tar, produces a spectrum of fatty acids from formic acid to that equal in C-chain to the starting material. To prevent formation of undesirable keto and hydroxy acids, the conversion is only carried to ⅓. The reaction water containing water-soluble acids is then removed, the fatty acids separated after saponification with aqueous alkali, distilled to remove the balance of unsaponifiables, the soaps acidified, and the fatty acids fractionated under 4-10 mm. The products obtained are forerun acids (C_5-C_9), 10-15% of the crude fatty acids, center cut (C_{10}-C_{18}), about 45%, tail cut (C_{18} up), 5-10%, and residue (polymerized unsaturated acids), 7-15%. The C_5-C_9 acids are used in plasticizers, perfumery, flotation, and certain alkyds, and after transformation to alcohols, in plasticizers, solvents, and surface active agents. The C_{10}-C_{18} acids are used in soap, as food after esterification with glycerol, in Buna rubber, and for hydrogenation to fatty alcohols. The tail cut acids are useful in lubricating oils, mold lubricants, and in rubber. The residue acids are useful raw materials for the paint industry. (*Chem. Abs. 44*, 2260.)

Wax and paint films for engraving. E. E. Halls. *Oil Col. Tr. J. 115*, No. 2637, 1052, 1054, 1056(1949). Fillers for engravings on metal, plastics, etc. must be easy to apply in the cold without powdering, chipping, or flaking but sufficiently firm and solid to withstand fluctuations in warmth and humidity during service. The colors must be light-fast and not bleed into the general surface finish of the article. Suitable fillers, in the form of pencils may be prepared from a wax base (e.g. paraffin, carnauba, etc. with a little linseed oil or a stearate to impart smoothness) pigmented with C-black, ZnO, Cr_2O_3, etc. (*Brit. Abs.* BII, Jan., *1950*, 94.)

PATENTS

Purification of hard waxes by removal of soft fatty components. Royal T. Balch (U.S.D.A.) *U. S. 2,452,093.* Fatty impurities are removed from hard waxes such as sugar cane wax, by cooling a solution of one part of wax in less than one part of a hydrocarbon solvent, adding a fat solvent having little solvent action on waxes such as acetone, and separating the phases. (*Chem. Abs. 44*, 2266.)

Wax polishes. T. G. Hawley, Jr., B. J. Kummer, and J. W. Barnes, Jr. (Diversey Corp.). *U. S. 2,483,701.* Wax emulsion polishing compositions containing carnauba and similar waxes may be improved by the inclusion of maleic anhydride modified glycerol-rosin esters. One composition consisted of carnauba 6.1, oleic acid 1.8, monoethanolamine 1.05, a resin 4.05 consisting of maleic anhydride 14.1, rosin 72.8, and glycerol 13.1%, and water 87%. The wax and resin are melted together at 325°F., cooled to 225°F., oleic acid is added, and the mass stirred until homogeneous. It is cooled slowly to 205-210°F. and the monoethanolamine is added. About 50% of the water heated to the same temperature is added with stirring, holding the temperature until emulsified. It is diluted with the remaining water, at room temperature, cooled to 90-100°F. and packaged. The resin composition can vary as follows: maleic anhydride 5 to 14.1, rosin 86 to 72.8, and glycerol 9 to 13.1% (*Chem. Abs. 44*, 2266.)

Sugar cane wax. Edward A. Wilder (S. C. Johnson & Son, Inc.). *U. S. 2,490,722.* Six parts of crude sugar cane wax are melted at 85°. Sixteen parts of acetone are placed in a kettle provided with a water jacket for cooling. The acetone is stirred by means of an agitator at 15-20°. After agitation is started, the molten wax is poured into the solvent. The hard wax is recovered by filtering the wax suspension. Other solvents may be employed, such as diethyl ether, heptane, hexane, or pentane.

A waxy substance from a high distillate of cypress oil by hydrogenation. Shiono Drug Manufg. Co. *Japan 154,782.* The distillate of Chamaecyparis obtusa oil (b. 132-144°/5 mm.) on hydrogenation gave a 90% yield of a white waxy substance, melting at 45-75°, which was composed chiefly of dihydrosesquiterpenol mixed with tetrahydrosesquiterpene. The compound makes a good ointment or cosmetic base. (*Chem. Abs. 44*, 1234.)

• Drying Oils

Robert E. Beal, Abstractor

The seed fat of *Parinarium laurinum*. Part I. Component acids of the seed fat. J. P. Riley (University of Liverpool, England). *J. Chem. Soc. 1950*, 12-18. The fatty acids from the seed fat (I.V. 180.8) were fractionally crystallized from light petroleum and ether and the fractions examined. By determination of the permanganate oxidation products and of the ultra-violet absorption spectrum pure parinaric acid (octadeca —9:11:13:15-tetraenoic acid) was identified in one fraction. Another fraction was shown by similar treatment together with preparation and examination of the maleic anhydride adduct to contain α-elaeostearic acid. Oleic and linoleic acid were identified as the non-conjugated unsaturated acids present by preparation and examination of their di- and tetra-hydroxystearic acids and palmitic acid was found after hydrogenation and fractional crystallization of the methyl esters of the mixed acids. The composition is given as 53.5 parinaric, 30.5 α-elaeostearic, 1.5 conjugated octadecadienoic, 2 linoleic, 7.5 oleic, 4 palmitic, and 1% stearic acid.

SOME PROPERTIES AND USES OF HIGH IODINE FALKIDINE DRYING OILS. S. S. Gutkin. *Am. Paint J. 34,* No. 28, 78-9, 82, 84, 86-7,90-1, 94, 96(1950). *Paint Oil Chem. Rev. 113,* 12-13, 32-33 (1950), The oil obtained by liquid-liquid extraction with liquid propane, has an iodine value of about 220, color 6, saponification value 190. Source of the original oil is not given. Addition of 40% of the oil to linseed oil or addition of 20% of the oil to soybean oil doubles the bodying rate of these oils. The color of the products is improved by the shorter heating required but the acid number is not lowered. The oil (60) with soybean oil (40) is compared to linseed oil in bodying rate and color. A maleic ester gum varnish from the oil (60) and dehydrated castor oil (40) was faster drying than the same varnish from linseed oil but had less alkali and water resistance. A rosin modified phenolic varnish from the oil (60) with dehydrated castor oil (40) was better than the same varnish from linseed oil.

THE ABSORPTION OF OXYGEN BY LINSEED OIL AND ITS EFFECT ON THE PROPERTIES OF THE OIL. W. Schlick. *Farben, Lacke, Anstrichstoffe 3,* 303-16(1949). Samples of linseed oil (25 g.) were exposed to air in Petri dishes under various conditions. Raw oil gained 65-85 mg./100 g. in the dark at 15° during 130-2 days while refined oil gained 795-835 mg./100 g., indicating the antioxidant effect of muciliaginous matter. Raw oil bleached quicker and oxidized faster in September than in November because of the greater amount of light available. Bleaching and weight gain which occur in the dark are attributed to oil peroxides. The iodine values, hexabromide numbers, and Lea peroxide numbers were, respectively, 176, 51.5 for the raw oil; 159.3, 35.1, and 330.5 for the bleached oil (1.8% wt. gain); and 126.9, 17.3, and 610 for the oil at the start of skinning (6% wt. gain). During this oxidation efflux viscosity increased from 45 seconds to 9 minutes and the drop number increased from 57 to 87. The drop number was suitable for indicating the grinding behavior of the oil. From studies of heat-bodying linseed oil it is concluded that heating in air is preferable to heating under carbon dioxide as the bodying is faster and the products dry more quickly and have excellent color. (*Chem. Abs. 44,* 850.)

CONVERSION OF EPOXY COMPOUNDS TO CONJUGATED DIENES. J. A. Crowder and A. C. Elm. *Ind. Eng. Chem. 41,* 1771-3 (1949. Epoxy esters and acids were converted to dienes for possible use in making drying oils. θ,ι-Epoxystearic acid heated 5 minutes at 285-300° with 0.1% p-methyl benzene sulfonic acid yielded products containing 40.7% conjugated double bonds. The methyl ester of θ,ι-epoxystearic acid and epoxidized linseed oil yielded products containing 9.6-32.5% conjugation under similar conditions. The monopropanoate of θ,ι-epoxystearic acid yielded 57.5% conjugated products after 45 minutes at 310-360° and the methyl ester of this propanoate similarly gave 60% conjugated products. The methyl esters of θ,ι-diacetoxystearate, θ,ι-dicaproyloxystearate, and θ,ι-dilauroyloxystearate gave 39.9 53.5, and 42% conjugation respectively at 340-360° and 140 mm. pressure for 45 minutes. (*Chem. Abs. 44,* 533.)

THE PREPARATION OF ALKYDS AND ADDITIONAL ESTERS FOR FILM STUDIES. J. R. Chipault, M. J. Hendrickson, and W. O. Lundberg. *Official Digest Federation Paint & Varnish Prod. Clubs 300,* 53-60(1950). Methods of preparing various alkyd resins, glycerol esters, and pentaerythritol esters from pure oleic, linoleic, linolenic, or eleostearic acids are described. Eleostearic acid esters and pentaerythritol alkyds were obtained by double ester interchange reactions and other products were prepared by direct esterification. Iodine and saponification values of the products agreed well with theoretical values.

PROCESS OF COOKING LINSEED OIL—RESULTS OF CRYOSCOPIC, VISCOSITY, AND ABSORPTION — SPECTRA MEASUREMENTS. E. Schauenstein and I. Schober. *Osterr. Chem. Ztg. 50,* 2-5(1949). From determinations of molecular weight and viscosity in benzene solution of samples taken during the preparation of linseed stand oil and from consideration of ultraviolet absorption and refraction measurements reported by other workers, the reactions which occur are discussed. During the first 12 hours of cooking (temperature not specified) polymerization is largely intramolecular, followed by intermolecular reactions and the formation of dimers. Catalysts which promote conjugation accelerate polymerization as well. (*Chem. Abs. 44,* 849.)

TRANSFORMATION OF PAINT FILMS. III. FILMS OF CONDENSED LINSEED OIL. A. V. Pamfilov, E. G. Ivancheva, and V. P. Granenova. *Zhur. Priklad. Khim.* (J. Applied Chem.) *22,* 87-100(1949). Unpigmented films (30-50 μ thick) of three samples of linseed oil polymerized to different degrees exhibited tensile strength and elasticity while films from linseed oil did not and films from oxidized linseed oil did only slightly. Films became brittle after several months and the addition of certain pigments retarded this action. (*Chem. Abs. 44,* 847.)

DRYING OILS. G. Fearnley (International Paints, Ltd., Canada). *Official Digest Federation Paint & Varnish Production Clubs 301,* 157-60(1950). A review.

ANALYTICAL CHARACTERIZATION OF ALKYD RESINS. N. W. Hanson (Imperial Chemical Industries, Ltd., Slough, Bucks, England). *Paint Oil Chem. Rev. 113,* No. 4, 16-18, 42, 44, 46-7 (1950). c.f. *J. Oil & Colour Chemists' Assoc. 1949,* April. Identification of drying oil acids in oil modified alkyd resins is discussed.

PATENTS

ISOMERIZATION OF FATTY OILS. S. B. Radlove (The Maytag Co.). *U. S. 2,501,851.* A fatty oil is continuously pumped through a catalyst mass consisting of 0.2 parts nickel on 1 part unground carbon while maintaining the oil and catalyst at 150-200°C. under an inert atmosphere, and collecting from the catalyst an isomerized oil.

COMPOSITIONS OF PHENOL OIL CONDENSATES AND POLYEPOXIDES. S. O. Greenlee (Devoe & Raynolds Co.). *U. S. 2,502,-145.* The product from condensing 2 mols. of phenol and 1 mol. of drying oil is reacted with resinous polymeric polyether derivatives of polyhydric phenols having alternate aromatic and aliphatic nuclei united through ether O and having terminal epoxide groups, in the proportions of from 1 to 3 parts resinous epoxides to 1 part phenol oil condensate to form a drying composition.

LINOLEUM COMPOSITIONS. J. S. Heckles (Armstrong Cork Co.). *U. S. 2,502,457.* The composition comprises a drying oil gel, a filler, and a mixture of 40-95% of a vinyl chloride-vinyl acetate copolymer containing about 10% vinyl acetate of which 20-50% of the acetate groups have been hydrolyzed and 5-60% of a plasticizer for said copolymer.

DEXTRAN BASE WRINKLING COMPOSITIONS. E. L. Luaces (New Wrinkle, Inc.). *U. S. 2,503,622-3-4.* The coating composition consists of a wrinkling drying oil and dextran butyl ether or other similar ether, certain binary mixtures of ethers, or dextran acetate mixed at room temperature in the ratio of 100 parts oil to 10-50 parts dextran compound.

TALL OIL ESTERS AND PROCESS OF MAKING THEM. J. B. Rust (Montclair Research Corp. and Ellis Foster Co.). *U. S. 2,503,-772.* Tall oil, a polyhydric alcohol, and a dicarboxylic acid monoester of a β-unsaturated 3-4 carbon alcohol are reacted together in certain proportions to form a coating composition.

SYNTHETIC DRYING COMPOSITIONS. S. O. Greenlee (Devoe & Raynolds Co., Inc.). *U. S. 2,504,518.* The composition is a mixed ester of maleic anhydride and oleic acid with a high molecular weight polyhydric alcohol, the proportion of oleic acid being less than the weight of alcohol and of the maleic anhydride being 2.8-19.6% of the oleic acid. The alcohol is a polymeric polyether derivative of 4,4′-dihydroxydiphenyl-2,2-propane having alternating aliphatic chains derived from epichlorhydrin and aromatic nuclei derived from 4,4′-dihydroxydiphenyl-2,2-propane united through ether oxygen and being free of functional groups other than epoxy and hydroxyl groups.

DRYING OILS AND PROCESS OF MAKING SAME FROM CLAY TOWER POLYMERS. C. Schneider (Phillips Petroleum Co.). *U. S. 2,505,148.* Polymer liquid formed in a clay tower process for treating vapors of a petroleum fraction in the manufacture of gasoline, is distilled to remove substance boiling below 400°F. and the kettle product is fractionated at 22-40°F. by means of a selective solvent into a naphthalene-rich fraction and a naphthene-rich fraction having an iodine value of approximately 250 and being suitable for use as a drying oil.