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ABSTRACTS

Oils and Fats

Edited by
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MILK FAT IN MILK CHOCOLATE. L. W. Ferris (Food and Drug Admin. Federal Security Agency, Buffalo, N. Y.). *J. Assoc. of Agr. Chem. 31,* 728-31(1948). Straight extraction of milk chocolate as in the A. O. A. C. method leaves unextracted a small amount of fat, which is principally milk fat. A newly proposed method is based on repeated shakings with ether, centrifuging, and decanting solvent oil layer.

ESTERS OF NATURALLY OCCURRING FATTY ACIDS. Carl W. Bonhurst, Paul M. Althouse, and Howard O. Triebold. Ind. Eng. Chem. *40,* 2379-84(1948). An apparatus is described and the operating procedure is given for the determination of a complete vapor pressure curve on one or two drops of a pure liquid. The apparatus was calibrated, and the vapor pressure curve for each of the methyl, propyl, and isopropyl esters of the naturally occurring C_6 to C_{18} saturated fatty acids was determined. Decomposition of the esters was found to be progressive above 205°C. and occurred over a wide temperature range rather than at a specific temperature. The relationships of the densities and viscosities of the esters to temperature were studied by determining these constants at 20°, 37.8°, 60°, and 98.9°C. Relationships between the vapor pressures, densities, and viscosities indicate that the forces governing these three properties have some factor or factors in common.

THE RAMAN SPECTROGRAMS AND THE STRUCTURE OF OLEIC AND ELAIDIC ACIDS. A. van den Hende (Univ. Ghent, Belg.). *Bull. soc. chim. Belges 56,* 328-38 (1947). Useful Raman spectrograms have been obtained for oleic acid, ethyl oleate, and their ethylene stereoisomers, elaidic acid, and ethyl elaidate. The spectra show that the frequencies due to the double union between the 2 doubly bound C atoms have a lower value for the oleic acid and the oleate than for the elaidic acid and the elaidate. It had already been observed that in many groups of unsaturated compounds the mention frequencies are smaller for the cis than for the trans isomers. The Raman spectra indicate the cis structure for oleic acid and the trans structure for elaidic acid. (*Chem. Abs. 42,* 6667-8.)

WATER INSOLUBLE FATTY ACIDS IN CREAM AND BUTTER. F. Hillig and S. W. Ahlmann (Food and Drug Admin., Washington, D. C.). *J. Assoc. Agr. Chem. 31,* 739-49(1948). Data are presented on the determination of WIA in 90 authentic churns of butter. When decomposed cream was present in the churn more WIA were found in the butter, in most cases, than in the butter churned from cream containing no decomposed material. It was shown that WIA in cream, for the most part, are retained in the butter on churning. Individual cans of cream classified as being decomposed usually contained much larger quantities of WIA than cans classified as satisfactory for butter making. There was in general little or no increase in WIA in butters stored at 0°F. for 5 months. Except in those cases in which visible mold appeared, there was no significant change in WIA in butters stored for 5 months at 40°F.

VOLATILE ACIDS IN CREAM AND BUTTER. PART I. THE DEVELOPMENT OF BUTYRIC ACID DURING THE PROGRESSIVE DECOMPOSITION OF CREAM. F. Hillig (Food and Drug Admin., Washington, D. C.). *J. Assoc. of Agr. Chem. 31,* 750-60 (1948). Progressive decomposition experiments on cream show that butyric acid is frequently produced in cream when it reaches that stage of deterioration where it is unfit for human consumption. Results indicate that the butyric acid probably results from the breakdown of the lactose, through lactic acid as an intermediate step, and not from the hydrolysis of the fat and accompanying liberation of the combined butyric acid in the glycerides. When the acid is present in cream, some is usually carried over into the butter made therefrom.

DETERMINATION OF WATER INSOLUBLE FATTY ACIDS IN DRIED EGGS. F. Hillig (Food and Drug Admin., Washington, D. C.). *J. Assoc. Agr. Chem. 31,* 731-4 (1948). An adaptation of the method for determination of water-insoluble fatty acids (WIA) in cream and butter is proposed for the determination of these acids in dried eggs. It has been shown that small amounts of WIA are found in authentic dried edible eggs, but that when liquid eggs are allowed to become sour before drying, the WIA in the dried product are increased several fold. Commercial dried eggs of acceptable quality were found to contain WIA in the range found for authentic dried edible eggs.

EFFECTS OF AUTOXIDATION ON ANTIACRODYNIC POTENCY OF FATS AND LINOLEIC ESTERS. F. A. Kummerow, Ta-Kung Chu, and P. Randolph (Kansas Agr. Exper. Sta., Manhattan). *J. Nutr. 36,* 523-36 (1948). The ability of small quantities of oxidized fats to cure acrodynia was used as a means of testing their nutritive value. The results indicated that rancid Me linoleate or the fat extracted from turkeys which had been subjected to cold storage for 2 years alleviated the symptoms but were not as effective as the freshly distilled ester or fresh turkey fat. Tocopherol did not improve the effectiveness of rancid Et linoleate and ethanolamine aggravated the symptoms. Drastically oxidized fats or 10, 12 Et linoleate were not effective curative agents. When pyridoxine and Ca pantothenate were fed in addition to rancid fat the dermal symptoms were alleviated. This response was not due to pyridoxine or Ca pantothenate alone, but to a combination of the fat- and water-soluble factors. Spectrophotometric analysis of the carcass fats indicated that the various supplements of oxidized linoleic esters were converted to oleic and saturated fatty acids. Pyridoxine and Ca pantothenate seemed to be functional in this process.

FAT-NECROSIS STUDIES. V. THE EFFECT OF SOYBEAN AND PEANUT FEEDING ON THE BLOOD AND URINE LIPASE OF RABBITS AND IN THE PRODUCTION OF FAT NECROSIS. M. Pinson Neal (Univ. Missouri School of Med., Columbia). *Southern Med. J. 38,* 793-9(1945). Fat necrosis is not produced in animals per se by feeding them lipase-containing vegetable seeds, as peanuts and soybeans. (*Chem. Abs. 42,* 7386.)

PARENTERAL NUTRITION. VII. METABOLIC STUDIES ON PUPPIES INFUSED WITH FAT EMULSIONS. G. V. Mann *et al.* (Boston, Mass.). *J. Lab. & Clin. Med. 33,* 1503-22(1948). Two litters of puppies were used to assay the contribution of an intravenous emulsion of 30% coconut oil to energy requirements. As judged by growth and nitrogen balance, growing puppies were able to utilize up to 30% of their total energy requirements supplied as fat emulsion intravenously. Chemical data indicated no disturbance of plasma proteins, nonprotein nitrogen, bilirubin, or liver function during the infusions. A moderate normocytic anemia developed in the animals that were infused, regardless of whether they were infused with fat emulsion or just the phosphatide stabilizer. The anemia was self-limited, responded favorably when the infusions were stopped, and in many respects resembled the anemia of infection.

THE ABSORPTION OF FAT DURING THE CONSUMPTION OF DIETS RICH IN WHOLE GRAIN AND WHITE BREADS. A. R. P. Walker (So. African Inst. Med. Res., Johannesburg). *J. Hyg. 46,* 194-7(1948). The fat metabolism of 3 healthy adult European males was studied for periods of 7-22 consecutive weeks. A diet rich in whole-grain bread, when combined with one rich in white bread does not lead to any appreciable diminution in the amount of fat absorbed. (*Chem. Abs. 42,* 8903.)

THE EFEFCT OF DIETARY FAT ON UTILIZATION OF THE ENERGY AND PROTEIN OF RATIONS BY SHEEP. R. W. Swift, J. W. Bratzler, W. H. James, A. D. Tillman, and D. C. Meed (The Pennsylvania State College). *J. Animal Sci. 7,* 475-85 (1948). Six rations, made isocaloric by reciprocal variation between added fat and carbohydrate and containing 3, 4, 5, 6, 7, and 8% ether extract respectively, and furnishing equal amounts of protein were fed to a group of 16 sheep. Digestibility, heat production, and methane were determined, the utilization of protein and energy being about the same for all 6 rations. The effects of reciprocal variation between added dietary fat and carbohydrate makes difficult the assignment of results to either one of these 2 ration components. Based on the amount of carbohydrate digested, a formula is given for the production of methane by sheep.

THE EFFECT OF PREVIOUS DIET ON THE ABILITY OF ANIMALS TO DO WORK DURING SUBSEQUENT FASTING. L. T. Samuels, R. C. Gilmore, and R. M. Reinecke (Univ. Utah, Salt Lake City). *J. Nutr. 36,* 639-51 (1948). With the rat as the experimental animal the administration of a high fat diet (fat furnishing 80% of calories) led to longer survival during subsequent fasting and the ability to do greater amounts of work before exhaustion than a high carbohydrate or high protein diet fed in equicaloric amounts. The protein-fed rats survived for the shortest period. The difference between the fat and carbohydrate groups could be accounted for on the basis of the difference in the metabolic mixture used and the lower voluntary activity of the fat-fed animals. The early deaths of rats previously on a high protein diet were not explained by these experiments.

INTRAVENOUS INFUSIONS OF A COMBINED FAT EMULSION IN DOGS. B. G. P. Shafiroff, H. Baron, and E. Roth. *Proc. Soc. Exp. Biol. & Med. 69,* 387-91(1948). A combined emulsion of fat protein and glucose was infused intravenously in a series of 19 dogs. Toxic reactions such as secondary anemia and degenerative pathology in vital organs failed to develop after prolonged injections of the combined emulsion. An attempt was made to correlate the associated laboratory tests with the biochemical functions of hydrolysis and assimilation of fat.

OXIDATION IN VIVO OF EMULSIFIED RADIOACTIVE TRILAURIN ADMINISTERED INTRAVENOUSLY. Robert P. Geyer, June Chipman, and F. J. Stare. *J. Biol. Chem. 176,* 1469-70(1948). Seventy-one per cent of the C^{14} injected as trilaurin containing C^{14} was expired as $C^{14}O_2$. This suggests that emulsified fat is utilized immediately after injection.

EFFECT OF CHOLECYSTECTOMY ON FECAL FAT EXCRETION IN DOGS. J. R. Heersma and J. H. Annegers. *Proc. Soc. Expt. Biol. & Med. 69,* 140-41(1948). In 8 dogs studied both before and after operation, cholecystectomy produced no significant change in the daily excretion of fat or nitrogen in the feces.

THE LIPIDES OF THE RAT BRAIN AND LIVER IN CHOLINE DEFICIENCY. Piero P. Foa, Harriet R. Weinstein, and Bernard Kleppel. *Arch. Biochem. 19,* 209-12(1948). Choline deficiency does not affect the total lipide, total phospholipide, sphingomyelin, lecithin, cephalin, and cholesterol content of the rat brain. Although brain hemorrhages were not observed in these experiments, it is believed that the hemorrhages observed by others in the central nervous system of choline-deficient rats are probably not due to insufficient supply of phospholipides. Choline deficiency decreases the lecithin content of the liver. This decrease is reversed by choline supplements. When the food consumption is equalized, choline deficiency does not affect growth.

THE ACTION OF ETHANOLAMINE, METHYLETHANOLAMINE, AND DIMETHYLETHANOLAMINE ON LIPIDE PHOSPHOYLATION. Camillo Artom and W. E. Cornatzer. *J. Biol. Chem. 176,* 949-59(1948). Rats maintained on a low casein, low fat diet were given by stomach tube a single dose of ethanolamine, methylethanolamine, dimethylethanolamine, or choline. The controls received water. The animals were then injected with isotopic phosphate and the radioactivity and the phosphorus content determined in the lipides of the liver and small intestine. All the substances tested stimulated the formation of total phospholipides in both tissues. The stimulation by ethanolamine and by the products of its partial methylation was of the same order of magnitude or greater than that observed after choline was given.

Action of colamine and ascorbic acid on the autoxidation of fats and vitamin A. G. Kh. Bunyatyan and G. V. Kamalyan (Armenian Acad. Sci., Russia). *Biokhimiya 13,* 109-14(1948). It had previously been shown that phosphatides alone check the autoxidation of fats and of vitamin A, but that in the presence of Cu and Fe they increase the autoxidation process at a much faster rate than Cu and Fe by themselves. Choline alone is without effect on the autoxidation process, but together with Fe, and especially Cu, it increases peroxide formation at a faster rate than that produced by the metal ions alone. Colamine, in amounts of 0.01-0.05 ml. per 30 g. fat, checks the autoxidation of animal and plant fats and of vitamin A. But in the presence of Cu, colamine enhances oxidation over that given by Cu alone. Fe alone or in combination with colamine is without effect on the autoxidation of fats. Ascorbic acid (1 mg./g. fat) exerts a synergistic effect on the antioxidant action of colamine. Ascorbic acid completely checks the pro-oxidant action of colamine plus Cu. It is recommended that a mixture of colamine with ascorbic acid be used as antioxidants for fats and for the accompanying vitamin A. (*Chem. Abs. 42,* 8841-42.)

The metabolism in vitro of triacetic acid and related diketones. Robert F. Witter and Elmer Stotz. *J. Biol. Chem. 176,* 501-10(1948). Triacetic acid is rapidly metabolized by rat liver homogenate and an enzyme isolated from liver, yielding in both cases 1 mole of acetoacetate and 1 of acetate. Triacetic ester is rapidly metabolized by liver through the successive action of an esterase and the triacetic acid enzyme. Triacetic lactone is metabolized by rat liver at about one-eighth the rate of the free acid. The implications of these findings to studies of fat metabolism are discussed.

Antispasmodic action of polyalcohols. I. Glycerol. II. Sodium glycerophosphate. B. L. Velazquez, P. Garcia de Jalon, and A. P. Carnicero (Inst. med. exptl., Madrid). *Trabajos inst. nacl. cienc. med.* (Madrid). *2,* 305-17(1943-44). It is claimed that glycerol exerts a spasmolytic action on smooth muscles *in situ* following the application of $BaCl_2$, pilocarpine, ergotamine, pituitrin, and histamine. No data are presented. Concentrations of from 0.5-1 c.c. in 75 c.c. bath fluid cause relaxation of the isolated guinea pig intestine and uterus. This effect is a function of the OH groups. It has a short hypotensor effect. Its action is primarily peripheral. Na glycerophosphate has essentially the same effect as glycerol, having the advantage of better tolerance and less hemolytic action. Its principal effect is on the uterus. It may be used clinically with from 2-5 c.c. of a 25-50% solution given intravenously as a uterine sedative and against threatened abortion. (*Chem. Abs. 42,* 8962.)

The structures of transparent water and oil dispersions (solubilized oils). J. H. Schulman and T. S. McRoberts (Cambridge Univ., Eng.). *Trans. Faraday Soc. 42B,* 165-70(1946). To equal volumes of oil and water, soap in varying concentrations was added. This mixture was titrated to fluid transparency by phenols and aliphatic alcohols, Et, Pr, Bu, and Am alcohol give conducting systems with benzene over the range of soap concentration. This continuous phase inverts to the nonconducting oil very sharply at hexyl alcohol. Cyclohexanol and phenol give a water-continuous system, and *p*-methylcyclohexanol and *m*-cresol, an oil-continuous system. It was suggested that the continuity of the phase is related to the contact angle between the oil, water, and the mixed interfacial film of soap/alcohol and that the alcohol mol. penetrates the lamellar lattice of the swollen soap micelle film. These droplets can swell, on decreasing the soap concentration, to visible dimensions according to the associating and dispersing powers of the alcohol mol. with the Na oleate mol. (*Chem. Abs. 42,* 6610.)

Some observations on factors affecting the structure of calcium soap lubricating grease. L. W. Sproule and W. C. Pattenden. *Can. J. Res. 26F,* 465-8(1948). Examination with the electron microscope indicates that the soap particles contained in Ca soap lubricating greases have an unusual structure. They are about 1 μ long, and consist of fibers coiled in spiral forms, or of 2 twisted together in a ropelike manner. The effect of 2 factors on the form of the dispersed soap particles was investigated. The addition of water to stabilize a dispersion of Ca soap in mineral oil was found to orientate the soap particles from minute, nondescript form to fibers having a wavy, loosely coiled appearance. The shearing action associated with the mixing of the grease during its preparation caused the fibers to assume a spiral or twisted form.

Action of rust-preventive oils. E. R. Barnum, R. G. Larsen, and A. Wachter (Shell Development Co., Emeryville, Calif.). *Corrosion 4,* 423-31(1948). The following mechanism by which oil solutions of polar compounds protect steel is proposed: Polar mols. are adsorbed as oriented multimol. layers at the steel-oil interface. These layers retain oil in their interstices forming a mixed film which is more impervious to water than either the additive or oil alone. Additives with weak attractive forces forming only mono- or bi-mol. layers are not effective rust inhibitors. A minimum of about 6 mol. layers is required to form an effective barrier against moisture. Compounded oils displace water from steel if the adsorptive forces of the additive for steel are greater than those of water for steel and consequently form a more stable interface (one of lower energy). (*Chem. Abs. 42,* 7693-4.)

PATENTS

Process of rendering oleaginous tissue material. Louis H. Libby and Lloyd F. Henderson. *U. S. 2,455,374.* Fatty tissue is rendered in the presence of hydrated silica. Rendered fats of low color and better stability are said to be produced by the method.

Shortening of good texture. Arne Gudheim. *U. S. 2,455,363.* The shortening composition of suitable liquid to solid ratio is warmed to 68-75°F. and quickly cooled to 15°C. and kept at this temperature until the heat of crystallization has been liberated.

OLEOMARGARINE COLORING UNIT. Leon Adler, Harold G. Johnson, and Beeason J. Schneider. *U. S. 2,454,420.* The coloring capsule is coated with sugar and is placed in a block of margarine as a unit.

INHIBITING REVERSION OF OILS. Wendell W. Moyer and Ralph A. Marmor. *U. S. 2,454,937.* Material causing reversion and rancidity in soybean oil is removed by treatment of the oil with MgO which has been heated at 350-500°.

TOCOPHEROL CONCENTRATE. Norris D. Embree and Noel H. Kuhrt. *U. S. 2,454,692.* Deodorization sludge is extracted with normally gaseous hydrocarbons at approximately the phase point temperature of the hydrocarbons and then recovered from the solvent.

ANTIOXIDANT. Wilbur I. Patterson and Martin B. Williamson. *U. S. 2,455,088.* Antioxidant is extracted from rice bran with MeOH and the sirupy residue is then re-extracted with ether.

ANTIOXIDANT FROM RICE BRAN. Charles Jarowski and Eric T. Stiller. *U. S. 2,455,255.* Rice bran is defatted with organic solvent, the defatted material is extracted with water soluble organic solvent, Na ethoxide is added, and the Na salt of the antioxidant precipitates.

ANTIOXIDANTS. Charles I. Jarowski and Eric T. Stiller. *U. S. 2,455,254.* Special polyphenolic compounds such as divanillal acetone and divanillae isopropanol are antioxidants for fatty materials.

ANTIOXIDANT. Charles I. Jarowski. *U. S. 2,455,256.* Diisoeugenol is used as an antioxidant.

TEXTILE MATERIAL WATER REPELLENT. Peter J. Ariente and Herman C. Allen. *U. S. 2,455,886.* Repellency is imparted by a dry residue of an aqueous dispersion of cetyl acetamide, zirconium stearate, and zirconium formate in approximately the relative proportions four parts by weight of cetyl acetamide to one part by weight of zirconium stearate to one-third part by weight of zirconium formate.

PETROLEUM DEMULSIFIER. Willard H. Kirkpatrick and Doyne L. Wilson. *U. S. 2,454,808.* The demulsifier is an ester of tall oil acids and polyethylene glycol.

LUBRICATING GREASES. Harold M. Fraser. *U. S. 2,455,892.* A lubricating grease composition comprises a lubricating oil base and containing alkali metal compounds 8-35%, of which about 2.5-12.5% is lithium acetate, 1.0-15% is lithium naphthenate, the balance being lithium stearate, and the percentages being selected such that the major proportion is lithium stearate.

Drying Oils

Edited by
ROBERT E. BEAL

ISOMERIZATION OF OILS: THE CHEMISTRY OF THERMAL TREATMENT AND OXIDATIVE CHANGES. E. H. Farmer. *J. Oil & Colour Chemists' Assoc. 31,* 393-405(1948). Although thermal treatment of saturated C chains at cracking temperatures produces non-polar chain scission of C-C bonds, olefinic hydrocarbons undergo detachment of an α-methylene H at somewhat lower temperatures and the radical formed is either stabilized by reaction with other radicals or may undergo dimerization as in the case of drying oils. Experiments with degassed materials which polymerize very slowly demonstrate that oxygenated radicals derived from oxidation products greatly accelerate the C-H splitting. Under thermal treatment pentadiene follows a course of H severence, double bond shift, cyclization to a mono- or bicyclic form, and stabilization by H ion capture. Drying oils react similarly. However, since they are nonvinylic and cannot easily add to simple olefinic double bonds it is their polarization brought about by hydrogen removal and subsequent resonance of the double bonds between the $\Delta^{1,3}$ and $\Delta^{1,4}$ positions which accounts for their additive reaction with other polyunsaturated molecules. Hydrogenation studies indicate that methyl linoleate and methyl linolenate dimers and trimers are mono-cyclic. Elaeostearic esters probably form bicyclic trimers and the cyclohexanic ring may become aromatic through H rejection. Mono-olefinic molecules do not polymerize unless the double bond is at the end of the chain.

Oxidation of drying oils occurs more rapidly than polymerization if O is provided. Conjugated molecules add O at one end of the unsaturated system while in the case of unconjugated molecules the oxidation occurs at the α-methylene carbon and is initiated by peroxide decomposition products at ordinary temperatures. Conjugated systems oxidize to a stable dialkyl peroxide while nonconjugated molecules form peroxides initially which largely are converted to hydroperoxides. The latter are easily decomposed to give OH radicals capable of detaching H atoms, adding to double bonds, or substituting directly in the C chain. Peroxides decompose to some extent and chain scission results. When blown or boiled oils are prepared a variety of products are formed since peroxide breakdown is rapid. One function of metallic paint driers is to facilitate peroxide decomposition and thus provide a supply of peroxidation-initiating radicals.

DRYING MINERAL OIL AND ITS APPLICATIONS. H. Kemner. *Farben, Lacke, Anstrichstoffe 1,* 85-9(1947). Air-drying mineral oil, *Firnagral,* is a dark, viscous, tarry-smelling oil soluble in hydrocarbons and butyl acetate and compatible with drying oils and certain resins. The dried film is thermoplastic and by suitable combination with tung stand oil, resin, and driers the oil film dries in 10 hours. (*Chem. Abs. 42,* 8488.)

MINERAL-OIL DERIVATIVES AS PAINT BINDERS. H. Kolln. *Farben, Lacke, Anstrichstoffe 1,* 83-5(1947). Air-drying hydrocarbon oils obtained from lubricating oils by liquid-liquid extraction, *Firnagral,* dry slower than vegetable drying oils, and turn short on aging. Addition of resins does not speed drying but the use of high pigment concentrations and a moderate amount of drier does. The films are water resistant and do not chalk but they dull quickly. Distillation to remove 20-40% of the oil or addition of S at 200-260° increases drying power. (*Chem. Abs. 42,* 8488.)

ALKYD RESINS—A REVIEW OF THE PAST 10 YEARS. F. C. J. Ruzicka. *Oil Colour Trades J. 114,* 442, 444, 446, 500, 502, 504, 556, 558, 615-16, 618(1948). Research of interest in the field of surface coatings is summarized. (*Chem. Abs.*)

Aluminum-active linseed oil oxyns. II. Liquid linseed oil oxyns. E. Eigenberger (Deyt. Tech. Hochschule, Prague, Czechoslovakia). *Fette u. Seifen 51,* 87-93(1944). Oxidative aging of linseed oil, linseed oil acids and their methyl esters under varied conditions was followed by the Al number, acid value, I number, refractive index, specific gravity, active O, and saponification number. (*Chem. Abs.*)

Drying oils, driers, and varnishes. C. W. A. Mundy and J. H. Greaves. *Ann. Repts. Soc. Chem. Ind. Progress Applied Chem. 29,* 309-13(1944). (*Chem. Abs.*)

Alkyd resins. C. C. West (U. S. Industrial Chemicals, Inc.). *Official Digest Federation Paint & Varnish Production Clubs 285,* 773-83(1948). Gloss retention is influenced more by polyhydric alcohol functionality than any other factor.

Preparation of monoglycerides in view of the manufacture of modified alkyd resins. J. Petit (Paint & Varnish Research Laboratory, Paris). *Am. Paint J. 33,* 82-102(1948). Reactions which occur during the preparation of monoglycerides by glycerolysis of triglycerides were investigated. Dimerization of fatty acid radicals is negligible if the reaction is not prolonged. A significant amount of polyglycerol and diglycerol esters are formed, especially if metallic soaps are present and an excess of glycerol is used. KOH was the most effective catalyst found.

Drying oils. J. C. Konen (Archer-Daniels-Midland Co., Minneapolis, Minn.). *Official Digest Federation Paint & Varnish Production Clubs 284,* 697-711 (1948). Types of modern drying oils, their history, manufacture and technology, and theories of polymerization and drying are reviewed.

The versatile role of soybean oil in coatings. A. G. Hovey (General Mills, Inc., Minneapolis, Minn.). *Official Digest Federation Paint & Varnish Production Clubs 284,* 697-711(1948). The treatment and uses of the oil in the coatings industry are reviewed. 36 references.

Driers. C. A. Klebsattel (Advance Solvent and Chemical Corp.). *Official Digest Federation Paint & Varnish Production Clubs 284,* 686-94(1948). cf. J. Am. Oil Chemists' Soc. 26, No. 1, Drying Oil Abs.

PATENTS

Linseed-oil-like synthetic products from synthetic fatty acids and acetylene. J. Rinse and W. Dorst. *Dutch 61,516.* A mixture of fatty acids resulting from the oxidation of paraffin, a drying oil, and a Cd or Zn catalyst are reacted with acetylene to produce an oil which dries in 24 hours to a glossy, water-resistant film. (*Chem. Abs. 42,* 8493.)

Soap

Edited bv
LENORE PETCHAFT

Detergents—the new synthetics. Lawrence Flett (National Aniline Division, Allied Chemical & Dye Corp., New York). *Am. Perfumer Essent. Oil Rev. 52,* 519-21, 523(1948). A review of the new applications and future market for synthetic detergents.

Soap substitutes in the worsted industry. R. W. Moncrieff. *Soap, Perfumery & Cosmetics 21,* 1114-5 (1948). The use of synthetics such as Teepol (ester of a secondary fatty alcohol) and Lissapol N (ethylene oxide condensation product) in wool processing is reviewed.

Antiseptic soap. M. Martin Maglio (Vestal Laboratories, Inc., St. Louis, Mo.). *Soap Sanit. Chemicals 24,* No. 12, 44-5, 157, 159(1948). The use of phenol derivatives such as G-11 is described and results of tests showing effectiveness of this compound are reviewed. 30 references.

Adsorption of surface-active agents by fibers. J. C. Harris (Monsanto Chem. Co., Dayton, Ohio). *Textile Research Journal 18,* 669-79(1948). This paper reviews the ability of textile fibers to remove surface-active agents from solution. The characteristics of surface-active agents which are likely to affect their degree of adsorption of fibers are (1) degree of surface activity, (2) degree of solubility, (3) critical concentration of micelle formation, (4) degree of ionization, and (5) electrophoretic charge. The adsorption of the various types of surface-active agents by cotton, wool, and silk was tested and results listed. The mechanism of adsorption is outlined.

Detergent action-mechanical work as a measure of efficiency of surface active agents in removing soil. Osborne C. Bacon and J. Edward Smith (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.). *Ind. Eng. Chem. 40,* 2361-70(1948). Over the range of concentration and mechanical work variations studied in a detergent process and where increased detergent concentration is accompanied by increased soil removal it is shown that: the concentration of detergent required is inversely proportional to the mechanical force applied when the degree of soil removal, time and temperature are kept constant; the time of scouring and the detergent concentration required are inversely proportional when the degree of soil removal, force, and temperature are kept constant; the time of scouring and the force are inversely proportional when concentration, temperature, and degree of soil removal are kept constant. An equation relating detergent action with concentration of detergent, mechanical force, and time has been derived for that portion of the detergency curve where increased detergent concentration is accompanied by increased soil removal. A method for calculating the per cent colored-soil removal from reflectance data has been developed.

The influence of sodium carboxymethyl cellulose on the suspending power of soap and soap-builder solutions. C. H. Bayley, A. S. Weatherburn, and C. R. F. Rose (National Research Council of Canada, Ottowa, Can.). *Laundry & Dry Cleaning J.*, Dec. 1948. These authors investigated the effect of additions of CMC on the suspending power of built and unbuilt soap solutions. Soap or soap-builder combination solutions at certain fixed concentrations were taken as the basis for comparisons, and the suspending powers of these solutions were compared with those of solutions in which a part of the soap or soap-builder content was replaced by a proportionately smaller amount of CMC. Results showed that soap by itself cannot be replaced by CMC without some loss in suspending power, however, in the case of soap-builder combinations, the addition of CMC results in some improvement in suspending power.

The rancidity of decolorized soaps made from neutralization foots of olive oil. Francesco Muscari Tomaioli. *Riv. ital. essenze, profumi, piante offic., olii vegetali, saponi. 30,* 166-9 (1948). Soaps obtained from neutralization foots of olive oil have a tendency to become rapidly rancid. Decolorizing treatment with Ca hypochlorite or Na hydrosulfite gives incompletely decolorized soaps. Decolorization with $K_2S_2O_8$ gives good results, but the soaps must be newly cooked after the treatment to saponify the freed fatty acids. The use of compressed air bubbled into the mixture favors rancidity. Na silicate (1%) retards the oxidation. Cu salts used as catalysts for the decolorization also catalyze rancidity-producing reactions. (*Chem. Abs. 42,* 9208.)

Comparative study of the activity of wetting agents towards a test paper. August Noll. *Wochbl. Papierfabr. 76,* 163-5 (1948). The Netzometer *(I)* used in testing the wettability of papers has been described. N. has extended the use of *I* to a comparative study of the effectiveness of various commercial wetting agents, detergents, and textile dressing agents. The reagents (10 g./l.) were applied to a specific test paper under the usual conditions. "Igepal W" acted within 14 sec. whereas "Lamepon A" failed to wet the strip within 3600 secs. Marked changes in wetting action were noted when some of the agents were extracted with alcohol prior to use. Thus "Nekal A," which caused wetting within 63 secs., required 574 secs. after alcohol extraction. On the other hand, "Igepon A" paste, which required more than 1 hr. to wet the sample, acted within 30 sec. after alcohol extraction. In all cases the wetting tests were made in triplicate and close checks were obtained. N. gives a sketch of the equipment. 25 references. (*Chem. Abs. 42,* 8471.)

Perfumes and soaps. M. N. Havrenne (Forest, Brussels, Belg.). *Ing. chim. 129,* No. 170, 97-100 (1947). Perfumes, natural and synthetic, are classified according to their manufacture, their chemical structure, and their tenacity. Spoiling of soaps may be due to improper manufacture, use of poor materials, the presence of compounds which act as catalyst in the oxidation of the oils or fats in the soap, thus causing rancidity, or to the perfume used. H. reviews current ideas as to the effect of functional groups, such as aldehydes, ketones, phenols, alcohol esters, and acids, in the perfume. Chemical tests are of little value but if the acid or phenol content is too high the perfume should be rejected and standard tests for determining them are reviewed. Nor are olfactory tests satisfactory because of the reciprocal action of perfume and soap. Perfumes having an objectionable odor may, when combined with the soap, be very agreeable and vice versa. Before adopting a new perfume test, bars of the soap containing the perfume should be made and examined daily for a month. The perfume should be strong but not harsh, and should last as long as the soap. The bars should be examined for color changes under a Hg lamp, 30 hours' exposure being equivalent to a month of sunlight. Four references. (*Chem. Abs. 42,* 9075.)

Studies of aluminum soaps. VII. Aluminum soaps in hydrocarbons. The gels and jellies and transformations between them. James W. McBain, Karol J. Mysels, and Gerould H. Smith (Stanford Univ., Calif.). *Trans. Faraday Soc. 42B,* 173-80 [discussion, 196-7 (1946)]. Phase relationships and transformations in systems of purest soaps and hydrocarbons were studied. The studied soaps were the dilaurate, distearate, dioleate, dinaphthenate (av. mol. wt. of acid, 210), and monolaurate of Al, and the solvents were isooctane, heptane, cyclohexane, and benzene. Visual observation of the phases in evacuated glass tubes was supplemented by data obtained by x-ray diffraction, osmometry, viscosimetry, measurements on the McBain-Bakr sorption balance, and determinations of the mechanical properties. It was found that gels (i.e. discontinuous systems of crystalline soap, more or less swollen, and frequently intermeshed with sol or jelly) and jellies (i.e. one-phase, homogeneous, transparent, isotropic, elastic systems) bridge the gap between dry crystalline Al soaps and their sols in hydrocarbons. The jelly exists as a thermodynamically stable phase within a region between those in which the sol and the gel are the stable forms. The transformation points between the gel and jelly phases were found to depend on the physical form of the soap, the nature of the soap, the nature of the solvent, and the presence of impurities or additional agents. The gel-jelly transformation was reversed upon heating and cooling. Incomplete phase diagrams including unstable phases are given for some of the systems studied. (*Chem. Abs. 42,* 9208.)

Variability and inhomogeneity of aluminum dilaurate. Karol J. Mysels and James W. McBain (Stanford University, Calif.). *J. Phys. & Colloid Chem. 52,* 1471-81 (1948). Aluminum dilaurate, in its "original" modification as prepared, is a fine white powder of formula $AlOHL_2$. This may be changed by physical treatments into other modifications differing definitely in their properties, such as melting point, solution and swelling in hydrocarbons, and sharpness of x-ray diffraction pattern, yet having the same composition and the same Bragg spacings and being transformable into identical modifications.

The effect of water and other additives on the fiber structure of calcium soap grease. D. H. Birdsall and B. B. Farrington (California Research Corp., Richmond, Calif.). *J. Phys. & Colloid Chem. 52,* 1415-23 (1948). A series of micrographs of various types of greases were taken as the greases were progressively dehydrated. The results indicate that the fiber or crystalline structure in hydrated calcium soap greases disintegrates concurrently with the removal of water. The fiber disintegration leads in turn to the separation of soap and oil. Stearic acid and calcium acetate act as fiber builders in calcium soap greases but the fibers are radically different in size and shape from those in the hydrated grease. For effective structural stabilization calcium acetate or water must be present in molar concentrations approximately equal to or greater than that of the soap.

Thixotropic qualities of soap-hydrocarbon systems. C. J. Boner (Battenfeld Grease and Oil Corp., Kansas City, Mo.). *J. Phys & Colloid Chem. 52,* 1383-90 (1948). The changes in consistency of lubricating greases made from soap cations of different valencies were measured by determining penetrations by A.S.T.M. methods. Results showed that soap-mineral oil systems containing soap of monovalent metals are less thixotropic over short periods of time than systems containing soaps of di- and tri-valent metals with the reverse being true over longer periods of time.

PATENTS

NONDUSTING DETERGENT COMPOSITIONS. Sidney Eisenberger and Samuel Machlis (O. D. Chemical Corp.). *U. S. 2,455,050.* The method of rendering a detergent consisting of from 10 to 50% of alkyl naphthalene sulfonates, 10 to 50% of tetrasodium pyrophosphate, and 15 to 40% of an alkali-metal carbonate, non-dusting and free-flowing is by spraying the detergent mixture with a dilute aqueous dispersion of diethylene glycol stearate.

NONDUSTING SOAP COMPOSITION. Gilbert De Wayne Miles (Colgate-Palmolive-Peet Co.). *U. S. 2,456,437.* Dust fines in soap are prevented by spraying soap particles with an aqueous solution of a water-soluble organic material such as starch, gum or glue, and drying the sprayed soap particles to non-tacky conditions.

CONTINUOUS MANUFACTURE OF SOAP. Sharples Corp. *British 608,943.* Soap is manufactured by continuous saponification of fat, followed by graining of the resulting soap and separating the grained soap from the aqueous reagent solution by centrifuging. In order to prevent formation of emulsions of soap and reagent, a specially designed centrifuge containing compartments for progressive passage of the mixture is described.

PREPARING SOAP IN THE COLD. Andre Razis. *French 863,296.* The mixture of the fat and alkali is emulsified by violent stirring. The saponification proceeds quickly and without external heating. An apparatus is described. (*Chem. Abs. 42,* 9210.)