Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

Reciprocal action of bilirubin and unsaturated fat acids. M. M. Yenson (Univ. Istanbul). *Tib Fakultesi Mecmuasi 7,* 4028-32 (1944). In the system bilirubin plus multiple unsaturated fat acids, besides the autoxidation of the fat acid (or linseed oil) in air at 38° there occurred a conversion of bilirubin into biliverdin and finally into a colorless substance. At the same time bilirubin decreased the autoxidation. Photometric measurement of the bilirubin-linseed oil system showed that within 64 hrs. 90-95% of the bilirubin was destroyed. The degree of autoxidation was estimated by the gain in weight of the mixture. (*Chem. Abs. 40,* 5782-3.)

Lipotropic action of lipocaic: A study of the effect of oral and parenteral lipocaic and oral inositol on the dietary fatty liver of the white rat. M. L. Eilert and L. R. Dragstedt (Univ. Chicago). *Am. J. Physiol. 147,* 346-51 (1946). Inositol in doses of 164 mg. per day fails to prevent marked deposition of fat in the liver of the white rat fed a high fat, low protein diet containing 5% brewer's yeast. Defatted alcoholic extracts of beef pancreas containing lipocaic exert a marked lipotropic effect when fed in the same dose. Inositol is thus not the active principle in beef pancreas which prevents this type of dietary fatty liver in rats. Pancreatic extracts sterilized by Berkefeld filtration exert just as marked a lipotropic effect when given by subcutaneous injection as when fed.

Action of choline and fat on the formation of phospholipides in the intestine. C. Artom and W. E. Cornatzer (Bowman Gray School Med., Wake Forest College, Winston-Salem, N. C.). J. Biol. Chem. *165, 393-4 (1946).* Previous studies have shown that lipide phosphorylation in the small intestine is more active when fat is ingested. The present data indicate that both choline and fat are involved, a finding which may be of interest in relation to a possible role of lipide phosphorylation in the absorption of fat from the intestine. It appears that when single large doses of choline and fat with radioactive P are given simultaneously there is a considerable increase in both the total radioactivity and the specific activity of the intestinal phospholipides. Choline alone also stimulates the phosphorylation of lipides in the intestine, but to a lesser extent than when choline and fat are ingested. In rats on the choline-deficient diet, the administration of oil alone does not affect the total radioactivity or the specific activity values. This finding, in conjunction with the results obtained from rats on the stock diet, suggests that the supply of choline (or choline precursors) may represent a limiting factor for the formation of phospholipides during the absorption of fat from the intestine.

The effect of feeding cholesterol without fat on the plasma-lipids of the rabbit. The role of cholesterol in fat metabolism. G. Popjak (St. Thomas's Hospital Med. School, London). *Biochem. J. 40,* 608-21 (1946). Amorphous cholesterol fed in a watery suspension is well absorbed by rabbits and causes a rise in the free and esterified cholesterol, phospholipids and neutral fats of the plasma 24 hr. after the ingestion. During prolonged cholesterol feeding all plasma-lipids show a progressive increase. The advantages of feeding amorphous cholesterol without added fat are (a) that the effects of cholesterol alone can be studied, and (b) that induced lipemia develops more rapidly and reaches higher levels than with the customary high fat cholesterol diets. The fat reserves of the cholesterol-fed animals became depleted in 3-12 weeks in spite of an undiminished food intake. The concentration of neutral fat was higher in the lymph than in the plasma of cholesterol-fed rabbits, indicating an increased mobilization of depot fat. The I values of phospholipid fatty acids of the plasma decreased during cholesterol feeding, nearly reaching those of the rabbits' adipose tissue; on the other hand, the I values of the non-phospholipid fatty acids increased. It is suggested that the fatty acids of plasma-lipids during cholesterol administration were derived from mobilized depot fat. Quantitative relationships were found between plasma free cholesterol and phospholipids on the one hand, and non-phospholipid fatty acids on the other. It is inferred that plasma free cholesterol acts as a regulator of plasma-lipid levels by determining the rate of mobilization of fat from the depots, and the synthesis of plasma-phospholipids. Cholesteryl esters may play a part in fatty acid oxidation. A hypothesis is advanced which seeks to explain the different plasma-lipid levels in the various species by a single factor, *i.e.* by the different amounts of acetate available for cholesterol synthesis.

PATENTS

Decolorizing oils. F. M. Sullivan. *U. S. 2,408,454.* The method of bleaching oils comprises intimately contacting the oil with preformed hydrous alkali metal soaps separable from the oil, the soaps being formed from saturated and unsaturated fat acids containing at least 25% of saturated and at least 30% of unsaturated acids, the soaps being dispersed through the oil in finely divided condition, and separating the soap carrying the color bodies from the treated oil.

Plant extracts and method of producing same. O. Gisvold (Regents of the Univ. of Minnesota). *U. S. 2,408,924.* Nordihydroguaiaretic acid (N.D.G.A.) is separated from concentrates in ether solution by adding chlorinated hydrocarbon solvent, evaporating the solvents until solution is the consistency of syrup, crystallizing the N.D.G.A., and washing impurities from the crystals with chlorinated hydrocarbon solvent.

Color stabilization. H. C. Black (Industrial Patents Corp.). *U. S. 2,408,904-5*). The tendency of discoloration in the use of gum guaiac as an antioxidant is reduced in the presence of an acid such as acetic acid.

Derivatives of isoascorbic acid. P. A. Wells and D. Swern (Sec. Agr.). *U. S. 2,408,182.* The method of producing fatty acid esters of *d*-isoascorbic acid containing an unsubstituted ene-diol group comprises reacting Ca 2-ketogluconate with a saturated fatty acid.

EMULSIFYING AGENTS PRODUCED FROM GLYCOL GLUCOSIDES. W. C. Griffin (Atlas Powder Co.). *U. S. 2,407,003.* The emulsifying agent is produced by the reaction of 4.5 mols. of the oleic acid on the product of the reaction of 6 mols. of ethylene oxide and one mol. of propylene glycol glucoside from glucose. The product gives a water absorption value of the order of 2500.

MANUFACTURE OF CREAM SUBSTITUTES. R. D. Mason and A. C. Justesen. *U. S. 2,407,027.* The method of making a whippable cream substitute comprises the steps of preparing an aqueous serum containing soybean flour, an ionizable salt of a tribasic acid and gum karaya, preparing a fat base consisting of hardened peanut oil, injecting the fat base in fine jets into the serum under pressure of the order of 200 kg. per square cm., and pasteurizing and homogenizing the emulsion thereby produced.

SEPARATING CHLOROPHYLL FROM VITAMINS AND OTHER FAT SOLUBLE MATERIALS. W. R. Graham, G. O. Kohler, and R. D. Hoover (American Dairies, Inc.). *U. S. 2,408,625.* The separation of fat soluble vitamins and pro-vitamins from chlorophyll in a fat solvent extract of plant materials is accomplished by dialyzation utilizing a membrane of rubber or synthetic rubber.

FLAME RESISTANT AND WATER REPELLENT FABRICS. J. L. Kurlychek (U. S. Rubber Co.). *U. S. 2,406,779.* An asbestos fabric contains an appreciable quantity of inflammable fibers, and which is rendered flame resistant and water repellent but not impervious to the air and not appreciably heavier or stiffer by a flame-resistant, inorganic oxide deposited upon the fibers of the fabric and held in place by a compatible deposit of Zn soap of cocoanut oil acids fused to the fibers in such a way that the treated fabric will not generate obnoxious fumes under relatively high temperatures.

DEFOAMER. L. T. Monson (Petrolite Corp., Ltd.). *U. S. 2,408,527.* The process for destroying or reducing foam is characterized by subjecting a foaming composition to the action of a reagent comprising a basic fat acid polyaminoalcohol.

PROCESS OF SEPARATING TALL OIL INTO FRACTIONS BY TREATMENT WITH LEVULINIC ACID ESTER. K. D. Longley (Quaker Chem. Products Corp.). *U. S. 2,409,137.* When tall oil is mixed with a levulinic acid ester an apparently homogeneous solution is first obtained, and then after a few minutes at room temperature a wax solid separates which has a very low acid number and consists largely of sterols. After separation of the sterols from the liquid and on cooling the liquid to, for example, —30°F., pale yellow crystals separated from the liquid. This crystalline material is predominantly fatty acids and the remaining liquid consists mostly of rosin acids.

INSTANTANEOUS RECORDING COMPOSITION. A. B. Savage (Dow Chemical Co.). *U. S. 2,407,179.* The record is made of Et cellulose plasticized with an alkyl ester of ricinoleic acid.

PLASTICIZERS AND EMULSIFIERS. W. C. Griffin (Atlas Powder Co.). *U. S. 2,407,002.* First react sugar and a glycol, or glycol ether, in the presence of a strong mineral acid catalyst under conditions preventing loss of volatile reactants and reaction products from the reaction mixture. The second step consists in continuing the reaction under conditions permitting, or promoting, the removal of volatile materials from the reaction mixture. The reaction of the second step is continued until a new equilibrium is substantially reached.

INSECTICIDE. B. H. Thurman (Benjamin Clayton). *U. S. 2,407,041.* Cottonseed oil phosphatides are used as spreaders for insecticide solutions containing stomach poisons.

ESTERS OF FAT ACIDS AND OLEFINIC HYDROCARBONS. J. E. Mahan (Phillips Petroleum Co.). *U. S. 2,408,940.* A process for the production of an olefinic ester of a fat acid comprises reacting the olefin and the nitrile of the fat acid in the presence of aqueous sulfuric acid and at a temperature of 40-100° under pressure sufficient to maintain liquid phase.

Abstracts

Drying Oils

Edited by
HOWARD M. TEETER

OXIDATION OF ETHYL LINOLEATE. M. Carrière and A. Pellero (Univ. Marseilles). *Bull. matières grasses, inst. colonial Marseille 30,* 18-22 (1946). On oxidation in air of a layer of Et linoleate the time during which peroxides attain their maximum is shortened with increasing temperature; and the time is also shortened and the magnitude of the maximum is increased with a diminishing layer thickness. The relations of both I No. and *n* with time are linear after the period corresponding to that at which peroxides attain their maximum. The preparation of Et linoleate from a fat is described. (*Chem. Abs. 40,* 6324.)

THE ACTION OF COPPER AND ANTIOXIDANTS IN LINOLEIC ACID OXIDATION. F. G. Smith and E. Stotz (Geneva, N. Y.). *N. Y. (Geneva) Agr. Exp. Sta., Tech. Bull. 276,* 30 pp. (1946). The effects of Cu and several types of antioxidants on linoleic acid autoxidations were studied by measuring the rate of O_2 uptake of aqueous suspensions in the Warburg apparatus. Cu was the controlling factor in autoxidation rate under the conditions of the experiment. The effect of Cu-complex forming substances varied with the concentration of Cu and the time of addition. Hydroquinone appeared to function by a different mechanism than did the Cu inhibitors. Comparison of the stability of 8-hydroxyquinoline and Na 2,6-dichlorobenzenoneindophenol during linoleic acid autoxidation provided further evidence of differences in action of Cu inhibitors and oxidizable antioxidants. (*Chem. Abs. 40,* 6325.)

POLYMERIZATION OF DRYING OILS: RUBBERLIKE PRODUCT FROM VEGETABLE OILS. J. C. Cowan, W. C. Ault, and H. M. Teeter (Northern Regional Research Labs., Peoria). *Ind. Eng. Chem. 38,* 1138-44 (1946). Thermal polymerization of fatty acids from vegetable oils high in linoleic acid produces largely dibasic acids. Esterification of these acids with ethylene glycol produces long-chain polymers which may be compounded and cured in the same manner as natural rubber to produce vulcanizates superior to factice. Soybean fatty acids can be used to produce vulcanizates of up to 900 lb./sq. in. tensile strength and 150% elongation while linseed and tall oil fatty acids are slightly inferior in this respect. This inferiority is explained by the fact that a lower degree of molecular linearity is obtained in the polyester reaction when using polymerized linseed fatty acids because of the high concentration of trimeric fatty acids present. The vulcanizates are characterized by good resistance to oxidation and fair resistance to abrasion. They are suitable for the manufacture of washers, grommets, sponge rubber and adhesives and can be calendered onto cloth.

Catalytic isomerization of vegetable oils: Nickel catalyst. S. B. Radlove (Maytag Co., Newton, Iowa), H. M. Teeter, W. H. Bond, J. C. Cowan, and J. P. Kass, *Ind. Eng. Chem. 38,* 997-1002 (1946). Neutral isomerization of the double bonds in vegetable oils to produce conjugation may be effected by certain catalysts. The most effective catalyst found, reduced Ni on activated C, produces a fast-drying soybean oil when heated with the oil under optimum conditions in an inert atmosphere. Spectrophotometric measurements indicate that 30-34% conjugation may be produced in an alkali-refined soybean or linseed oil. The catalyst is less effective when used with crude oils and the efficiency of the catalyst decreases with reuse. Methods for preparing the catalyst and treating the oil are described.

Catalytic isomerization of vegetable oils: Evaluation of oils in bodying, varnishes, and alkyd resins. L. B. Falkenburg, A. W. Schwab, J. C. Cowan, and H. M. Teeter. *Ind. Eng. Chem., 38,* 1002-09 (1946). Ni-C isomerized linseed or soybean oil polymerized considerably faster than the alkali-refined oil from which it is made. This rapid bodying produced oils of lower acid number and lighter color, and loss in weight during bodying is less. In varnish formulations, dehydrated castor oil varnishes were found to be generally faster air drying and more alkali- and water-resistant than those prepared from isomerized oils. Special formulations for isomerized oil varnishes might overcome this inferiority. Isomerized oil alkyds polymerized more rapidly and air dried more slowly than their non-isomerized counterparts and had inferior water resistance but superior alkali resistance. An isomerized soybean oil alkyd compared very favorably with a dehydrated castor oil alkyd except in water resistance.

Ethanolysis of heat-polymerized linseed oil. J. Petit. *Compt. rend. 220,* 829-30 (1945). Heat-polymerized linseed oil was re-esterified with ethanol and the product was distilled. A distillable fraction was analogous to Et esters of linseed fat acids: and a non-distillable fraction, comprising up to 65% of the total esters had the properties of a dimer. It could be converted to hydrocarbons by reduction to tertiary alcohols with Et MgBr followed by dehydration. No residue was left upon distillation of these hydrocarbons which had a molecular weight of 607. It is concluded that heat-polymerization of linseed oil is a dimerization process. (*Chem. Abs. 40,* 6837.)

Investigations on the heat-treatment of linseed oil and the formation of stand oil. J. Petit. *Peintures, pigments, vernis, 22,* 3-14, 41-9, 73-80, 118-24 (1946). It is concluded that during bodying of linseed oil its linoleic and linolenic radicals dimerize, thus forming a network of connected glycerides. The dimerization is probably preceded by migration of double bonds to conjugated positions; two acid groups form a 6-ring which (at least partly) turns aromatic by double-bond shifts. The network also includes free COOH groups by reaction of free acid and glyceride. A very detailed review of the literature is made. (*Chem. Abs. 40,* 6838-41.)

The mechanism of stand oil formation. J. Petit. *Peintures, pigments, vernis, 20,* 2-11 (1944). A review of the theories of Salway, Fahrion, Wolff, Paleni, Rossmann, Kurz, Kappelmeier, and Bradley and Johnston. (*Chem. Abs.* 40, 6841.)

The protective action of lead compounds. J. E. D. Mayne (Cambridge Univ.). *J. Soc. Chem. Ind. 65,* 196-204 (1946). Distilled water is rendered non-corrosive by Pb powder, litharge and red Pb, but not by PbO_2, $PbSO_4$, $PbCrO_4$, $PbSO_4 \cdot PbO$, $PbCO_3 \cdot Pb(OH)_2$, FeO or TiO. Paint films made with a Pb pigment basic enough to form soaps renders water non-corrosive, presumably by hydrolysis of the soaps to give soluble lead compounds. A paint utilizing this property should contain enough free acid to form soaps and should be highly water-resistant to prevent too rapid removal of the soluble inhibitive ingredients. The mechanism by which the products of hydrolysis of Pb linoleate cause inhibition has been examined, and it is concluded that the soluble lead compounds are adsorbed on the bare metal and act as anodic adsorption inhibitors. The nature of the adsorbed substance has not been clearly established.

The drying of linseed oil in the presence of driers. H. D. Pagani (Politecnico, Milan). *Ann. chim. applicata 35,* 249-56 (1945). From rosin of acid No. 164, saponification No. 176, I No. 123, α-, β-, and γ-abietic acid were separated by the method of Tschirch, in yields of 9.53, 6.35, and 66.19% respectively. The lead salts of these acids and rosin were used as catalyzers in the drying of linseed oil. The catalytic activity decreases β-abietate, rosinate, α-abietate, γ-abietate. It is not economically convenient to isolate the β-isomer; it is more useful to use a mixture of the α- and β-isomers. The catalytic activity of the lead salt does not decrease in 131 days after preparation. Acid salts show less catalytic activity than neutral salts. (*Chem. Abs. 40,* 7655.)

PATENTS

Treatment of polyene compounds. A. W. Ralston and O. Turinsky (Armour and Co.). *U. S. 2,411,111-13.* An iodide (inorganic iodide or organic amine hydroiodides) is used as a conjugation catalyst.

Modification of alkyd resins. L. Auer. *U. S. 2,410,418.* The viscosity of long oil alkyd resins is increased by addition of 5-10% *p*-toluene sulpho chloride and heat treating to between 260° and the boiling or decomposition point of the mixture.

Ricinoleic esters and glycerol. E. M. Meade, Lankro Chemicals, Ltd., and F. H. Kroch. *Brit. 566,324.* The esters and glycerol are manufactured by the reaction of castor oil with at least 6 molecular proportions of CH_3OH in the presence of an alkaline metal hydroxide as catalyst. (*Chem. Abs. 40,* 6499.)

Conversion of tall oil to a drying oil. O. Svensson. *Swed. 104,969.* Tall oil is converted to a drying oil by boiling it with one or more lower organic acids, *e.g.*, acetic, formic, or oxalic acid. There may be present a catalyst, such as an oxide or salt of Pb or Mn, as well as a compound capable of combining with rosin acids, such as the oxides of Zn, Pb or Ca. A stream of air is passed through the mass during the heating. (*Chem. Abs. 40,* 7660.)

Abstracts

Soaps

Edited by
LENORE PETCHAFT

Investigation of soaps containing filler. Bela Lutter and Vera Tolnay (Kgl. ung. landwirtschaftl. Versuchstation, Debrecen, Hungary). *Mezogazdasagi Kutatasok. 16,* 213-19 (1943); *Chem. Zentr.* 1944, *II,* 379. In the examination of soaps containing filler (clay) special care must be exercised in preparing the samples. The thinly sliced soap should be dried in a drying oven and then thoroughly ground to assure a homogeneous sample. The salts of the fatty acids can be extracted by 3 hrs. treatment with 96% alcohol and the fatty acids can then be determined by the following method: The pure soap extracted from 2 g. of the original sample is washed into a 200-cc. graduated cylinder and 20 cc. of 10% H_2SO_4 is added. The mixture is then well shaken with 100 cc. of ether, allowed to stand for 30 min. and the volume of the ether layer is read off. Then 50 cc. of the ether extract is pipetted off, the ether is evaporated, and the residue of fatty acids is dried for 1 hr. at 105° The rapid method of Grossfeld can be used, although it gives values which are somewhat too low with soaps containing oxy-fatty acids. (*Chem. Abs. 40,* 6851.)

The application of thiosulfate in the soap industry. Josef Hetzer. *Seifensieder-Ztg.* 1944, 65. Eighteen g. of $Na_2S_2O_3 \cdot 5H_2O$, technically called Antichlor (I), was added to 10 kg. of curd soap, and pressed and unpressed samples were stored 6-8 months and compared with controls containing no I. The controls yellowed more than the test samples; the pressed samples were more so than the unpressed. The controls developed yellow spots while the test samples did not. The cost of the treatment in practice is 0.42RM per 1000 kg. of soap. (*Chem. Abs. 40,* 6837.)

The hydration of polyphosphates. G. Corsaro. *Am. Perfumer 48,* No. 8, 64, 69, 73, 75 (1946). The solubilities, pH characteristics in aqueous solutions, sequestering abilities for Ca, Mg, Fe, etc., and H_2O stabilities of 5 commercial polyphosphates were studied. Specifically, the solubilities and pH values of 1% solutions of $Na_4P_2O_7$ (I), $Na_5P_3O_{10}$ (II), $Na_6P_4O_{13}$ (III), $Na_6P_6O_{18}$ (IV), and $Na_9P_7O_{22}$ (V) are given. A titration procedure was devised to compare relative sequestering action. On a weight basis the order of decreasing efficiency was V, IV, III, II, I. Time and temperature as factors affecting the stability of these phosphates in aqueous solutions were investigated. In general, the rate of conversion to orthophosphate increased as the size of the anion increased. Reaction rates for these hydration processes were obtained and a procedure is given for application in industrial processes. (*Chem. Abs. 40,* 6358.)

Fibers, detergent, dirt. W. Kling. *Tek. Tik. 74,* 565-72 (1944). More recent investigations of the fine structure of textile fibers are described, and the molecular structure of the most important detergents, such as anion-active alkali soaps, alkyl sulfates, aliphatic-alcohol sulfonates and various fatty-acid condensation products, their composition and solvent properties at different concentrations are illustrated; cation-active products were found of no importance. (*Chem. Abs. 40,* 6852.)

Micellar association of ionic and non-ionic detergents in non-ionizing solvents. Emanuel Gonick (Stanford Univ., California). *J. Colloid Science 1,* 393-5 (1946). Measurements of freezing point depressions produced by 2 soluble soaps in benzene, hexanolamine oleate and hexanolamine caprylate, show that this association does occur. Evidence is also presented showing that the non-electrolytic detergent, nonaethyleneglycol (mono) laurate is associated in cyclohexane, but is not associated in benzene. However, data demonstrate that this compound forms micelles in water.

Wetting agents in the modern tannery. Paul I. Smith. *Soap 22,* No. 11, 43, 143 (1946). Typical uses for the new wetting agents may be in preliminary soaking of hides and skins, in vegetable tanning to increase penetration of tannins, in the dye bath as a means of insuring level dyeing, in the preparation of fat liquors, and in scouring fur and similar materials. The desired properties are discussed.

PATENTS

Cold soap for finishing purposes. Elliott and Blackman. *Brit. 575,949.* A practical formula for manufacturing "cold soap," widely used in finishing plants, also in rinsing operation is given: into a crutching pan 459.5 lbs. palm kernel oil are run; 437.5 lbs. of NaOH 32° Bé are added at 86-90° F. On the other hand, 204 lbs. rosin-oil or grease mixture 40:60 are treated with 12½ lbs. KOH (28° Bé) and added to the mass described above. The mass solidifies but becomes quickly liquid again after some minutes. Thereupon the alkali calculated for completing and saponifying the whole amount of fats and rosins is added. The soaps are said to remain homogeneous in storage. (*Am. Dyestuff Reporter 35,503.*)

Germicidal soap-like preparations. Albert L. Rawlins (Parke, Davis & Co.). *U. S. 2,406,902.* Salts of hexadecyl amine and octadecyl amine, when used with a germicidal water-soluble high molecular quaternary ammonium compound, give soap-like preparations with excellent lathering and germicidal properties.

Aqueous alkaline reacting cleaning bath having reduced foaming characteristics. H. E. Tremain and L. R. Bacon (Wyandotte Chem. Corp.). *U. S. 2,407,589.* An aqueous alkaline solution having reduced foaming characteristics contains in addition to water, a soluble alkaline agent, and a constituent tending to produce foam, admixed with a minimum of .01% of di-tertiary-amylphenoxyethanol, p-tertiary-amylphenoxyethanol or diamyl phenol.