green color, has a grassy odor, and deposits a wax-like gel on standing.

Properties of the Oil: Using the crude oil and following standard procedures (2, 3) the data given in Table II were obtained.

TABLE II

Chemical and Physical Properties of Crude Lespedeza Seed Oil

Property	Value
Specific gravity (15.5°C.)	0.924
Refractive index (25°C.)	1.4739
Solidification point (°C.)	—15 to —20°
Iodine number (Wijs)	147.20
Acid number	21.00
Saponification number	148.95
Unsaponifiables (%)	5.60
Drying time (hours)	4.75

The crude oil dried to a tacky film in 36 hours at 32°C. Addition of 0.05% cobalt naphthenate reduces the drying time to 4.75 hours.

Purification of the Crude Oil: A weighed sample of the oil was dissolved in six volumes of 60-90° petroleum ether and refluxed for 15 minutes with 0.4 g. of activated carbon per gram of oil. The solution was filtered through infusorial earth and centrifuged to remove sediment. Evaporation of the solvent gave 95% recovery of a light yellow, non-cloudy oil, n_D^{25} 1.4758.

Discussion

The preliminary data reported here show that lespedeza seed oil is a highly unsaturated oil to be classed with the semi-drying oils. The crude oil has a high acid number, which may be reflected in a lengthened drying time. The low saponification number is also unusual. After correcting for unsaponifiables and free acid, the molecular weight is in the range of the $C_{22\text{-}24}$ acid glycerides. The available data should be further established before this unusual conclusion is accepted. The data presented however indicate potential utility of this oil and suggest further studies, which are in progress and will be reported.

Summary

Lespedeza seed oil has been isolated by extraction of the pulverized seed with diethyl ether, petroleum ether, hexane, and tetrachloroethylene in 11.1-11.7% yield. The crude oil has been characterized by a number of standard tests. Its outstanding properties are its iodine number of 147 and its ability to dry.

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3. Shriner, R. L., and Fuson, R. C., "Identification of Organic Compounds," New York, John Wiley and Sons, 1948.

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☆ ☆ ☆ ABSTRACTS ☆ ☆ ☆

Oils and Fats

Edited by
M. M. PISKUR

FAT DETERMINATION IN FECES USING MOJONNIER EXTRACTION FLASKS. U. Soderhjelm, Med. Lic., and L. Soderhjelm, Med. Lic. (Galveston, Texas). *J. Lab. & Clin. Med. 34,* 1471-2(1949). The method described offers several advantages. There is little loss of feces in the preparation and transfer of the material. The extraction can be completed in a very short time and emulsification rarely occurs. Duplicate samples agreed within narrow limits, except in two instances where the fat content was less than 1 per cent of the sample.

THE CORROSION OF LEAD BY XYLENE SOLUTIONS OF LAURIC ACID AND *p*-QUINONE. C. F. Prutton and J. H. Day (Cleveland, Ohio). *J. Phys. & Colloid Chem. 53,* 1101-17(1949). Lead is rapidly corroded by oxygen-free xylene solutions of *p*-quinone and lauric acid, neither of which by itself attacks lead appreciably. The reaction rate is increased by the presence of water and is unaffected by the presence of lead laurate.

A MONOLAYER STUDY OF THE ISOMERISM OF UNSATURATED AND OXY FATTY ACIDS. V. L. Schneider, R. T. Holman, and G. O. Burr. *J. Phys. & Colloid Chem. 53,* 1016-29(1949). Force-area curves of monolayers have been studied and compared, using the following substances: stearic, oleic, linoleic, linolenic, arachidonic, elaidic, linolelaidic, elaidolinolenic, α and β-eleostearic, pseudoeleostearic, licanic, ricinoleic, ricinelaidic, 9,10-diketostearic, 9-keto-10-hydroxystearic, 9-hydroxy-10-ketostearic, and 9,10-oxidostearic acids. With increasing numbers of double bonds per molecule, the limiting area increases in the naturally occurring unsaturated acids. Trans isomers have smaller limiting areas than cis isomers in the non-conjugated series. In the conjugated acids, trans isomers form condensed monolayers. Ricinelaidic acid monolayers are condensed, whereas ricinoleic acid monolayers are expanded. Close packing and hydrogen bonding in the trans form probably account for the condensed type of film. Intermolecular hydrogen bonding may operate in diketostearic acid monolayers, reducing the apparent limiting area, whereas in hydroxyketostearic acids the molecules show no sign of intermolecular hydrogen bonding, perhaps because of the possibility of intramolecular bonding. A study of monolayers of oxidostearic acids which were presumably identical indicated that the preparations were quite different. This study indicates the possibility of isomerism in this acid which is not reflected in melting point differences, and demonstrates the usefulness of monolayer study in the study of isomerism and identity.

THE EFFECT OF ADDED WATER AND ANTIOXIDANTS ON THE KEEPING QUALITY OF LARD. H. J. Lips. *Can. J. Res. 27F.,* 373-81(1949). Moisture alone had little detrimental effect on lard storage life (time at 90°F. to attain a peroxide oxygen value of 10 ml. of 0.002 N thiosulphate per gm.) except at the highest levels of incorporation (up to 12.8%), but citric acid, lecithin, and alpha-tocopherol had more stabilizing action in dry lard than in lard containing water. Gum guaiac gave the greatest increase in storage life and citric acid the least. The stabilization varied with the original quality of the lards tested (two wet rendered, two dry rendered, and two composite lards) but no segregation of the results according to wet and dry rendering of these lards was possible.

THE NATURE AND QUANTITY OF FATTY ACIDS PRODUCED IN BUTTERFAT BY THE ACTION OF MICRO-ORGANISMS. T. Richards and G. M. El-Sadek (Univ. Reading). *J. Dairy Res. 16,* 46-52(1949). The fatty acids have been isolated from 6 samples of butter made rancid with pure cultures of bacteria and moulds, and from 6 samples of naturally rancid butter. The fatty acids have been fractionated into volatile, solid, and liquid groups. The mould samples produced in every case a greater total of fatty acids than bacteria under identical conditions. Bacteria produced relatively less volatile acids than moulds but slightly more solid acids. Of the volatile acids produced it appears that bacteria produce a greater proportion of butyric and caproic acids than moulds. The liquid acids make up by far the greatest proportion of the fatty acids recovered, being in each case between 77 and 85% of the total. Of these, oleic and linoleic probably comprise the majority.

FACTORS INFLUENCING FAT SYNTHESIS BY RHODOTORULA GRACILIS. S. C. Pan, A. A. Andreasen, and P. Kolachov (Louisville, Ky.). *Arch. Biochem. 23,* 419-33(1949). The unusually high fat coefficient of 16-18, and the importance of an optimum nitrogen concentration, which have been reported previously for *Rhodotorula gracilis* in a glucose medium, were confirmed. It was also shown that *Rh. gracilis* could be grown successfully in a molasses medium to produce fat with the same efficiency as in a glucose medium, provided proper amounts of nutrients—$(NH_4)_2SO_4$ alone or with KH_2PO_4—are added to the medium to insure complete sugar utilization.

LIPID SYNTHESIS IN MOLDS *(Phycomyces blakesleeanus)* STUDIED WITH THE ISOTOPE TECHNIC. K. Bernhard and H. Albrecht. *Helv. Chim. Acta 31,* 2214-20 (1948). From mold grown on a D_2O enriched glucose containing nutrient solution, ergosterol, and fatty acids (palmitic, stearic, oleic, linoleic, γ-linolenic, behenic, tetracosanoic, tetracosenoic, hexacosanoic, and hexacosenoic) various lipids were isolated. These substances contained approximately 2/3 of the deuterium of the medium. (*Chem. Abs. 43,* 5821.)

ON THE LIPOPROTEIN PARTICLES OF YEAST CELLS. M. A. Nyman and E. Chargaff. *J. Biol. Chem. 180,* 741-6 (1949). This paper discusses the isolation and composition of the submicroscopic lipoprotein particles of yeast cells. This fraction was found to contain 22-26% of lipids, the unsaponifiable portion of which was rich in ergosterol. The composition of the lipids and the distribution of phosphorylated compounds in these particles were investigated.

METABOLISM OF ACID FAST BACTERIA. II. BEHAVIOR OF UNSATURATED FATTY ACIDS. W. Franke, Li-Tsoung Lee, and D. Siewerdt-Kibat. *Biochem. Z. 319,* 263-82 (1948). The *cis* forms of unsaturated fatty acids with 18 C atoms generally have a smaller stimulating or greater inhibiting effect on respiration of *Mycobacterium rubrum* and *M. phlei* than do the *trans* forms. The inhibiting action on respiration increases rapidly with the increase in double bonds, especially in the presence of an easily oxidizable substrate. In microbiological experiments the unsaturated fatty acids do not seem to be attacked at the double bond but more likely near the carboxyl group. (*Chem. Abs. 43,* 5082-3.)

LECITHINASE AND CHOLESTEROL ESTERASE IN HUMAN PLASMA. H. Benard, P. Desgrez, A. Gajdos, F. Lambotte, and M. Polonovski. *Bull. soc. chim. biol. 31,* 170-6(1949). It is believed that in the plasma, cholesterol esterase forms cholesterol esters with fat acids liberated from lecithin by lecithinase. In normal plasma the activity of both enzymes varies within rather wide limits. In various liver diseases the average activities are considerably lower than normal. (*Chem. Abs. 43,* 8408.)

TOTAL SERUM-FAT IN HYPERTONY. I. Harris, C. E. Vernon, N. Jacob, and M. E. Harris. *Lancet 257,* 283-5(1949). The total amounts of fat, cholesterol, fatty acid, and phosphatide in serum were significantly higher in patients with high blood pressure. A high fat-low carbohydrate diet raised the serum cholesterol level. Injection of 15-20 units of insulin decreased the serum fat and cholesterol levels. Abnormal glucose tolerance curves were exhibited by 23 of 32 patients with high blood pressure; all 9 controls had normal curves. (*Chem. Abs. 43,* 8522.)

EXPERIMENTAL THORACIC DUCT FISTULA. THE TECHNIQUE, THE ABSORPTION OF FAT AND FLUID FROM THE INTESTINE, AND PROTEIN DEPLETION. Wm. W. L. Glenn, S. L. Cresson, F. X. Bauer, F. Goldstein, O. Hoffman, and J. E. Healy, Jr. *Surg., Gynecol. Obstet. 89,* 200-8 (1949). In the presence of a thoracic duct fistula, administration of olive oil by stomach tube did not cause an appreciable rise in the total lipid fatty acids in the serum at the time of maximum fat absorption as judged by the lipid content of the thoracic duct lymph (1). An increase in the lipid content of I followed the oral ingestion of fluid by dogs whose only food source was glucose or sucrose. With glucose or sucrose as the only food source, a definite increase in the opalescence of I was noted after administration of fluid by mouth up to 7 days after any fat had been given orally. (*Chem. Abs. 43,* 8522.)

THE EFFECT OF DIETARY FAT AND CARBOHYDRATE ON DIETHYLSTILBESTROL-INDUCED MAMMARY CANCER IN RATS. W. F. Dunning, M. R. Curtis, and M. E. Maun. *Cancer Research 9,* 354-61(1949). A diet high in fat shortened the latent period and increased the number of tumors, as compared to one low in fat; this effect of the high-fat diet was removed by caloric restriction. (*Chem. Abs. 43,* 8028.)

PATENTS

COTTONSEED MEAL AND OIL. R. P. Hutchins, Piqua, and W. H. Williamson (Procter & Gamble Company). *U. S. 2,484,831.* Equipment and process is described for extracting cottonseeds with an alcohol-hydrocarbon mixture. The object of the process is to produce non-toxic oil and meal.

SOLVENT EXTRACTION OF COTTONSEED OIL. A. Perez (Phillips Petroleum Co.). *U. S. 2,485,916.* Oil seeds are first extracted with a lower alcohol in the presence of a small amount of soap to remove color materials; the solvent with its dissolved color materials is removed; the seed material is dried and extracted with hydrocarbon.

HEAVY GRAVITY LIQUID SEPARATION OF COTTON SEED. C. H. Boatner, C. M. Hall, and A. L. Merrifield (U. S. Am. Secretary of Agr.). *U. S. 2,482,141.* The cottonseed are disintegrated, mixed with organic solvent of density greater than the pigment glands, the mixture is settled and the floating glands are removed. The solvent used is a mixture of CCl_4 and vegetable or mineral oil.

RECOVERY OF OILS FROM CELLS OF ANIMAL AND VEGETABLE MATTER. J. W. Beckman (Marian O. Palmer). *U. S. 2,486,385.* In a fermentation process for release of oil from organic materials, the steps consist of complete reduction of the material to particles of a microscopic but multicellular size and subjecting to a controlled enzymatic fermentation for release of the oil from the cells.

TREATMENT OF OIL-BEARING VEGETABLE MATERIALS FOR RECOVERY OF OIL. J. W. Beckman (Marian O. Palmer). *U. S. 2,486,384.* A process for recovering fats from cellular organic materials consists in comminuting the material, heating the comminuted material to inactivate fat-hydrolyzing enzymes, cooling, subjecting the cooled material to enzymatic protein degradation, and recovering the fat.

FAT HYDROLYSIS PROCESS AND APPARATUS. A. C. Brown (Emery Industries, Inc.). *U. S. 2,486,630.* The process is adapted to be carried out utilizing water alone as a hydrolyzing agent.

SELECTIVE ENZYME HYDROLYSIS OF FATS. J. H. Sanders (The Procter & Gamble Co., Ohio). *U. S. 2,485,779.* Fish oils are treated with lipolytic enzymes at 80-110°F. until the fatty acid content has materially increased. In the process there is a preferential liberation of saturated and least unsaturated acids thus yielding a method of fractionating the oils into a drying oil fraction and acids suitable for soap making.

FATTY ACID ESTERS. W. R. Fish (Swift & Co.). *U. S. 2,486,938.* The present invention effects the continuous esterification of fatty acids with low molecular weight alcohols by a process wherein the acid to be esterified is substantially insoluble in a mixture of alcohol and catalyst and also the ester product is substantially insoluble in the catalyst-alcohol solution. An alcohol-catalyst mixture is employed which bears such a density relationship to the fatty acid and the ester product that a countercurrent operation is possible.

STEARIC AND ABIETIC ACID FROM HYDROGENATED TALL OIL. D. F. Othmer and G. Papps. *U. S. 2,486,974.* The hydrogenated tall oil is adsorbed on activated C and on fractional elution 3 fractions are recovered, first a relative pure abietic acid, second a mixture of abietic and stearic acid, and last relatively pure stearic acid.

SEPARATING THE CONSTITUENTS OF TALL OIL. G. E. Taylor, S. Metcalf, and L. Branscomb (Monsanto Chemical Co.). *U. S. 2,487,000.* The tall oil is refined, its fatty acids are converted to the lower alcohol esters and the mixture is distilled to yield a fatty acid fraction, an intermediate fraction containing abietic acid, and a small quantity of fatty acid and resinous pitch. The intermediate fraction is further fractionated by crystallization.

BLEACHING FATS AND OILS. L. F. Henderson and L. H. Libby (Lever Bros. Co., Cambridge, Mass.). *U. S. 2,483,413.* The oils are treated with H_2O_2 or other O_2 liberating compound in the presence of H_3PO_4 and are then treated with bleaching earth.

APPARATUS FOR BLEACHING FATTY SUBSTANCES. A. A. Robinson (Standard Brands Incorporated, N. Y.). *U. S. 2,483,710.* Bleaching agent and fatty oil converge in a conduit system, pass through a vacuum deaerating phase and through heating stages where a bleaching temperature is attained.

PREPARATION OF CAROTENE CONCENTRATE. W. Lange and R. G. Folzenlogen (Procter & Gamble Co., Ohio). *U. S. 2,484,040.* The carotene in oil is reacted with strong acids and it then separates as a separate phase which is recovered.

STABILIZED FATS AND OILS. J. Korner (Silmo Chemical Corp., Vineland, N. J.). *U. S. 2,486,177.* Ammonium gallate or substituted ammonium gallates are used as antioxidants in lard, butter, vitamin oils, and vegetable oils.

STABILIZED GLYCERIDIC OIL. H. W. Vahlteich, C. M. Gooding, and R. H. Neal (Best Foods, Inc., N. Y.). *U. S. 2,485,640.* Animal oils are stabilized with tocopherol and mono-fatty acid esters of citric acid.

MARGARINE AND BUTTER COMPOSITIONS. H. W. Vahlteich *et al.* (Best Foods, Inc., N. Y.). *U. S. 2,485,634* and *2,485,638-9.* The compositions consist of margarine and/or dairy butter, having dialkyl esters of citric acid and dialkylene esters of citric acid, in which the alkyl and alkylene groups have at least 8 carbon atoms.

SOYBEAN OIL PRESERVED WITH ESTERS OF CITRIC ACID. C. M. Gooding, H. W. Vahlteich, and R. H. Neal (Best Foods, Inc., N. Y.). *U. S. 2,485,633.*

SOYBEAN OIL COMPOSITION WITH RESISTANCE TO DETERIORATION. R. H. Neal, C. M. Gooding, and H. W. Vahlteich (Best Foods, Inc., N. Y.). *U. S. 2,485,631.* A composition of matter comprises a deodorized soya bean oil having monoisopropyl citrate.

GLYCERIDIC OIL COMPOSITIONS RESISTING DETERIORATION. POTATO PRODUCTS FRIED IN GLYCERIDIC OIL. STABLE NUT MEATS RESISTING DETERIORATION. H. W. Vahlteich *et al.* (Best Foods, Inc.). *U. S. 2,485,632* and *2,485,635-6.* Mono-fatty acid esters of citric acid are used as the stabilizers.

STABILIZING EDIBLE FATTY OIL. F. A. Lindsey, Jr. and W. T. Maxwell (Southern Cotton Oil Co.). *U. S. 2,486,424.* The process of stabilizing an edible fatty oil comprises adding citric acid and heating the mixture to break down the citric acid into aconitic acid, aconitic acid anhydride, itaconic anhydride, and citraconic anhydride, and arresting the process before decomposition proceeds beyond the formation of more than a minor amount of xeronic anhydride.

METHYL ESTERS OF CASTOR OIL ACIDS. M. K. Smith (Baker Castor Oil Co.). *U. S. 2,486,444.* Alkali metal hydroxides and/or alkali methylates are used as catalyst in the esterification.

PREPARATION OF DIGLYCEROL. W. G. Alsop (Colgate-Palmolive-Peet Co.). *U. S. 2,487,208.* The process for making diglycerol comprises heating glycerol in the presence of a catalyst to a temperature at which condensation-polymerization takes place for a period of time sufficient to produce a substantial amount of diglycerol, deactifying the catalyst, and distilling the reaction mixture to recover unreacted glycerol and diglycerol.

CALCIFEROL CHAULMOOGRATE. H. Penau and G. Hagemann (Usines Chimques des Laboratores Francais, et par abreviation U.C.L.A.F. Paris, France, a French Co.). *U. S. 2,484,526.* A process of preparing pure crystallized calciferol chaulmoograte comprises converting pure vitamin D_2 into the ester by means of pure chaulmoogric acid chloride in the presence of pyridine and benzene. The product is used for therapeutic purposes.

PLASTICIZERS FOR SYNTHETIC RESIN. L. D. Myers and R. W. Webster (Emery Industries, Inc., Ohio). *U. S. 2,485,910.* The method of increasing the compatability of a vinyl resin with an ester of an unsaturated fatty acid and a fatty alcohol containing not over 8 carbon atoms comprises oxidizing the ester to reduce its iodine value by substantially 60 to 90 points.

FLUID PHOSPHATIDE COMPOSITION. H. Wittcoff (General Mills, Inc.). *U. S. 2,483,748.* A phosphatide composition comprises a major proportion of a phosphatide material and at least 5% of an ester of a lower aliphatic monohydric alcohol and a higher fatty acid, sufficient to soften and control the consistency of said composition.

TALL OIL ACID COMPOSITION FOR RUBBER. E. A. Van Valkenburgh. *U. S. 2,483,797.* A tall oil acid composition contains the aliphatic amine soaps of tall oil acids and free tall oil acids, the composition being free from uncombined amine.

PROCESS OF POLYMERIZING A CONJUGATED DIENE IN THE PRESENCE OF A REGULATOR COMPRISING SELECTED AMIDES OF MERCAPTYL UNDECANOIC ACIDS. K. H. Weber (Armstrong Cork Co., Lancaster, Pa.). *U. S. 2,485,682.* In this method of preparing synthetic rubber, sodium stearate is used as the emulsifier.

PREVENTION OF FOAMING IN STEAM GENERATION. P. G. Bird and A. L. Jacoby (National Aluminate Corporation). *U. S. 2,481,899.* A series of compounds, which may be designated as substituted-amino-N-substituted alkanamides, are of a high order of efficiency when used as an antifoaming and antipriming agent in steam generators. These are fat derivatives.

INHIBITING FOAMING IN STEAM BOILERS. L. O. Gunderson (Dearborn Chemical Co.). *U. S. 2,485,378.* Castor oil, together with a fatty acid amide of a hydroxy alkyl amine, is used as a boiler water defoamer.

THE EPOXIDATION OF ESTERS OF OLEIC AND LINOLEIC ACIDS. W. D. Niederhauser and J. E. Koroly (Rohm & Haas Company). *U. S. 2,485,160.* A process for the production of epoxidized soybean oil comprises reacting and epoxidizing the oil with a mixture of H_2O_2 and formic acid, the H_2O_2 being present in a ratio of 1.12 moles for each mole of unsaturation in the oil and the formic acid being present in the ratio of 0.25 to 0.5 mole for each mole of unsaturation in the oil. The products are suitable plasticizers.

FLOTATION OF BARITE ORES. E. W. Gieseke (American Cyanamid Co., N. Y.). *U. S. 2,483,970.* Fatty and tall oil fatty acids and soaps are used as flotation agents in the process.

Drying Oils

Edited by
ROBERT E. BEAL

THERMAL POLYMERIZATION OF LINSEED AND SOYBEAN OILS. I. M. Bernstein. *J. Oil & Colour Chemists' Assoc. 32,* 447-60(1949). Polymerization was carried out at 307° under purified N_2 with careful exclusion of air and with constant stirring and heating in an oil-bath. Linseed oil reached the gel stage in 11 hours and soybean oil in 18 hours (heat-up time 1 hour, 20 minutes). Samples were removed from each oil at hourly intervals and analyzed for viscosity, acid value, I value, molecular weight, and refractive index. When the gelled polymers were saponified 2 hours in boiling alcohol and KOH and acidified, the acids were insoluble in benzene, but under milder saponification conditions, they were 75% soluble and the soluble portion had an average molecular weight of 400. Isomerization and polymerization are believed to occur during saponification. Under the thermal polymerization conditions used here, with an inert atmosphere, it is believed that the oxidation products initially present in the oil are eliminated and the reaction proceeds molecularly by the collision of normal functional groups without the free radical mechanism which probably predominates when oxygenated products are present. Isomerization may not occur and a long reaction time is required before gelation occurs.

STYRENATED OILS AND ALKYDS. A. E. Young, *Official Digest Federation Paint & Varnish Production Clubs 296,* 610-15(1949). Methods of preparation and film properties are described.

TALL OIL VARNISHES — EXPOSURE RESULTS. Northwestern Paint and Varnish Production Club. *Paint, Oil, Chem. Rev. 112,* No. 23, 92(1949). c.f. *Official Digest Federation Paint and Varnish Production Clubs 286,* 845(1948). The results of natural weathering tests which have been completed recently are presented. They do not differ markedly from previously reported accelerated tests.

THE TECHNOLOGY OF TALL OIL. D. L. Emerson, Jr. (University of Florida). *Paint, Oil, Chem. Rev. 112,* No. 24, 13, 14, 26, 27, 30-32. A review and a brief description of some exposure test vehicles are given.

THE DETECTION OF DEHYDRATED CASTOR OIL. J. D. von Mikusch. *Farbe u. Lacke 55,* No. 10, 361-6(1949). The isolation of 10-12-octadecadienoic acid (m.p. 57°) from alkali-isomerized fat acids of dehydrated castor oil is proposed as a satisfactory method of distinguishing dehydrated castor oil from other synthetic drying oils containing conjugation. Suitable laboratory procedures are described. (Note: article incomplete; remainder to appear in subsequent unspecified issue.)

PATENTS

COATING COMPOSITIONS COMPRISING REACTION PRODUCTS OF PENTAERYTHRITOL AND BODIED TRIGLYCERIDE DRYING OILS. H. C. Woodruff (Heyden Chemical Corporation, New York, N. Y.). *U. S. 2,486,353.* The homogeneous reaction product obtained by reacting 15 parts pentaerythritol and 200 parts of substantially neutral heat-bodied linseed oil having a viscosity of approximately Z, at 540°F. in the absence of an alcoholysis catalyst, is suitable for reaction with acidic materials to provide bases for coating compositions.

TREATMENT OF TALL OIL AND PORTIONS THEREOF. S. Koonce and E. S. Perry (Distillation Products, Inc., Rochester, N. Y.). *U. S. 2,485,744.* The fatty acids of tall oil are esterified with a monohydroxy aliphatic alcohol without substantially esterifying the rosin acids, the mixture is then dissolved in a solvent therefor, the rosin acids are removed by selective adsorption on a suitable adsorbent, and the rosin acids are thereafter recovered by elution with a suitable solvent.

DIENE ADDITION PRODUCT AND PROCESS FOR MAKING IT. H. M. Teeter, C. R. Scholfield, and J. C. Cowan

(Northern Regional Research Laboratory, Peoria, Illinois). *U. S. 2,483,791.* A 1,4-diene adduct is produced by reacting a conjugated dienic alcohol derived from a soybean oil fatty acid with ethyl crotonate for 10-20 hours at 175-275°.

DRYING OIL PRODUCTS AND PROCESS OF MAKING SAME. J. B. Rust (Montclair Research Corp., Montclair, N. J.). *U. S. 2,482,736.* A drying oil and a β-unsaturated monohydric alcohol ester of 1,2,3,6-tetrahydrophthalic acid are heated at 200-300° to improve the color stability, gel time, and drying time of the oil.

POLYMERIZATION OF UNSATURATED FATTY ACIDS. C. G. Goebel (Emery Industries, Inc., Cincinnati, Ohio). *U. S. 2,482,761.* A polyunsaturated fatty acid is heated at an elevated pressure and a polymerizing temperature of at least 260°, in the presence of sufficient water to prevent decarboxylation during the heating period, to produce a polycarboxylic acid.

PHENOL ALDEHYDE-PETROLEUM PITCH-DRYING OIL IMPREGNATING COMPOSITION. H. Snow (Southern Friction Materials Company, Charlotte, N. C.). *U. S. 2,485,327.* The thermosetting heat reaction products of a mixture including 1½-2 parts of a phenol-aldehyde, an oil-modified phenol-aldehyde, or a rosin ester-modified phenol-aldehyde, oil-soluble resin, 3-4 parts of petroleum pitch composed of polymerized olefinic hydrocarbons having a minimum I number of about 200 and a boiling range beginning at 450° F., 4-5½ parts of a drying oil, and 1-7½ parts of a petroleum distillate solvent are used for impregnating fabric to render it water and wear resistant.

METHOD OF PREPARATION OF COMPOSITION FABRIC MATERIAL. H. Snow and J. D. Hill (Southern Friction Materials Co., Charlotte, N. C.). *U. S. 2,484,756.* A woven fabric is impregnated with a thermosetting resin composition comprising 45-55% of a drying oil, 15-20% of an oil-soluble phenol-aldehyde resin and 25-40% of pitch comprising polymerized olefinic hydrocarbons having an I number of about 200 and a boiling range beginning at 450°F. The fabric is heated to cure the resin composition and subsequently wet abraided to produce desirable surface characteristics.

ADHESIVE TAPE AND COMPOSITION THEREFORE. J. B. Martin (The Kendall Co. Boston, Mass.). *U. S. 2,484,416.* A polyamide formed by reacting polymeric fat acids from drying or semi-drying oils with a diamine is mixed with 25-150% of a polyvalent metallic salt or a monoamide of fatty acids to form an adhesive composition.

COPOLYMERS OF TETRAHYDROABIETYL ALCOHOL-MODIFIED UNSATURATED ALKYD RESINS AND VINYL COMPOUNDS. E. L. Kropa (American Cyanamid Company, New York, N. Y.). *U. S. 2,485,294.* A mixture including 5-95% of a polymerizable unsaturated alkyd resin chemically modified with tetrahydroabietyl alcohol and 5-95% of styrene are interpolymerized.

Detergents

Edited by
LENORE PETCHAFT

SOFT SOAP MANUFACTURE. J. M. Vallance. *Soap Sanit. Chemicals 25,* No. 11, 40-43, 90, No. 12, 44-5, 90(1949). Review article covering specifications and properties of various soft soaps, requirements of raw materials, formulations of various types and their uses, and manufacturing procedure.

TRENDS IN THE MANUFACTURE OF SOAPS AND DETERGENTS. John Seaman. *Mfg. Chemist 20,* 530-3(1949). The newer developments in soap manufacture reviewed include the use of fat-splitting followed by neutralization of the fatty acids to replace direct saponification, thus allowing the processing of low grade fats, manufacture of detergents not based on glyceride oils, reduction of true soap content by use of builders, and production of synthetic fats and fatty acids.

WHITENING AGENTS IN SOAP. Milton A. Lesser. *Soap Sanit. Chemicals 25,* No. 11, 36-9, 145(1949). Review article on use of new optical bleaches to improve whiteness of clothes. The advantages (no detrimental effects on mechanical properties of the fibers and rapid action) and disadvantages (difference in affinity for different types of fabrics, and build-up on fabrics) are reviewed along with their applications in textile finishes, laundry rinses and in soap. Available trade name products are listed. 26 references.

THE ANALYSIS OF SULFATED FAT ACID-ALKANOLAMINE CONDENSATION PRODUCTS. P. Desnuelle and O. Micaelli. *Oleagineux 4,* 353-7(1949). A method of analysis of the sulfated fat acid alkanolamide type detergents is given which determines total fat acids, free fat acids, fat acid amides, fat acid esters, sulfated fat acid amides, sulfated fat acid esters, and sulfated fat acids. (*Chem. Abs. 43,* 8705.)

ENZYMIC LAUNDRY SOAKING AGENTS. O. Hromatka. *Mitt. chem. Forsch., Inst. Ind. Osterr. 1,* 36-7(1946). Pancreas enzymes are explained and their use for soaking and cleaning textiles is described. The albumin-containing dirt of laundry is disintegrated by the proteolytic enzymes into water-soluble products, so that laundry soiled with blood, pus, and mucus can be easily cleaned. Soiling of fatty nature with dirt particles of soot, Fe oxide, clay, etc., which adhere firmly to the texture is saponified by the lipases; this facilitates subsequent washing with soap-containing agents. The best temperature for applying these enzymes is 37°. The reaction is rather slow so that such soaking agents should be used only as precleaning means before the actual washing process. The action of the enzymes is selective for albumin, fat, starch, mineral oils, and ink spots. German patents for such soaking agents are mentioned and manufacturing methods are described briefly. (*Chem. Abs. 43,* 8711.)

SYNTHETIC DETERGENTS IN THE TEXTILE FIELD. Foster Dee Snell (Foster D. Snell, Inc., New York, N. Y.). *Rayon and Synthetic Textiles 30,* No. 11, 81-2, No. 12, 90-1(1949). Review of synthetic detergents and their various applications in textile processing. Detergents discussed in detail include alkyl aryl sulfonates, alkyl sulfonates, alkyl sulfates, sulphated monoglycerides, sulfated and sulfonated amides, nonionic and cationic agents.

DESOILING PROPERTIES OF CARBOXYMETHYLCELLULOSE. A. J. Feuell. *J. Textile Inst. 40,* T 523-5 (1949). Soil and wash tests with various detergents, some containing carboxymethylcellulose, on chopped cotton with standard soiling, showed that carboxymethylcellulose can enhance the desoiling power of nonionic detergents, but does not itself possess soil-removal properties, nor does it function with a simple Na ion or "builder" effect on the detergent. (*Chem. Abs. 43,* 8711.)

PREFERENTIAL WETTING OF COTTON FABRICS. Irving Reich and Foster Dee Snell (Foster D. Snell, Inc., New York, N. Y.). *Ind. Eng. Chem. 41,* 2797-2800 (1949). A technique for measuring preferential wetting of a fabric at an oil-water interface is described. It involves displacement of oils from the fibers. Sinking time to pass through the interface is measured. Preliminary results show molecularly dehydrated phosphates to be much more effective than other salts commonly used as soap and detergent builders. This effect is associated with a multivalent negative ion. Mathematical prediction that addition of synthetic detergents to molecularly dehydrated phosphates may increase sinking time is confirmed. These results correlate with unusually good detergency of the synthetic detergents on cottons when the synthetic detergents are highly built with molecularly dehydrated phosphate.

EVALUATION OF DETERGENTS FOR TEXTILE CLEANING. William P. Utermohlen, Jr. and Mary E. Ryan (Institute of Textile Technology, Charlottesville, Va.). *Ind. Eng. Chem. 41,* 2881-87(1949). A review has been made of the methods employed to measure the effects of washing procedures on soiled cotton cloth. The method of estimating absolute soil removal values by linear proportionality to the surface reflectance of the cloth, frequently employed in detergency work with carbonaceous pigments, has been shown to be incorrect when applied to cloth soiled with a black iron oxide pigment, upon which both analyses and photometric measurements can be made. Chemical measurement of amounts of analyzable pigment left on pieces of washed cloth may be used to obtain absolute soil removal values in textile detergency work.

ESTIMATION OF NONIONIC DETERGENTS. J. Oliver and C. Preston. *Nature 164,* 242-3(1949). Polyethylene glycol detergents are treated with $BaCl_2$ to remove sulfates, and with HCl and phosphomolybdic acid. The precipitate is flocculated by boiling, let stand 18 hours, filtered, washed, dried at 100°, and weighed. A comparison with known amounts of the same detergent is necessary. (*Chem. Abs. 43,* 8710.)

THE MODERN DEVELOPMENT OF SOAPLIKE AGENTS FOR TEXTILES. A. Chwala. *Mitt. chem. Forsch.-Inst. Ind. Osterr. 1,* 9-11(1946). The washing, detergent, and dispersing agents used for textiles in the industry and household are surveyed, and the general properties and field of applications of fatty alcohol sulfonates, sulfonates of fatty acid esters, fatty acid condensation products, sulfonates, hydrocarbons, ionogen-inactive materials, and cation-soaplike products, with their trade names and manufacturers, are briefly described. (*Chem. Abs. 43,* 8710.)

INTERNAL WETTING OF FIBERS AS A FACTOR IN DETERGENCY. J. Powney. *J. Textile Inst. 40,* T 519-23 (1949). One-cm. lengths of purified fibers of wool, cotton, and kapok were mounted horizontally between two vertical supports attached to the cover of a small optical glass cell, and the fiber was given an oil film by stroking with a fine glass rod dipped in liquid paraffin. The cell was then filled with detergent which at once removed a proportion of the oil but left a few strongly adherent oil drops with diameter similar to that of the fiber. The effect was studied by projection optically to 300 diameter magnification. After a time air bubbles formed within the drops, produced by ejection of air from the internal regions of the fiber at those parts of the surface covered by oil. After several hours, amount of air evolved was sufficient to increase the buoyancy of the drops so that they could be shaken off by the slightest agitation. All fibers tested showed the effect in varying degree. It is suggested that the mechanism of the effect consists of penetration of H_2O into the fiber at the clean surface on either side of the oil drops, and under these conditions the oil is incapable of penetrating the capillaries and an air lock is set up which can only release pressure by escape of air through the orifices into the oil. This effect may account for the observed practical fact that certain types of resistant soil can be removed from fabrics by prolonged soaking. (*Chem. Abs. 43,* 8687.)

SUSPENSIBILITY OF CARBON IN DETERGENT SOLUTIONS. Robert D. Vold and Christine C. Konecny. *J. Phys. & Colloid Chem. 53,* 1262-79(1949). The amounts of channel black and furnace black remaining in suspension after 4 hours were determined as a function of concentration in solutions of Aerosol OT, Oronite Active, Triton X-100, p-toluenesulfonic acid, and sodium oleate with and without added acid, base or salts. The mechanism of suspension, deduced from the above data and confirmed by the electron microscope, is deflocculation of the coarse aggregates formed in water. Consequently consideration must be given to the chemical nature of both powder and detergent for prediction of results. The colloidality of the solution appears to be important only as it affects the concentration of simple ions and molecules. Evidence is presented that the ability of a solution to suspend powders is not a satisfactory measure of its potential detergent power.

PHYSICAL PROPERTIES OF SURFACE-ACTIVE PRODUCTS. G. Reutenauer and P. Sicard. *Bull. mens. ITERG* (Inst. techn. etudes et recherches corps gras) *3,* 262-70(1949). At 18° Na and K laurates show a minimum in surface tension of about 25 dynes at concentrations of 10^{-3}, the myristates and (though less distinctly) oleates show a minimum also at 25 dynes at concentrations of 5×10^{-3}; Na and K stearates have no such minimum. Surface tension of the 2 stearates is the same as that of water at concentrations of 10^{-4}; for other soaps, at higher dilutions (about 10^{-5}). Oleates have slightly lower values than laurates. For most synthetic detergents the surface tension curve rises suddenly at given concentrations: 10^{-4} for Emulphor, between 2×10^{-4} and 5×10^{-4} for various others. For Na sulforicinoleate the surface tension curve rises smoothly and regularly. Surface tension of pure water is attained at 5×10^{-7} for all of them. Wetting powers at 18 and 60° and concentrations between 10^{-2} and 10^{-4} are compared with surface tensions. There is a rather satisfactory correlation for the soaps, but frequent contradictions occur for the synthetic products. It is concluded that surface tension has its part in wetting power but other still unknown factors intervene. (*Chem. Abs. 43,* 8711.)

PATENTS

SOAP MAKING FROM SYNTHETIC FATTY ACIDS. Arthur H. Stevens (Cargill, Inc.). *British 628,458.* Manufacture of such soaps as cold process, semi-boiled, marine, and heavy metal by treating synthetic fatty acids obtained by hydrocarbon oxidation with alkali carbonates or hydroxides is described.