☆ ☆ ☆ ABSTRACTS ☆ ☆ ☆

Oils and Fats

Edited by
M. M. PISKUR

Rancidity in Indian butterfat (ghee). K. T. Achaya. *Biochem. J. 44,* 561-7(1949). A study has been made of 3 characteristic sets of ghee (Indian butterfat), comprising about a dozen very similar samples in each, after maintenance in loosely corked bottles at temperatures between 15 and 20° over a period of 3 years. Increases in acidity exactly paralleled loss in I value for any particular batch of samples, suggesting an essentially oxidative mechanism producing free acidity in butterfat as opposed to a mainly lipolytic one in butter. The mixed free fatty acids from each batch of pooled rancid samples have been extracted thoroughly with ethanol and analyzed for component acids. Important features were: the presence of *n*-octane-1-carboxylic acid to the extent of 7-9 mol. % and of normal homologous saturated acids from butyric to *n*-nonane-1-carboxylic in roughly similar amounts; the occurrence of azelaic acid, with traces of unidentified higher and lower homologous dicarboxylic acids; the presence of about 10% of palmitic acid; the absence of any great quantity of oleic acid, but the presence of fragments of uncharacterized lower unsaturated acids in small amounts, and of non-volatile residues of low equivalent and low I value to the extent of 10-20% (accounting for nearly half of the total unsaturation).

Deacidification with solvents. G. B. Martinenghi. *Olearia 3,* 239-44(1949). This is a review principally on the system of Moreno which was published last year.

On allergy to cottonseed oil. H. S. Bernton, E. J. Coulson, and H. Stevens (Washington, D. C.). *J. Am. Med. Assoc. 140,* 869-71(1949). Two persons allergic to cottonseed gave no confirmed signs of allergy to ingested cottonseed oil. Allergy to defatted cottonseed does not seem related to allergy to edible cottonseed oil.

The effects of nordihydroguaiaretic acid, salt and temperature of storage on the stability of fat and fat-soluble vitamins in cream and butter. V. N. Krukovsky, D. A. Theokas, F. Whiting, and E. S. Guthrie (Cornell Univ., Ithaca). *J. Dairy Sci. 32,* 679-87(1949). Nordihydroguaiaretic acid (NDGA), added to milk at the rate of 0.005% of the fat, prior to pasteurization at 82.2°C. for 30 minutes and subsequent separation, was effective in preventing oxidized flavors in cream and in stabilizing the fat and fat-soluble vitamins when the cream was held 30 days at 0-1 °C. following storage for 15-247 days at -17.7 to —16.1°C. Nordihydroguaiaretic acid caused an apparent increase in the tocopherol content of winter fat from approximately 2,000 to 3,200 γ per 100 g. of fat, indicating a possibility that the antioxidant activity centered in the fat phase of the cream was largely responsible for the stabilization of cream. Depletion of the total vitamin C content of cream resulted in the prevention of the oxidized flavors for 247 plus 30 days at indicated temperatures and the fat became unstable after 30 days at 0-1°C. following storage for 40 days at sub-zero temperatures. In contrast to this, control cream containing ascorbic acid developed oxidized flavors during storage at both subzero temperatures and 0-1°C., and the fat became unstable after 20 days at 0-1°C. following storage for 15 days at sub-zero temperatures. The fat in butter containing 2% of added salt retained its stability for at least 247 days at sub-zero temperatures and then for the additional 30 days at 0-1°C.

The reaction of N-bromosuccinimide with methyl oleate and other vegetable-oil derivatives. D. A. Sutton and J. Dutta (The Paint Res. Sta., Waldegrave Road, Teddington). *J. Chem. Soc. 1949,* 939-44. *N*-Bromosuccinimide reacts with Me oleate to give an oil which can be molecularly distilled without decomposition, and contains an appreciable proportion of the dibromo substitution product. The oil reacts with chromatographic alumina; allyl bromide itself does not similarly react and 3-bromocyclohexene undergoes a vigorous decomposition. The bromosubstitution products from linoleic ester, linolenic ester, and linseed oil are unstable; they cannot be molecularly distilled without decomposition. The work has a bearing on a current hypothesis which states that the reaction between olefins and *N*-bromosuccinimide is a free-radical reaction.

An improved microscopic method of examining fatty foods. T. H. Lord and M. M. Smull (Kansas State College, Manhattan). *Food Res. 14,* 241-2(1949). A synthetic detergent makes possible the homogenization of samples on mechanically cleaned slides for the microscopic examination of butter or margarine.

Food consumption of soldiers in a subarctic climate (Fort Churchill, Manitoba, Canada). H. L. Swain, F. M. Toth, E. C. Consolazio, W. H. Fitzpatrick, D. I. Allen, and C. J. Koehn (U. S. Army, Washington, D. C.). *J. Nutr. 38,* 63-72(1949). The percentages of calories furnished by protein, fat, and carbohydrate remained almost constant, averaging 13, 41, and 46, respectively. These values are not significantly different from those reported many times for United States troops eating a garrison ration in temperate climates. There was no evidence of an increased appetite for fats in the subarctic winter.

Influence of previous diet on metabolism during fasting. S. Roberts (Univ. California, Los Angeles), and L. T. Samuels. *Am. J. Physiol. 158,* 57-62 (1949). The ability of the rat, previously force-fed a high fat diet for 6 weeks, to survive longer during fasting than similarly treated animals previously maintained on a high carbohydrate regime, appears to be related to the capacity of the former preparation to continue burning mainly fat for energy during the fasting period, thus sparing carbohydrate and protein stores.

Effect of fat in the diet of rats on their growth and their excretion of amino acids. P. B. Pearson and F. Panzer (Agr. & Mech. College of Texas, College Station). *J. Nutr. 38,* 257-65(1949). Rats fed *ad libitum* a diet with no added fat and supplemented with Et linoleate gained 29% less than rats fed diets containing 8% of corn oil or lard. There was no significant difference in the gains of rats when the intakes of protein and energy were equalized.

LIPOGENESIS FROM GLUCOSE IN THE NORMAL AND LIVERLESS ANIMAL AS STUDIED WITH C^{14}-LABELED GLUCOSE. E. J. Masoro, I. L. Chaikoff, and W. G. Dauben (Univ. California, Berkeley). *J. Biol. Chem. 179,* 1117-25 (1949). In the mouse maintained on a high carbohydrate, fat-free diet, 10-15% of the ingested glucose-C^{14} was incorporated into fatty acids in 24 hours, and 12-16% in 48 hours. In this mouse, more than 60% of the ingested glucose-C^{14} was eliminated as CO_2 in 24 and 48 hours. The specific activities of the fatty acids of liver and small intestine were much higher than that of the rest of the mouse. The finding of the highest values in the liver (3 times those of the small intestine and about 6 times those of the carcass) is interpreted to favor the liver as a primary site of synthesis of fatty acids from glucose. C^{14} was also recovered in fatty acids of the rat that had been deprived of both liver and gastrointestinal tract. C^{14}, containing palmitic acid, was isolated from eviscerated as well as normal rats that had received C^{14}-labeled glucose. The finding of an appreciable amount of C^{14} in the palmitic acid isolated from the eviscerated rat demonstrates that the conversion of carbohydrate to fatty acids proceeds significantly in tissues other than the liver and intestine.

CORRECTION OF STEATORRHEA IN BILE FISTULA DOGS BY FREQUENT RETURN OF BILE. G. W. Searle and J. H. Annegers (Northwestern Univ., Med. School, Chicago). *Proc. Soc. Exptl. Biol. Med. 71,* 277-9 (1949). The steatorrhea of 3 bile fistula dogs given a fatty meal once daily was nearly completely corrected when the animals' own bile was returned to the duodenum every hour. The steatorrhea persisted, however, when bile was returned every 4 or 8 hours. Since the total quantity of cholic acid returned during the 1- and 4-hour regimes was the same, the importance of the continuous presence of bile, apart from total daily quantity present, in the intestine is demonstrated.

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OXIDATION INHIBITION OF OILS AND FATS. Societa anon. prodotti Cano per l'Agricoltura. *Ital. 426,138* (1947). Addition is made of 0.01% Mg glycerophosphate. (*Chem. Abs. 43,* 4876).

ANTIOXIDANT FOR BUTTER. W. S. Mueller (U.S.A.). *U. S. 2,472,119.* .05% by weight of tetrachloroparabenzoquinone is used to preserve butter.

FORTIFYING GRAIN PRODUCTS. M. F. Furter and W. M. Lauter (Hoffmann-La Roche, Inc.). *U. S. 2,475,133.* A water-soluble vitamin is applied to the grain and this is coated with a saturated higher fatty acid as a plasticizer and abietic acid as an adhesive. This coat prevents the loss of the vitamin in washing and cooking.

BLEACHING GLYCERIDIC FATTY ACID ESTERS, ESPECIALLY TALLOW. E. R. Woodward (Mathieson Chem. Corp.). *U. S. 2,473,930.* The process comprises dispersing a dry mixture of chlorine dioxide and an inert gas through the fatty material while it is fluid, substantially dry, and free from mineral acidity. The fatty acid content of the fatty material must not exceed 10% by weight.

COLOR STABILIZATION OF FATTY ACIDS. A. C. Brown and V. J. Muckerheide (Emery Inds., Inc.). *U. S. 2,475,420.* Lighter colored fatty acids may be obtained by treatment with adsorbent carbon or bleaching earths immediately after distillation from fatty glycerides.

PREPARING MONOESTERS OF GLYCERINE AND FATTY ACIDS. M. H. Ittner (Colgate-Palmolive-Peet Co.). *U. S. 2,474,740.* Diglycerides or triglycerides and glycerine containing a small amount of water are placed in the upper and lower ends, respectively, of a countercurrent tower and reacted at 200-350° under a pressure high enough to keep the water a liquid. Glycerides containing more hydroxyl groups than the original glycerides are removed from the top of the reaction zone. Excess glycerine is removed from the bottom of the zone.

RUST-PREVENTING COMPOUNDS. J. I. Wasson and J. C. Zimmer (Standard Oil Development Co.). *U. S. 2,474,604.* This consists essentially of mineral oil containing 0.01-0.1% by weight of a cetyl thioether of acetic acid, 0.01-5% of polyethylene glycol hexaricinoleate.

MAKING PROTEINACEOUS AND FATTY FOODS SUCH AS MEAT, CHEESE, AND BUTTER RESISTANT TO MICROORGANISMS. G. H. Coleman and P. A. Wolf (The Dow Chem. Co.). *U. S. 2,474,228.* The method comprises incorporating in the food dehydroacetic acid or its Na, K, NH_4, and Ca salts.

STABILIZER FOR ICINGS. A. B. Steiner and L. B. Rothe (Kelco Co.). *U. S. 2,474,019.* This is an edible, water-soluble alginate together with a sorbitan ester of the higher fatty acids, and their polyoxyethylene derivative of stearic acid, and the Na sulfoacetates of the mono- and diglycerides of the higher fatty acids.

PROCESS OF MAKING QUATERNARY AMMONIUM COMPOUNDS. J. B. Rust (Montclair Res. Corp.). *U. S. 2,474,202.* The process comprises heating in the presence of an acid condensing agent, a mixture of a polyamine, a fatty acid having more than 6 C atoms and an alcohol and then adding to the tertiary aminoamide compound thus formed an alkyl halide, aralkyl halide, alkyl sulfate, or alkyl phosphate.

PLASTICIZER. L. D. Myers and J. D. Fitzpatrick (Emery Inds., Inc.). *U. S. 2,474,010.* This is the mixed ester of an aliphatic dihydric alcohol with a fatty acid and a carboxylic aliphatic nitrile.

VINYL ACETATE POLYMERS CONTAINING ESTERS OF 9,10-DIHYDROXYSTEARIC ACID AND VINYL ALCOHOL, ALLYL ALCOHOL, OR MONO-SUBSTITUTED ALLYL ALCOHOLS. D. Swern and G. B. Dickel (U.S.A.). *U. S. 2,475,557.*

Soap

Edited by
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THE COMPOSITION OF SOFTENING AGENTS. Widaly. *Seifensieder-Ztg. 72,* 55-6 (1946). *Chem. Zentr. 1947,* I, 1049. The various phosphates, Na metasilicate, and prepared oxgall are used to increase the effectiveness of most of the soda and water glass water softeners. Enzymic softening agents (Veltial PK, Tellogen, Olifan, Burnus) are likewise very satisfactory. The addition of cellulose ethers (Ca cellulose-glycolate) (I) retards the precipitation of lime and "carries" the loosened dirt. The following composition is reported for such as preparation: Na_2CO_3 40, water glass 4.5 and I 1.5%. (*Chem. Abs. 43,* 5977.)

CHANGES IN SOLUBILIZING POWER WITH CONCENTRATION FOR VARIOUS DETERGENTS. J. W. McBain and Harriette M. Huff (Stanford University, Stanford, Calif.). *J. Colloid Sci. 4,* 383-94(1949). The solubilization of dyes by a series of very different detergents has been studied over a range of concentration for each detergent. The change in solubilizing power with change in concentration is very different for different detergents. Some show a pronounced maximum at a concentration at which they have just become colloidal. Some show maxima and minima or other change with concentration. Therefore it follows that the micelles or colloidal particles in any one concentration of a detergent differ from those in other concentrations of the same detergent. There must be an equilibrium between different kinds of micelles present in the same solution, changing with concentration and other factors.

EMULSIFICATION AND DETERGENCY. F. Courtney-Harwood. *Chem. Products 12,* 162-6(1949). A discussion of the problem of removing dirt from contaminated surfaces, practical detergency, surface wetting, mechanism of detergent action, surface and interfacial tension, penetration of solution, suspending power, application of research to practice, synthetic detergents, and hospital tests. (*Chem. Abs. 43,* 5975.)

SURFACE FILMS OF SOLUBLE DETERGENTS. A. P. Brady (Stanford Research Institute, Stanford, Calif.). *J. Colloid Sci. 4,* 417-24(1949). The force-area diagrams for films of a number of water-soluble detergents were determined by using salts in the substrate to reduce solubility, and by employing rapid compression. Curves were obtained with films of some pyridinium salts, Aerosol OT, sodium lauryl sulfonate, and the C_{14} to C_{18} derivatives of sodium alkyl sulfates. A comparison of the results of this investigation on undissolved films with results below the critical concentration on solutions of detergents and soaps indicates that the films are not the same under the two conditions. Surface tension and microtome measurements show that, at a given "surface pressure" films on solutions occupy about twice the area of films on a salt substrate. Above the critical concentration, present measurements agree well with microtome results on solutions, but again not with surface tension results.

SODA ASH AS A SOAP BUILDER. Andrew Treffler. *Soap Sanit. Chemicals 25,* No. 8, 25-7, 137 (1949). Soda ash is very useful as a soap builder due to its ability to bind water as water of crystallization, removing water from the soap. However, at high temperatures the crystalline soda ash shows signs of deliquescence and the soap products containing it are too moist for easy processing. Means of overcoming this problem are discussed.

DETERGENTS AND DETERGENCY. Foster Dee Snell (Foster D. Snell, Inc., New York, N. Y.). *Chem. Eng. News 27,* 2256-62, 2301(1949). Extensive review article covering fundamentals of detergent structure and types of detergents; information on various soils and the forces holding soil in place; measurement of detergency; discussion of such physical-chemical properties as surface tension, interfacial tension, dispersing power, solubility in micelles, and sorption of detergents on surface to be cleaned; and detergent builders. 42 references.

CHARACTERIZATION OF ALKALI SOAPS BY ELECTRON MICROSCOPY. Gopal S. Hattiangdi and Max Swerdlow (National Bureau of Standards, Washington, D.C.). *J. Research Nat. Bur. Standards 42,* 343-60(1949). The morphological differences between several closely related alkali soaps have been determined by the techniques of electron microscopy. The crystalline alkali soaps consist of an interlocked mesh of bundled fibers, whereas the liquid-crystalline soaps exhibit a flagellar and/or featureless phase. The micellar groupings for the individual soaps are unique, and a scheme based upon the electron micrographs is suggested for their characterization. The structures of Li, Na, and K palmitates are closely related. The laurate, palmitate, and stearate of Na also exhibit homologous structures. The results of the morphological investigations offer a rapid and accurate means of identification and have been successfully applied to the problem of characterizing commercial soaps of unknown composition.

CHEMICAL REQUIREMENTS OF THE LAUNDRY INDUSTRY. Richard B. Mitchell (American Institute of Laundering, Joliet, Ill.). *Chem. Ind. 65,* 220, 222, 224, 226, 297(1949). The uses and amounts used of such laundry chemicals as soaps, detergents, bleach, scours, blues, starches, and miscellaneous compounds are given.

DETERGENCY STUDIES. IV. INFLUENCE OF OILY SOIL UPON THE REMOVAL OF PIGMENT SOIL. William P. Utermohlen, Jr., Earl K. Fischer, Mary E. Ryan, and Gordon H. Campbell (Institute of Textile Technology, Charlottesville, Virginia). *Textile Research J. 19,* 489-96(1949). Natural soils on textiles usually contain both oily and solid components, and the generally accepted mechanism of soil removal postulates the emulsification and suspension of oil droplets or of solid particles covered with an intact oil film. Thus the ready removal of solid soil has been considered as dependent upon the presence of an emulsifiable oily soil, which had also served, prior to washing, to bind the solid soil more tightly to the fabric. Washing tests have been made on samples of cotton cloth soiled to the same extent with lampblack or iron oxide in the presence of an oily liquid binder, of non-oily, water-soluble liquid binders, and of no binder at all. The ease of removal of the pigments was equal or only slightly different in all of these cases, indicating the removal of solid soil and of oily soil are separate phenomena and not interrelated to any great extent. This result indicates the desirability of reconsidering the theory of soil removal, and a possible improvement and simplification of laboratory test methods for detergent action.

ESTIMATION OF SOAPS AND IONIZED DETERGENTS. M. R. J. Salton and A. E. Alexander. *Research (London) 2,* 247-8(1949). Pinacyanol bromide is an excellent indicator for use in titrating anionic with cationic soaps, the method used for analyzing these modern soaps and detergents. Mixtures such as cetyltrimethylammonium bromide with Na cetyl sulfate, Na dodecyl sulfate, or Aerosol OT can be titrated very readily even in 0.001 *N* solution (no clear end point was obtained with Aerosol M.A.). The speed and accuracy (1%) of titrating with this indicator are very attractive. (*Chem. Abs. 43*, 5976.)

AN IMPROVED TECHNIQUE FOR MEASUREMENT OF THE DISPERSING POWERS OF DETERGENTS. Foster D. Snell and Irving Reich. *J. Soc. Chem. Ind. (London) 68*, 98-100 (1949). A lightly oiled umber soil was agitated with detergent solution and permitted to stand in a Nessler tube for 2 hours. A sample of the suspension was pipetted off and the turbidity determined in a modified electric turbidimeter. Results were expressed as reciprocal of the length needed to just obscure the filament × 100. (*Chem. Abs. 43*, 6436.)

THE PRODUCTION OF MOLDED OR CAKE DETERGENTS. H. Manneck. *Seifensieder-Ztg. 72*, 176-8(1946); *73*, 2-3(1947); *Chem. Zentr. 1947*, I, 1243-4. A review of the possible methods of producing cake detergents by using as a base such materials as kalunite, cyclanone, lauric alcohol, sulfates, Igepon, etc., together with cellulose ethers, filler (as kaolin, clay, etc.), and crystalline salts. (*Chem. Abs. 43*, 6436.)

SYNTHETIC DETERGENTS—UP TO DATE. John W. McCutcheon. *Soap Sanit. Chemicals 25*, No. 8, 33-45 (1949). A review of the history, types, and methods of production of the various classes of synthetics; their future outlook and a revised and expanded list of over 700 trade name products giving the trade name, manufacturer, class and formulas, use, form, % concentration, and other miscellaneous information.

THE COMPOSITION OF WASHING POWDERS. Widaly. *Seifensieder-Ztg. 72*, 75-7(1946); *Chem. Zentr. 1947*, I, 1049. In addition to the alkalies (soda, water glass) and buffers (bicarbonate) the most effective admixtures to washing powders are the di- and tri-sodium phosphates and the pyro- and metaphosphates. Trilone A and B (Na salts of nitriloacetic acid and ethylenediaminetetramethylcarboxylic acid) are added as softening agents to washing powders used directly in laundries. Tylose HBR is Na celluloseglycolate in flake form; it contains about 30% water. It is a valuable admixture to fat-free detergents and to detergents containing mersolates, aliphatic alcohols, sulfonates, and condensation products of fat acids. (*Chem. Abs. 43*, 5977.)

DETERGENTS AND THEIR COMPOSITION. Kurt Lindner. *Seifensieder-Ztg. 72*, 174-6(1946); *Chem. Zentr. 1947*, I, 1244. The 3-5% fat acids often present as soaps in washing powders and other detergent preparations react with hard water to form Ca and Mg soaps. For this reason the use of Mersol (paraffin sulfochloride), which does not form insoluble Ca and Mg compounds, is preferable in such preparations. The new surface-active agents, Mersolate and Supralan (Na salt of an alkyl naphthalenesulfonic acid), lack sufficient "soil-carrying" capacity. Therefore protective colloids such as Tylose HB and HBR are added to hold the loosened soil in suspension, although they themselves possess no surface activity. Other surface-active substances discussed include fatty alcohol sulfonates such as Gardinol and Texapon, fatty acid condensation products, and alkyl naphthalenesulfonates. Other admixtures include protein and gall products, wood polyoses, lignin substances, and sulfite liquor. In addition to cellulose ethers, various gums and pectins act as protective colloids and are suitable for use in combination with the above substances. (*Chem. Abs. 43*, 6436.)

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WASHING AGENTS. Oel- & Chemi-Werk A. G. *Swiss 252,999*. Beside the improvement due to the use of water-soluble cellulose ethers in soaps, addition of the by-products from a reaction of alkali cellulose with monochloroacetic acid or its salts improves the detergent properties of the soaps still further. (*Chem. Abs. 43*, 5978.)

CONTINUOUS MANUFACTURE OF SOAP. Ronald Vincent Owen (Joseph Crosfield & Sons, Ltd.). *British 623,224*. The method of continuously separating nigre and molten neat soap from molten fitted soap comprises forming a continuous, substantially quiescent stream of molten fitted soap so as to allow the nigre to separate out by gravity and withdrawing settled neat soap.

IMPROVEMENTS RELATING TO WETTING, FOAMING, DETERGENT, AND EMULSIFYING AGENTS. Harold Adams (G. H. Briggs, Ltd.). *British 621,618*. A useful wetting agent and detergent is prepared by mixing chlorosulphonic acid with urea and treating this reaction product with an aliphatic alcohol containing from 10 to 18 carbon atoms.

AMIDE DERIVATIVE. Ciba, Ltd. *Swiss 246,668*. A new amide derivative useful as a washing agent for textiles is prepared by treating technical stearamide 1 with crotonaldehyde 1, and $NaHSO_3$ 2 mols. in a solvent and in the presence of a secondary amine. A mixture of technical stearamide 5.6 and formylmorpholine 15 parts is stirred and heated at 110-20° until a clear solution is obtained. The mixture is cooled to 90-5° and treated first with crotonaldehyde 1.7 and then with finely powdered and dried $NaHSO_3$ 5 parts. The temperature is raised to 130-40° for 4 hours, and the mixture is allowed to cool somewhat and is then treated with 50 parts abs. EtOH. After short heating and cooling, the product is filtered and recrystallized from 80% EtOH. (*Chem. Abs. 43*, 5978.)

Drying Oils

Edited by
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TALL OIL AND ITS UTILIZATION. A. Pollak. *Chemurgic Digest 8*, No. 6, 8-10(1949).

ALKYD RESIN TECHNOLOGY. E. M. Beavers (The Rohm and Haas Co., Philadelphia, Pa.). *Am. Paint J. 33*, No. 29, 38, 42, 44-5(1949).

ON THE VISCOSITY MEASUREMENT OF STAND OIL. J. D. von Mikusch. *Farbe u. Lack 55*, No. 7, 241-7 (1949). A bubble viscometer similar to the Gardner tubes is described in which the viscosity in poises is equal to the seconds required for the bubble to rise through the tube. It is shown that the time of rise is not independent of liquid density and an equation is given for making the density correction.

EFFECT OF CONJUGATION OF ISOLATED DOUBLE BONDS ON THE DESICCATION OF VEGETABLE AND MARINE OILS. Anon. *Chem. Abzor 24*, 18-20(1949). Conjugation of the double bonds of linseed oil up to 50% at 180-200° with Ni catalyst containing S, for 15-45 minutes, gives a product similar to tung oil for paint and lacquer manufacture. Further conjugation is not desirable. (*Chem. Abs. 43,* 5609.)

REFINING AND PAINT APPLICATION OF TALL OIL. B. F. H. Scheifele. *Farbe u. Lack 55,* 105-6(1949).

HARDENING OF TUNG OIL BY ANHYDROUS FERRIC CHLORIDE SOLUTION. P. E. Demmler. *Natl. Research Council, Div. Eng. and Ind. Research, Ann. Rept. Conf. on Elec. Insulation 1948,* 58-60(1949). Anhydrous $FeCl_3$ dissolved in tritolyl phosphate with castor oil added to retard gelation is thoroughly mixed with tung oil (0.8% $FeCl_3$). Gelling occurs in 1.5 minutes at 50° or 60 minutes at 25°. The electrical insulation value of the gel increases to a near maximum in 48 days at 25° or in 6 hours at 70-80° although insulation resistance doubles for each 10° decrease in aging temperature. (*Chem. Abs. 43,* 5605.)

THE GELATION OF TUNG OIL. XVIII. EFFECT OF VARIOUS SARDINE OILS. M. Tachimori and K. Ito. *J. Soc. Chem. Ind. Japan 43,* 825-7(1942). The gelation tendency of mixtures of raw or concentrated sardine oils and tung oil is greater than that of perilla oil. XIX. EFFECT OF MALEIC ANHYDRIDE AND GLYCEROL. *Ibid.* 827-8. Maleic anhydride or glycerol prevented the gelation of tung oil but a mixture of the two accelerated gelation. XX. DEGREE OF POLYMERIZATION WHEN TEMPERATURE INCREASES LINEARLY WITH TIME. *Ibid 47,* 484-6(1944). The ratio of the times required to reach equal amounts of thermal polymerization by heating at a constant rate of temperature increase and by heating at a constant temperature equal to the top temperature reached during the temperature increase is calculated by a formula. XXI. DEGREE OF POLYMERIZATION WHEN TEMPERATURE CHANGES EXPONENTICALLY WITH TIME. M. Tachimori. *Ibid.* 598-601. Constants were determined for two formulas for calculating the degree of polymerization reached during heating at an exponential rate of temperature increase. (*Chem. Abs. 43,* 5204.)

THERMALLY FORMED OIL FILMS. J. Scheiber. *Farben u. Lacke 55,* 35-40(1949). Chinawood oil films probably dry by a diene condensation catalyzed by peroxides in the oil at all temperatures while linseed oil films follow this mechanism above 130° and dry by peroxidation below 100°. Heating of dry films of the former at 160° causes brittleness and loss of adhesion while linseed oil films were not affected except for some discoloration. Drying times for each type of film at various temperatures and change in weight of the dry films at several temperatures are given. (*Chem. Abs. 43,* 5203.)

OIL OF VEGETABLES GROWN IN THE SOUTHERN AREAS. VI. OIL OF CANDLENUT PRODUCED IN CELEBES. H. Nobori and H. Akabane. *J. Soc. Chem. Ind. Japan 46,* 899-901(1943). Oil of good drying properties was obtained in 66.2% yield by ether extraction of seeds of *Aleurites moluccana.* The fatty acid composition was 6.7% saturated, 45.5% oleic, 33.0% linoleic, and 14.9% linolenic. (*Chem. Abs. 43,* 5203.)

FATTY OILS AS RAW MATERIALS FOR COATINGS. E. Karsten. *Farben, u. Lacke, Anstrichstoffe 3,* 29-35 1949). The composition, properties, the mechanisms of drying, heat-bodying, and blowing, and the properties of certain processed drying oil are discussed. (*Chem. Abs. 43,* 5202.)

POLYMERIZATION OF DRYING OILS. J. C. Cowan *et al.* (Northern Regional Research Laboratory, Peoria, Ill.). *Ind. Eng. Chem. 41,* 1647-53(1949). Dimeric fat esters obtained from the polymerization of methyl esters of soybean and linseed acids under various conditions of temperature and catalyst were analyzed for dimer and trimer by molecular distillation. The highest ratios of dimer to trimer were obtained at 300° with anthraquinone or with no catalyst while BF_3 and SO_2 catalysts produced the largest overall yields. Accurate I values of the polymerized esters could not be obtained by any of several methods. Polyesters, polyesteramides, and polyamides prepared from the esters by reaction with various glycols, glycol amines, and polyamines, and polyesters cross-linked with diisocyanates were compounded and vulcanized to give rubberlike products. Tensile products of these elastomers improved as the dimer-trimer ratio increased, as the length of the glycol chain was increased, and as the molecular weight of the polyester increased. Cured elastomers from polyamides were more brittle than those from the polyesters. Polyesters added to lubricating oils increased the viscosity index in relation to the molecular weight of the polyester.

DRYING OILS AND RESINS. H. Dannenberg, T. F. Bradley, and T. W. Evans (Shell Development Co., Emeryville, Calif.). *Ind. Eng. Chem. 41,* 1709-11 (1949). The preparation of polyesters from glycerol α-allyl ether ($CH_2{=}CH{-}CH_2{-}O{-}CH_2{-}CH{-}OH{-}CH_2OH$) and phthalic anhydride, succinic, adipic, diglycolic, and alkenyl-succinic acids or their methyl esters is described and their structural similarity to alkyd resins is discussed. The polyester solutions are generally compatible with aromatic hydrocarbons but not with aliphatics. The films may be air-dried or baked and conventional driers may be used although an excess causes wrinkling. Films from the succinate were unusually hard and resistant to abrasion and to chemical agents while those prepared from phthalic anhydride were greatly superior to alkyds in alkali resistance and when baked as enamels had superior heat stability. The succinate and phthalate have generally low compatability with other coating materials.

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PROTECTIVE COATING COMPOSITIONS AND METHODS FOR PRODUCING SAME. J. C. Cowan and H. M. Teeter (Northern Regional Research Laboratory, Peoria, Ill.). *U. S. 2,477,116.* A spirit varnish is prepared by dissolving a zinc salt of polymeric fat acids in a volatile organic solvent in the presence of an organic amine.

WAX-POLYAMIDE-PINENE RESIN COATING COMPOSITION. K. W. Fries (Rhinelander Paper Co., Rhinelander, Wis.). *U. S. 2,469,108.* The composition includes 80-98% of a plasticized ethylene diamine polyamide derived from polymerized linoleic and linolenic acids.

MODIFIED STYRENE-LINSEED OIL INTERPOLYMERS. A. E. Young and H. M. Hoogsteen (Dow Chemical Co., Midland, Mich.). *U. S. 2,468,798.* One part of linseed oil is reacted with 0.5-1.2 parts of a mixture principally of styrene with some α-alkylated styrene, and with 2-4% of divinylbenzene at 100-200°. The reaction is carried out in 20-60% of inert solvent until 80% of the alkenyl aromatic compounds are reacted.

INTERPOLYMER OF MONOVINYL AROMATIC COMPOUND, MONOCARBOXYLIC OLEFINIC ACID AND DRYING OIL OR ACID. E. G. Bobalek (The Arco Co., Cleveland, Ohio). *U. S. 2,470,757.* An ungelled resinous polymer is produced from 10-60% of a monovinyl aromatic compound, 2-25% by weight of the vinyl compound of a 2-5 C monocarboxylic olefinic acid, and the balance being drying oils or their acids having a double bond content between 133 and 274 as determined by the Woburn I number.

INTERPOLYMERS OF DRYING OILS, MONO-ALKENYL-AROMATIC HYDROCARBONS AND DIVINYLBENZENE. G. A. Griess and A. S. Teot (Dow Chemical Co., Midland, Mich.). *U. S. 2,468,747.* A clear varnish resin is prepared by interpolymerizing a drying oil having less than 35% conjugation, 30-60% of a mono-alkenyl-aromatic material comprising mostly styrene, and 0.5-5% of divinylbenzene at 100-200° until at least 80% of the alkenyl-aromatic compounds are reacted.

DRYING OIL-STYRENE INTERPOLYMERS. G. A. Griess and A. S. Teot (Dow Chemical Co., Midland, Mich.). *U. S. 2,468,748.* A drying oil of less than 35% conjugation is reacted with 10-70 parts of a mixture of styrene and α-methyl styrene at 120-300° to form a varnish resin.

INTERPOLYMER PRODUCED FROM POLYHYDRIC ALCOHOL, POLYBASIC ACID AND INTERPOLYMER OF MONOVINYL-AROMATIC COMPOUND, OLEFINIC ACID, AND DRYING OIL OR OIL FATTY ACID. E. G. Bobalek (The Arco Co., Cleveland, Ohio). *U. S. 2,470,752.* The resinous polymer described in *U. S. 2,470,757* is reacted in the amount of 30-80% with a polyhydric alcohol, and a polybasic acid, the ratio of hydroxyl to carboxyl groups being between 1.1 and 2 to 1 and the acid number or the product being less than 40.

CONDENSATION PRODUCTS OF LAC. B. S. Gidvani and Indian Lac Cess Committee. *Brit. 573,826.* The etherified product from reacting lac at above its melting point with an excess of ethylene glycol and then removing excess glycol is esterified with resin acid or non-conjugated drying-oil acids to form esters useful in varnishes. (*Chem. Abs. 43,* 4030.)

UNCOOKED WRINKLE COMPOSITION CONTAINING SYNTHETIC RUBBER AND CONJUGATED DOUBLE BOND OIL. E. L. Luaces (New Wrinkle Inc., Wilmington, Del.). *U. S. 2,468,989.* The composition comprises 100 parts of a conjugated drying oil, 10-50 parts of a butadiene copolymer rubber, and an organic solvent.