ABSTRACTS . . . . R. A. Reiners, Editor

• Oils and Fats

S. S. Chang, Abstractor
Sin'itiro Kawamura, Abstractor
Dorothy M. Rathmann, Abstractor

Infrared spectra of the higher fatty acids and their significance for the problem of montanic acid. W. Fuchs (Tech. Hochschule, Aachen, Ger.). *Fette Seifen Anstrichmittel* **58**, 3–7 (1956). The infrared spectra of several higher fatty acids of 20 to 26 carbon atoms were studied in the range of 7.6–8.7 μ. The mean frequency distance of characteristic peaks was shown to be a linear function of the number of carbon atoms in the acid chain. Each carbon contributes a decrease of 0.0045 μ to the mean frequency distance. An application of these findings to the analysis of montanic acid may resolve the question of its odd- or even-numbered carbon chain. (*C. A.* **50**, 9761)

A process for the splitting of fat and simultaneous increase of solid fatty acids. G. Rankov and D. Chobanov (Bulgar. Akad. Wiss., Sofia). *Compt. rend. acad. bulgare sci.* **8**(2), 49–52 (1955). Black powered Se suspended in olive oil or beef tallow was heated in an autoclave for 4 hours at 220–5° and 24–6 atm. pressure. After cooling to normal temperature the fatty compound which floated on the water in solid form was melted and filtered. The Se residue can be reused. (*C. A.* **50**, 10425)

Bleaching fats and oils. F. Wittka. *Seifen-Ole-Fette-Wachse* **81**, 752–5 (1955). A review with 36 references.

Paper chromatography of phospholipides. Mitsuo Rikimaru, Yoshio Tanaka, and Minoru Hoshino (Fukushima Med. Coll.). *Fukushima J. Med.* **2**, 131–3 (1955). Paper chromatography of lysolecithin and the lecithins was studied with the use of various developing solvents. Best results were obtained with a solvent composed of a mixture of butyl alcohol, glycerol, and water. Paper chromatography failed to separate lysolecithin from lecithin of egg yolk, as the R_f values were approximately the same. (*C. A.* **50**, 13156)

Acetoglycerides. Z. F. Lashkari (Univ. Bombay). *Bombay Technologist* **6**, 61–4 (1956). Synthesis, properties, and applications are discussed. (*C. A.* **50**, 13119)

Polarographic investigations of gossypol. I. Polarographic determination of gossypol. A. L. Markman and S. N. Kolesov. *Zhur. Priklad. Khim.* **29**, 242–52 (1956). Gossypol in a solution of absolute acetone containing 0.5 *N* hydrochloric acid blown for 40 minutes with hydrogen to eliminate traces of oxygen gave a well-defined wave, $E_{1/2} = -0.45$ v., the height of which was proportional to the concentration of gossypol. Solutions of gossypol in 0.25 *N* sodium hydroxide blown for 30 minutes with hydrogen gave a well-defined polarographic wave, $E_{1/2} = -1.75$ v. This wave is characteristic of gossypol only. (*C. A.* **50**, 12760)

Preparation of activated vegetable carbons for bleaching oils. K. Krishnamurthy and M. Narayana Rao (Central Food Technol. Research Inst., Mysore). *Bull. Central Food Technol. Research Inst., Mysore* **4**, 208–9 (1955). The raw materials used were saw dusts from honne, teak, tadasil, silver oak, and burga, peanut and cottonseed hulls, and rice husks. All the material was first ground to 40 mesh and then activated with either calcium oxide or zinc chloride. In the case of rice husks, the material was first digested with sodium hydroxide and then activated with zinc chloride. (*C. A.* **50**, 13410)

The Tortelli-Jaffe reaction. Futara Ono and Yoshiyuki Toyama (Nagoya Ind. Sci. Research Inst.). *Research Rept. Nagoya Ind. Sci. Research Inst.* **8**, 50–2 (1955). Liver oil of *Theragra chalcogramma* and its methyl ester give a green color with the Tortelli-Jaffe test. The methyl ester of highly unsaturated acid from sardine oil is also positive in the test. Methyl esters of linseed and soybean oil show green color although there is a definite induction period in the reaction. Ethyl linolenate and its isomerized fatty acid behave similarly. It is concluded that the Tortelli-Jaffe reaction is not necessary characteristic for fish oil. The coloration would be due to converted products of ethylenic acids. (*C. A.* **50**, 13477)

Viscosity of sunflower and soybean miscella. V. V. Beloborodov. *Masloboïno-Zhirovaya Prom.* **21**(3), 11–13 (1956). Two experimental diagrams relating to dynamic viscosities of respectively sunflower and soybean benzene-miscella mixtures to their concentration and temperature were prepared for the oil-mill machine industry. Computation of kinematic viscosity from the diagrams and densities of miscella by means of a formula is discussed. (*C. A.* **50**, 13477)

Storage of oil-rich sunflower seeds in elevator bins. V. M. Kopeikovskii, V. G. Shcherbakov, and Ya. S. Meerov (Inst. Food Ind. and Oil-Fat Combine, Krasnodar). *Masloboïno-Zhirovaya Prom.* **21**(3), 5–7 (1956). Losses of oil-rich (40% and above) sunflower seeds caused by respiration and heating during their prolonged storage in seed bins were prevented when the moisture content of seeds was reduced to 7.0–7.5% prior to storage. (*C. A.* **50**, 13477)

Continuous hydrogenation of rape oil. A. M. Zharskiĭ. *Masloboïno-Zhirovaya Prom.* **21**(3), 19–22 (1956). The quality of hydrogenated oil was greatly improved when crude oil was preliminarily refined either with sulfuric acid and alkali, or with alkali and bleaching earths. Hydrogenation was accomplished with 1–1.2 kg. per ton reused catalyst at 200–5° in a first autoclave and with 0.9–1.0 kg. per ton of fresh catalyst in subsequent autoclaves, and recirculation of hydrogen only from second and third autoclaves. (*C. A.* **50**, 13477)

Preparation of erucic acid from rapeseed oil. H. Hardorn and K. W. Biefer (Lab. VSK, Basel, Switz.). *Mitt. Lebensm. Hyg.* **47**, 84–6 (1956). The method is based on saponification, extraction of unsaponifiable constituents with ether, release of fatty acids with hydrochloric acid and two recrystallization from 80% ethanol. The yield was 5–7 g. pure erucic acid from 100 g. oil. (*C. A.* **50**, 13477)

Investigation on oil turnips and oil rape. VI. Further investigations in chemical composition. N. Hellström (Roy. Agr. Coll., Uppsala, Sweden). *Acta Agr. Scand.* **6**, 17–44 (1956). Harvested oil turnip and oil rape leaves and roots were analyzed at four different times during the winter season and the results were related to date of harvest. (*C. A.* **50**, 13477)

Rice-bran oil by solvent extraction with alcohol. Y. K. Raghunatha and R. G. Khrishna Murthy (Central Food Technol. Research Inst., Mysore). *Bull. Central Food Technol. Research Inst., Mysore* **4**, 205–8 (1955). The green oil extracted from bran by alcohols had the following constants: d_{25} 0.916, n_{25} 1.469–1.470, iodine value 98–104, saponification value 174–184, unsaponifiable matter 3.4–5.4%, titer 29°, and tocopherol 0.029–0.163%. The crude brown wax separated from the bran oil (2–6% of the oil) was fractionated into a low- and a high-melting wax having the following characteristics, respectively: m.p. 35–55°, 80–83°; iodine value 67, 20; and saponification value 115, 109. (*C. A.* **50**, 13477)

Rapid estimation of the oil content of oilseeds. A. R. S. Kartha and A. S. Sethi (Indian Agr. Research Inst., New Delhi). *J. Sci. Ind. Research (India)* **15B**, 102–3 (1956). Extraction of oilseeds with petroleum ether and with purified sulfuric ether is compared. The cold percolation method can be satisfactory carried out with sulfuric ether as solvent. If only the oil content of the seeds is to be determined the petroleum ether method would be used. When the extracted oil is to be used for further tests sulfuric ether may be used for extraction, and the oil residue may be used for iodine value determination, or the oil may be used for determnation of free tocopherol. (*C. A.* **50**, 13476)

Protein denaturation in oil-extraction process. K. E. Leont'evskii and E. Yu. Fal'k. *Masloboïno-Zhirovaya Prom.* **21**(3), 13–4 (1956). Denaturation of the albuminous matter during the oil-extraction process by thermo-mechanical forces is discussed. (*C. A.* **50**, 13475)

Wool fat. E. I. Garlinskaya. *Masloboïno-Zhirovaya Prom.* **21** (3), 26–9 (1956). Wool fat is discussed with regard to physical constants, and preparation and application of derivatives therefrom. (*C. A.* **50**, 13473)

Electron-microscopic study of nickel catalysts for fat hydrogenation. S. Yu. Elovich and I. I. Tret'yakov. *Kataliticheskoe Gidrirovanie i Okislenie, Akad. Nauk Kazakh. S. S. R. Trudy Konf.* **1955**, 218–32. The most common particle size in nickel-copper catalyst is about 1 μ, with the metal coating the diatomite carrier like a sheath; distribution curves of particle size indicated that there is no substantial difference between 2 specimens which had been used 4 hours and 6.5 hours respectively. The specimen carried on diatomite showed a much larger available active surface than one without a carrier support. (*C. A.* 50, 13474)

Selectivity and radical exchange in catalytic hydrogenation of fats. S. Yu. Elovich. *Kataliticheskoe Gidrirovanie i Okislenie Akad. Nauk Kazakh. S. S. R., Trudy Konf.* **1955**, 204–17. Hydrogenation of the unsaturated linkages of cottonseed oil is attended with interesterification among various triglycerides. With active nickel catalysts at elevated temperature the product approaches randomness of the various acyl radicals in the glycerides; the initial location of radicals on terminal or middle carbon atoms of the glycerol unit does not affect the redistribution. (*C. A.* 50, 13474)

Suitability of urea separation for the isolation and determination of higher fatty acids. A. Holasek and F. Sadek(Univ. Graz, Austria). *Fette u. Seifen Anstrichmittel* **56**, 604(1954). The method is practical for use with acid petroleum ether extracts of saponified biological extracts where it can be used for the separation of the C_{16} and C_{18} acids from the lower fatty acids. (*C. A.* 50, 13475)

Laboratory fractionation with superheated steam, with particular emphasis on the separation of fatty acids. II. H. Stage, R. Bünger, and A. Jones(Fa. Distillationstech. Dr. Hermann Stage, Cologne-Niel, Ger.). *Fette u. Seifen Anstrichmittel* **55**, 580–3(1953). A discussion with diagrams of equipment. (*C. A.* 50, 13475)

Paper chromatography in the fat field. XVIII. Separation of hydroxylated and brominated fatty acids. H. P. Kaufmann and W. H. Nitsch(Univ. Münster, Ger.). *Fette u. Seifen Anstrichmittel* **58**, 234–8(1956). Paper partition chromatography is applied to the separation of hydroxy acids from stearic acid, of the isomeric hydroxystearic acids from each other, of elaidic acid from ricinelaidic acid, of mixtures of polyhydroxy acids, and of polybromo acids. A hydrocarbon fraction, b.p. 190–220°, is used as the stationary phase, and dilute acetic acid as the mobile phase. The ratio of the R_f value to that of a standard such as myristic acid is calculated to eliminate variations caused by differences in properties of the chromatographic paper. (*C. A.* 50, 13475)

Direct estimation of saturated acids in small amounts of fats or mixed fatty acids. A. S. Sethi and A. R. S. Kartha(Indian Agr. Research Inst., New Delhi). *J. Sci. Ind. Research(India)* **15B**, 103–5(1956). Amount of fat required for estimation of saturated acids can be lowered to about 0.5 to 1.0 g. An amount of fat capable of yielding 100–150 mg. of saturated acids appears to be the optimum quantity, but with suitable precautions the method can be scaled down to 15–30 mg. With the present method, the same yield of saturated fatty acids is obtained from mixed fatty acids from the fats as when the neutral fats are directly oxidized. (*C. A.* 50, 13475)

Low temperature hydrogenation of cottonseed oil on nickel-chrome catalyst. D. V. Sokol'skiĭ and E. G. Bolkhovitina(Kazakh State Univ., Alma-Ata). *Katalitícheskoe Gidrirovanie i Okislenie, Akad. Nauk Kazakh. S. S. R., Trudy Konf.* **1955**, 193–203. Nickel-chrome catalysts with or without a support can be used for hydrogenation of cottonseed oil at 120–60°; this is 70–100° below the usual practice for nickel-copper catalyst used in the U.S.S.R. This catalyst without carrier support can also be used 10–15 times. (*C. A.* 50, 13476)

Branched chain fatty acids of mutton fat. 3. The isolation of 16-methylheptadecanoic acid (isostearic acid). R. P. Hansen, F. B. Shorland, and N. J. Cooke(Fats Res. Lab., Wellington, New Zealand). *Biochem. J.* **64**, 214–216(1956). Hydrogenated mutton fat has been found to contain trace quantities of 16-methylheptadecanoic(*iso*stearic) acid. The amount present represented not less than 0.05% of the total fatty acids.

The volatile fatty acids of bovine-muscle and -liver phospholipids. J. C. Hawke(Fats Res. Lab., Wellington, New Zealand). *Biochem. J.* **64**, 311–318(1956). Animal lipids have been separated into glycerides and phospholipids by acetone precipitation and chromatographic methods. It has been shown by means of gas-liquid chromatography that the volatile fatty acids comprise 0.68 and 1.28 mole % of the total fatty acids in bovine muscle and bovine-liver phospholipids, respectively. In muscle phospholipids all the normal acids from C_1 to C_8, except C_7, have been detected. In addition, isovaleric acid was present. All the normal acids from C_1 to C_9, and, in addition, isobutyric, isovaleric, and α-methylbutyric acids have been detected in liver phospholipids.

Hydrolysis of glycerolphosphatides by plastid phosphatidase. C. M. Kates(Nat. Res. Council, Ottawa, Can.). *Can. J. Biochem. & Physiol.* **34**, 967–980(1956). Studies of the influence of structural variation in the glycerolphosphatide molecule on the hydrolysis of this class of compound by plastic phosphatidase C showed that the presence of both fatty acid ester groups is necessary for enzymatic reaction; that release of nitrogenous bases occurred, in the presence of ethyl ether, from phosphatidyl cholines, phosphatidyl ethanolamine, and phosphotidyl serine; and that a phosphatidyl choline was hydrolyzed more rapidly than the corresponding phosphatidyl ethanolamine or phosphatidyl serine. The rate of hydrolysis of phosphatidyl choline was influenced strongly by the chain length, and degree of unsaturation of the fatty acids. The phosphatidic acids were isolated upon treatment of several lecithins by carrot phosphatidase C. Studies on hydrolysis of crude soybean phosphatide by phosphatidase C showed both choline and ethanolamine were liberated in the absence of ethyl ether, at an optimum pH of 4.8; in the presence of ether, the rate of liberation of each base was increased, with the pH optimum between 4.8 and 6.

Urea adducts with fatty compounds. X. Adducts with some polyalcohol monoesters. J. M. Martinex Moreno, J. Ruiz Cruz, and C. Janer. *Grasas y Aceites* **7**, 147–149(1956). The urea adducts with normal saturated monoglycerides and glycol monoesters from C_7 to C_{18} acids were prepared and their composition determined. It is shown that there is considerable similarity of these compounds with other adducts of the cetane-urea type.

Periodate-permanganate oxidations. V. Oxidation of lipids in media containing organic solvents. E. von Rudloff(Prairie Regional Lab., Saskatoon, Saskatchewan). *Can. J. Chem.* **34**, 1413–1418(1956). The periodate-permanganate reaction with methyl oleate and triolein has been studied in media containing a variety of organic solvents. The oxidation proceeded favorably in media containing tertiary butyl alcohol or pyridine and conditions have been found which permit the quantitative analysis of unsaturated lipids.

Trace elements in edible fats. III. Some applications of Weisz's "annular stove" micro-technique. A. Vioque. *Grasas y Aceites* **7**, 195–201(1956). A description is given of Weisz's "annular stove" micro-technique and of its applications to the determination of metallic traces in edible fats. Detection and semi-quantitative determinations of iron directly in olive oil are also possible by this technique.

Experimental extraction plant: report of organizing committee of the second experimental campaign (1955-56). *Grasas y Aceites* **7**, 133–146(1956). The results obtained on the studies during the second experimental campaign are given. The rates and qualities of oil obtained are compared taking the classical system of extraction as the standard and comparing the new centrifugal machines being tested in the plant. These new machines were the "Molinetto," "Molinova," and "Centrifugal Separator" from the firm Pieralisi from Jesi (Italy), the supercentrifuge DeLaval, and the supercentrifuge "Aurolea."

Flue-cured tobacco. I. Isolation of solanesol, an unsaturated alcohol. R. L. Rowland, P. H. Latimer and J. A. Giles(Res. Dept., R. J. Reynolds Tobacco Co.). *J. Am. Chem. Soc.* **78**, 4680–4683(1956). A low-melting unsaturated alcohol has been isolated from flue-cured tobacco in quantities corresponding to 0.4% of the dry weight of the leaf. The compound has been isolated from tobacco in three different stages of treatment, indicating that the leaf content of this alcohol does not change significantly during the processing of tobacco. Structural studies have indicated that the alcohol is 3,7,11,15,19,23,27,31,-35,39-decamethyl-2,6,10,14,18,22,26,30,34,38-tetracontadecaene-1-ol.

Report on total solids and ether extract in fish and other marine products. H. M. Risley(Food & Drug Admin., Dept. Health. Education & Welfare, Seattle 4, Wash.). *J. Assoc. Official Agr. Chemists* **39**, 603–7(1956). Collaborative studies are reported on a first action method for total solids in fish and other marine products, and on a rapid sorting method for ether extract in canned fish. The precision of this ether extract method is not as good as that of the Official Method. The rapid sorting method is suggested for use only when large numbers of samples must be examined and the fat content varies widely from sample to sample.

Comparison of methods for determining water insoluble acids (WIA) in butter. L. G. Ensminger(Food & Drug Admin., Dept. Health, Education & Welfare, Cincinnati 2, Ohio). *J. Assoc. Official Agr. Chemists* **39**, 769–72(1956). A revised Ensminger procedure for estimating WIA in butter is described. The major change from the original procedure is the introduction of a washing of the butter with hydrochloric acid in order to convert water-soluble fatty acid salts to the insoluble fatty acids. This acid-wash corrects for the low recoveries previously found with heavily neutralized butters. Two short methods (revised Ensminger and Hillig rapid method) gave higher average recoveries of WIA on 17 churns of butter than did the Official method. In general, agreement between replicate determinations was fair to excellent.

Filtration-extraction process achieves commercial status. E. A. Gastrock(S. Regional Res. Lab., New Orleans, La.). *Soybean digest* 16(12), 18–20(1956). The stages in the filtration-extraction process for the production of soybean and cottonseed oils are reviewed briefly.

Solvent segregation of vegetable oils. II. Safflower oil. G. K. Joshi, D. Rebello, and S. M. Shah(Dept. Chem. Technol., Univ. Bombay). *J. Applied Chem.* 6, 281–3(1956). The composition of safflower oil is summarized. Attempts to fractionate this oil by solvent segregation in furfural or furfural-hexane mixtures were unsuccessful.

Ternary liquid equilibria: water-fatty acid-solvent systems. M. Raja Rao and C. Venkata Rao(Chem. Engr. Research Labs., Dept. Chem. Technol., Andhra Univ., Waltair, S. India). *J. Applied Chem.* 6, 269–76(1956). Phase equilibrium data at 31° are reported for ternary systems of water and propionic acid with each of the following solvents: *n*-hexane, cyclohexane, cyclohexene, toluene, and tetrachloroethylene.

Recovery of wool wax. L. F. Evans, W. E. Ewers and C. Simpson(Commonwealth Scientific and Industrial Research Organization). *U. S. 2,765,081.* A process is described for the separation of wool wax from wool scour liquids by froth flotation.

Method of cooking comestibles. H. L. Smith, Jr.(H. W. Lay & Co., Inc.). *U. S. 2,767,095.* During deep-fat frying, fat is continuously circulated through a heated zone where it is deaerated before being returned to the kettle.

Method of treating food animals. O. E. Schotté(Trustees of Amherst College). *U. S. 2,767,096.* Freshly slaughtered food animals are bled and at least a portion of the viscera is removed in such a manner as to avoid substantial damage to the arteries. These arteries are then blocked, and melted edible fat (having a melting point above 75°F.) is injected under pressure into a major artery so that the fat infuses and permeates a substantial portion of the carcass.

Alcoholysis of glycerides. R. R. Coats, A. W. C. Taylor and J. G. M. Bremner(Imperial Chemical Industries Ltd.). *Brit. 748,401.* Improved quality and yields of glycerol and esters of monohydric alcohols are obtained by alcoholysis of the glycerides in an inert liquid which is a solvent for the glyceride and the alcohol, but is immiscible with glycerol. The suitable diluents are tetrahydronaphthalene, petroleum hydrocarbons b.p. 149–95°, kerosine, naphthenes b.p. 150–250°, chlorinated hydrocarbons, and aromatic nitro compounds. (*C. A.* 50, 13481)

Hydrolysis of fats and oils. G. Antignano. *Ital. 484,620.* A process yielding 97–8% fatty acids and almost complete glycerol recovery is described. Preheated water is percolated through the charge in the autoclave maintained at the desired temperature and pressure. The amount should be equal to about half the weight of the charge and the contact time should be about 5 hours for 10 atmospheres pressure. A constant-level device regulates the introduction of water and the discharge of glycerol-containing water. (*C. A.* 50, 13481)

FATTY ACID DERIVATIVES

Some fatty acid derivatives of D-glucosamine. Y. Inouye, K. Onodera, S. Kitaoka, and S. Hirano(Biochemical Lab., College of Ag., Kyoto Univ.). *J. Am. Chem. Soc.* 78, 4722–4724(1956). Some N-acyl and N-acyl-tetra-O-acyl-derivatives and some mixed acyl compounds of D-glucosamine (2-amino-2-deoxy-D-glucose) were prepared by the action of the acid anhydrides and acid chlorides. The acyl groups used were those of the even-numbered saturated fatty acids. The N-acyl-D-glucosamines prepared exhibited the identical absorption maxima in the Morgan and Elson reaction.

Methods of preparation, fatty acid esters of sucrose. L. Osipow, F. D. Snell, W. C. York, and A. Finchler(Foster D. Snell, Inc., 29 West 15th St., New York 11, N. Y.). *Ind. Eng. Chem.* 48, 1459–1462(1956). Raw materials for these versatile new esters are inexpensive and plentiful. A promising process involves reaction of sucrose monoester with excess methyl ester to form a high level polyester. Addition of solvent and excess sugar gives the monoester in good yield.

Use of hydrazine as a reducing agent for unsaturated compounds. I. Hydrogenation of oleic acid. F. Aylward and C. V. Narayana Rao(Dept. Chem. & Food Technol., Borough Polytechnic, London, S. E. 1). *J. Applied Chem.* 6, 248–52(1956). A solution of 5 g. oleic acid in 50 ml. absolute ethanol was reacted with hydrazine in Pyrex-glass equipment. The effects of reaction temperature, degree of agitation, molar ratio of oleic acid and hydrazine, and hydrazine concentration on the rate of reaction were studied. When the reaction mixture was well-agitated at a temperature of 50°, 93% of the oleic acid was reduced to stearic acid in 6 hours.

Gear oil lubricants. J. B. Stucker, N. D. Williams, and G. Wolfram(The Pure Oil Co.). *U. S. 2,764,550.* A lubricating composition having extreme pressure characteristics is prepared by mixing a mineral lubricating oil, a sulfurized-phosphorized fatty material, and a phenol extract.

Acetylated hydroxy derivatives of fatty acids. J. Rockett(Arnold, Hoffman & Co., Inc.). *U. S. 2,764,604.* Acetylated derivatives of hydroxy aliphatic acids are obtained by the reaction of a solution of relatively long chain (up to C_{18}) unsaturated fatty acids in a lower aliphatic monocarboxylic acid with one to three mols of paraformaldehyde for each molar equivalent of double bonds.

Method of making mixed diglycerides. N. D. Embree and G. Y. Brokaw(Eastman Kodak Co.). *U. S. 2,764,605.* A fatty triglyceride is reacted, in the presence of a basic transesterification catalyst, with glycerine and an acylated glycerine in which the acyl groups each contain 2 to 6 carbon atoms. The reaction product is a mixture containing a glyceryl partial ester in which there is a free hydroxyl group, an acyl radical and a fatty acid radical.

Transparentized paper. B. F. Aycock and L. E. Kelley(Rohm & Haas Co.). *U. S. 2,765,243.* Paper is transparentized by impregnation with a solution containing at least 40% of the following mixture: 55 to 75 parts by wt. of C_8–C_{24} monohydric alcohol or monoglycerides of C_8–C_{24} fatty acids, and 45 to 30 parts by wt. of a methylolated urea in which hydroxyl groups have been partially alkylated with methyl, ethyl, or isopropyl groups. The impregnated paper is subsequently heated at temperatures between 120° and 250°F. until superficial tackiness has been eliminated and the alcohol has reacted with the urea derivative.

Nail polish remover and cuticle softener. J. M. Blackburn. *U. S. 2,765,257.* The combined nail polish remover and cuticle softener is a mixture of 95 to 60% of a solvent and 5 to 40% of sulfonated mineral oil. The preferred solvent contains 60 to 90% of acetone and butyl acetate, 5 to 15% dibutyl phthalate and 5 to 25% of butylacetyl ricinoleate.

Bath for plating bright gold. B. D. Ostrow and F. I. Nobel. *U. S. 2,765,269.* A cyanide plating bath is improved by the addition of a product prepared by the condensation of a C_8–C_{18} fatty acid with an amino acid.

Esterification of acids. P. F. Bruins and R. C. Canapary(Chas. Pfizer & Co., Inc.). *U. S. 2,766,273.* A process is described for the reaction of a carboxylic acid with an alkanol under pressure at temperatures between 100° and 300°.

Preparation of guanidino substituted fatty acids. R. G. Garst and B. Vassel(International Minerals & Chemical Corp.). *U. S. 2,766,282.* Guanidino substituted fatty acids are obtained by the reaction of a guanidine acid addition salt, an alkali metal hydroxide and an α-chloro- or α-bromo-fatty acid in an aqueous medium containing not more than 15 moles of water for each mole of guanidine salt.

Partial fatty acid esters of alkitol anhydrides and a dimeric acid, as corrosion inhibitors. R. I. Gottschall and R. T. Kern, Jr.(Gulf Oil Corp.). *U. S. 2,767,144.* An acid ester, useful as a corrosion inhibitor, is prepared by the reaction of a dimeric acid derived from a di- or triunsaturated C_6 to C_{22} fatty acid with a partial ester of a C_{14} to C_{24} fatty acid and a C_4 to C_6 alkitol anhydride. The resulting acid ester contains at least one carboxyl group in the molecule.

Fatty acids. P. Water and Societe d'etudes techniques et industrielles(S.E.T.I.). *Fr. 992,559.* Fatty acids and saponifiable products are obtained by treating saturated or unsaturated hydrocarbons with an oxidizing gas mixture, e.g., ozone, ozonized air, or with a mixture of ozone, nitrogen, and chlorine in any proportion. Optionally, the reaction may be completed by the use of heat or catalysts. Similarly, active groups may be formed by this treatment in mineral oils and fats which improves their lubricating properties. (*C. A.* 50, 13482)

• Biology and Nutrition

F. A. Kummerow, Abstractor
Joseph McLaughlin, Jr., Abstractor

Oxidation of fats by plant lipoxidases and fatty acid dehydrogenases. I. H. Frehse and W. Franke(Univ. Cologne, Ger.).

Fette Seifen Anstrichmittel 58, 403–8(1956). A review with 61 references. (*C. A.* 50, 13118)

The biosynthesis of cholesterol from acetate-1-C^{14} by cellular fraction of rat liver. Nancy L. Bucher and Kathleen McGarrahan(Collis P. Huntington Hos. of Harvard Univ., Massachusetts General Hospital, Boston). *J. Biol. Chem.* 222, 1–15 (1956). For the biosynthesis of cholesterol from acetate to occur *in vitro,* both microsomes and soluble cell constituents are required. Other cellular structures are not necessary. *In vivo,* over 90 per cent of newly formed cholesterol obtained at short time intervals after the injection of labeled acetate is in the microsomal fraction. The microsomes contain over 80 per cent of the total cytoplasmic cholesterol. Within the microsomes, the larger lipide-rich membranes or vesicular structures, or other elements still unidentified, rather than the smallest granules or ribonucleoprotein particles, appear to be the most probable locus of the cholesterol-forming enzymes.

A comparison of the biological values of dietary protein incorporated in high- and low-fat diets. V. Chalam Metta and H. H. Mitchell(Division of Animal Nutrition, University of Illinois, Urbana). *J. Nutrition* 59, 501–513(1956). When fed in isocaloric amounts, dietary fat and carbohydrate have essentially the same effect on protein utilization in both the protein-depleted rat and the growing rat. Neither the apparent digestibility nor the true digestibility of casein is improved by the higher dietary fat level. Fat does not seem to spare endogenous nitrogen under conditions of satisfactory and equal caloric intake.

The conversion of cholesterol -4-C^{14} to acids and other products by liver mitochondria. D. S. Fredrickson(National Heart Institute of Health, Bethesda, Maryland). *J. Biol. Chem.* 222, 109–120(1956). Cholesterol-4-C^{14} has been incubated with a cell-free preparation from mouse liver which has previously been shown to oxidize the terminal carbon of cholesterol to CO_2. The products of the degradation of ring-labeled substrate have been separated and partially characterized. Cholesterol is converted to at least four separate acids by the liver mitochondria. Two of these acids are similar to, but not identical with, cholic acid and deoxycholic or chenodeoxycholic acid. A ketonic acid and at least one digitonin precipitable acid are also produced.

The function of cytidine coenzymes in the biosynthesis of phospholipides. E. P. Kennedy and S. B. Weiss(Ben May Lab. for Cancer Research and the Dept. of Biochem., Univ. of Chicago, Chicago, Illinois). *J. Biol. Chem.* 222, 193–214(1956). The enzymatic synthesis of lecithin and of phosphatidylethanolamine has been found to be mediated by cytidine coenzymes. Cytidine diphosphate choline and cytidine diphosphate ethanolamine, activated forms of phosphorylcholine and phosphorylethanolamine, are precursors of lecithin and phosphatidylethanolamine, respectively, in these enzyme systems.

Geometrical isomerization of vitamin A, retinene and retinene oxime. Ruth Hubbard(Biological Lab., Harvard University). *J. Am. Chem. Soc.* 78, 4662–4667(1956). Stereoisomerization experiments have been performed with geometrical isomers of vitamin A, retinene and retinene oxime. These permit comparisons of the isomerization of mono-*cis* and di-*cis* forms, of unhindered and hindered *cis* linkages, and of the effects of terminal $-CH_2OH$, $-\underset{|}{C}=O$ and $-\underset{|}{C}=NOH$ groups.

An increased incorporation of P^{32} into nucleic acids by vitamin E-deficient rabbits. J. S. Dinning, J. T. Sime and P. L. Day (Dept. of Biochem., School of Medicine, Univ. of Arkansas, Little Rock, Arkansas). *J. Biol. Chem.* 222, 215–217(1956). Vitamin E deficiency in the rabbit leads to a marked increase in the incorporation of P^{32} into tissue nucleic acids.

Observations on the composition of the subcutaneous fat of the white leghorn chick embryo. R. D. McGreal(Dept. of Zoology, State College of Washington, Pullman, Wash.). *Poultry Sci.* 35, 1066–1069(1956). Between the 14th and 20th days of incubation the ether extractable lipid of the lateral abdominal fat body increases more than eightfold. During this period the mean iodine number is 73.5 with no significant variation as a function of time of incubation; the mean saponification number was 198, also with no significant variation. It appears that as early as the fourteenth day, and for the remainder of the incubation period, the embryo deposits subcutaneous fats whose saponification number is very similar to that of fat deposited by adult chickens.

The relation of serum cholesterol to the physical measurements and diet of women. Lillian C. Butler, Marian T. Childs and Alice J. Forsythe(Dept. of Home Ec., College of Ag., University of Illinois, Urbana). *J. Nutrition* 59, 469–478(1956). Significant positive correlations for age and relative body weight but a negligible correlation for the diastolic blood pressure with the total serum cholesterol was found. The percentage of dietary fat and protein calories as well as the total energy intake did not show a significant relationship with the variation in total blood cholesterol.

Sparing of palmitic acid oxidation by carbohydrate: prefeeding versus addition to medium. W. J. Lossow, G. W. Brown, Jr., and I. L. Chaikoff(Dept. of Physiology of the Univ. of Calif., School of Medicine, Berkeley, Calif.). *J. Biol. Chem.* 222, 531–535(1956). Emulsions containing the triglyceride of palmitic acid-1-C^{14} were injected into fasted rats and rats previously fed carbohydrate by stomach tube. Liver slices prepared from these rats were incubated in the absence and in the presence of glucose in the incubation medium. The *added* glucose did not spare the oxidation of the palmitic acid. The oral administration of glucose did result in a pronounced reduction in the conversion of labeled palmitic acid to both CO_2 and acetoacetate by liver slices. These findings support the view that carbohydrate utilization regulates the catabolism of long chain fatty acids.

A study of blood and urinary vitamin concentrations and of fat balance in the rhesus monkey. J. E. D. DeOliveira, J. A. Coniglio, K. P. Misra, W. N. Pearson, J. Ann Efner and W. J. Darby(Dept. of Biochem. and Division of Nutrition, Vanderbilt Univ., School of Medicine, Nashville, Tenn.). *J. Nutrition* 59, 515–526(1956). With 5% fat in the diet only 2.8 to 8.5% of the ingested fat was lost in the feces. The fecal fat concentration ranged from 6.1 to 13.4% of the dry weight of the feces. Because of the variation in fecal fat loss in an individual monkey from one collection period to another, a long balance period is a more reliable index of fat absorption than a short-time study.

Fatty acid inhibition of cholesterol synthesis. J. D. Wood and B. B. Migicovsky(Chem. Div., Sci. Service. Dept. Agr., Ottawa, Can.). *Can. J. Biochem. & Physiol.* 34, 861–868(1956). Fatty acids inhibit cholesterol synthesis by rat liver homogenates. Inhibition occurs with acids containing either an even or an odd number of carbon atoms in the chain, and with saturated and unsaturated acids, the inhibition increasing with the degree of unsaturation of the acid. In the case of acids with an even number of carbon atoms the inhibition increases with chain length to a maximum at 12 carbons after which a rapid decrease occurs. The presence of fatty acid during cholesterol synthesis increases the acetate incorporated into fatty acids to a slight extent. This increase is small compared with the decrease in the amount incorporated into cholesterol. A possible mechanism for the inhibition is discussed.

Lack of effect of dietary choline on cholesterol adsorption in rat. E. H. Rice, G. F. Hungerford, and W. Marx(Dept. Biochem., Univ. of Southern Calif., Los Angeles). *Proc. Soc. Exptl. Biol. Med.* 92, 754(1956). The effect of dietary choline on the intestinal absorption of cholesterol was studied by 2 different technics. The results indicate that under the conditions of these experiments, choline did not influence cholesterol absorption.

Dietary protein and serum cholesterol in rats. A. W. Moyer, D. Kritchevsky, J. B. Logan, and H. R. Cox(Viral & Rickettsial Section, Res. Div., Am. Cyanamid Co., Lederle Labs., Pearl River, N. Y.). *Proc. Soc. Exptl. Biol. Med.* 92, 736(1956). Increasing the protein content of the diets of groups of rats on a normally hypercholesterolemic regimen (cholesterol plus cholic acid) caused a progressive drop in serum cholesterol values. This observation held true when either casein or Drackett protein was used. All diets except one contained added choline chloride. Animals on the choline-free diet had lower serum cholesterol levels and higher liver cholesterol levels than a comparable choline-fed group.

Effect of exposure to a cold environment on labeling of phospholipide in rat liver slices. Dorothy Kline, Catherine McPherson, E. T. Pritchard, and R. J. Rossiter(Dept. Biochem., Univ. of Western Ontario, London, Can.). *Proc. Soc. Exptl. Biol. Med.* 92, 756(1956). In rat liver slices respiring in a buffered medium containing suitable radioactive precursors, the acetone insoluble lipids were labeled metabolically. Exposure of the animals to environmental temperature of 4–5°C. for the 12 days prior to the experiment caused a decrease in the subsequent labeling of the phospholipide from acetate-1-C^{14}, but no significant change when inorganic P^{32} was the source of the radioactivity. Exposure of the rats to −5°C. for the 3 hours immediately prior to the experiment caused a decrease in the labeling of the phospholipide when the radioactivity was derived from acetate-1-C^{14}, but no change when it was derived from glycerol-1-C^{14}, glycine-2-C^{14} or inorganic P^{32}.

Erucic acid and cholesterol excretion in the rat. K. K. Carroll and R. L. Noble (Univ. of Western Ontario, London, Can.). *Can. J. Biochem. & Physiol.* 34, 981–991 (1956). Erucic acid has been found to increase the excretion of endogenously produced cholesterol in the rat with little change in cholesterol concentration in the carcass except to increased concentrations in the adrenals and liver. The fecal cholesterol was identified by m.p. and infrared spectrum after isolation by chromatography on alumina. It does not appear to originate in the liver since no increase was observed in the biliary excretion of cholesterol. Other homologues of oleic acid, eicosenoic and nervonic acid, produced similar changes in fecal cholesterol excretion but oleic acid had little effect. A series of saturated acids from C_4 to C_{22} were tested, and the longer chain members found to cause some increase in cholesterol excretion. Ester cholesterol accounted for much of the increases but varied greatly in the experiments with unsaturated fatty acids. A preparation of cerebrosides from beef spinal cord also increased the amount of cholesterol excreted in the feces.

Formation of fats in starch grains and plastids. D. I. N. Sveshnikova (Acad. Sciences, Moscow). *Research* 9, 396–402 (1956). Cytological studies are reported on the conversion of starch to fat in the stomata of iris, seeds of flax, mustard, sunflower, poppy and peanut. The conversion was found to be a gradual process. Transformation of starch into fat occurs in the chloroplasts and leucoplasts at a definite stage of fruit development. The nucleus apparently plays a significant role in this process.

The chemical estimation of vitamin-E activity in cereal products. IV. Epsilon-tocopherol. P. W. R. Eggitt and F. W. Norris (Dept. Applied Biochem., The University, Birmingham). *J. Sci. Food Agr.* 7, 493–511 (1956). Epsilon-tocopherol was isolated in 5-mg. batches from 180-g. portions of freshly milled bran and purified by partition chromatography with a stationary phase of liquid paraffin on kieselguhr made hydrophobic with dimethyldichlorosilane and a mobile phase of 75% aqueous ethanol. The absorption spectrum of epsilon-tocopherol and that of nitroso-epsilon-tocopherol were almost identical with the corresponding spectra for beta-tocopherol. Epsilon-tocopherol, when oxidized with the Emmerie-Engel reagent, yielded a tocopheroxide which could be converted into the isomeric epsion-tocopherylquinone. The latter had a characteristically shaped absorption like that of beta-tocopherylquinone. With nitric acid in ethanol epsilon-tocopherol formed a red *o*-quinone and other products with a reaction spectrum like that for beta-tocopherol. Only the beta- and epsilon-homologues produced a brilliant violet unstable color with nitric acid in chloroform. The reactions led to the conclusion that epsilon is 5-methyltocol. This structure was confirmed by the conversion of epsilon-tocopherol to 5:7-dimethyltocol under conditions which convert beta-tocopherol to alpha-tocopherol. Difficulties encountered in applying the Quaife nitrosation technique to the tocopherols are discussed. A factor of 96 is suggested for converting depth of color to concentration when epsilon-tocopherol is assayed by the modified Emmerie-Engel method.

Determining the depth of layers of fat and of muscle on an animal body. R. M. Whaley and F. N. Andrews (Purdue Research Foundation). *U. S. 2,763,935.* An apparatus is described which permits the determination of thickness of fat overlying muscle on an animal body by opening a passageway through the fat into the muscle, measuring the conductivity of the material along the walls of the passageway, and recording the depth at which a pronounced change in conductivity occurs.

Stabilized vitamin A compositions. H. Kläui (Hoffmann-La-Roche Inc.). *U. S. 2,764,520.* Vitamin A and its esters are stabilized by dispersal in a carrier containing an aliphatic primary C_8–C_{18} alkyl amine.

• Drying Oils and Paints

Raymond Paschke, Abstractor

Isobutyl alcohol and its esters in coatings. J. D. Crowley and T. E. Vance (Eastman Chemical Products, Inc. Kingsport, Tenn.). *Paint Manuf.* 26, 333 (1956). The use of isobutyl alcohol and its derivatives isobutyl acetate and di-isobutyl phthalate by substitution for the corresponding *n*-butyl derivative in coatings is described in this article which reviews the properties and applications of these materials, discusses their value to the manufacturer and suggests typical formulae.

Spectrophotometry in analysis of oils and fats. N. H. E. Ahlers (Unicam Instruments, Ltd.). *Paint Technol.* 20, 237 (1956). The application of ultraviolet, visible, and infrared absorption spectroscopy, Raman spectroscopy, and flame photometry as modern analytical techniques are described. Descriptions of modern instruments are included.

Some applications of colorimetry. B. M. Baker (Canadian Industries, Ltd., Toronto). *Paint Varnish Production* 46(10), 35 (1956).

The production of some synthetic resins. J. Benveniste (Resin Res. Labs., Inc.). *Paint Ind. Mag.* 71(9), 12 (1956). The application of alkyd, cellulosic, urea-formaldehyde, and vinyl resins in paints and varnishes in France is discussed.

The measurement and specification of colour. C. L. Boltz. *Can. Chem. Processing,* 40(9), 34 (1956). A critical examination of present colour systems in terms of their industrial utility.

Development of exterior coatings for wood. J. F. Brocker (E. I. du Pont Co.). *Paint Ind. Mag.* 70(7), 9 (1956).

Flushing of pigments. W. Dotzel. *Paint Oil Colour J.* 130, 592 (1956).

Degradation of novolak resins. E. G. E. Hawkins. *J. Appl. Chem.* 6, 139 (1956). An attempt has been made to determine the structure of novolak resins by controlled degradation.

Fire protection in the paint industry. W. Hyde. *Paint Oil Colour J.* 130, 647 (1956).

Some recent advances in surface chemistry. J. J. Kipling (Hull University, Eng.). *Oil Colour Chemists' Assoc. J.* 39, 641 (1956). Recent work on physical adsorption by solids from binary liquid mixtures is reviewed.

Wood finishes and wood finishing. A. E. Lain (Harris Lebus Ltd., London). *Oil Colour Chemists Assoc. J.* 39, 670 (1956).

Chromatographic investigation of disproportionated rosin. Virginia M. Loeblich and R. V. Lawrence (S. Utilization Res. Branch, New Orleans). *Paint Ind. Mag.* 71(9), 8 (1956).

Problems in the finishing of automobiles. R. J. Wirshing and Wardley D. McMaster (General Motors Corp.). *Paint Varnish Production* 46(10), 31 (1956). Problems arising from surface contamination, undercoats, and new finishes are discussed.

The protection of structural steel against atmospheric corrosion. W. G. B. Mills. *Paint Oil Colour J.* 130, 593 (1956).

Thixotropic alkyds. A. G. North (Cray Valley Products, Ltd., Kent, Eng.). *Oil Colour Chemists' Assoc. J.* 39, 695 (1956). Most conventional paint media such as drying oils, oleoresinous varnishes and the lower molecular weight alkyds can be regarded as Newtonian liquids. That is to say, their viscosity at a given temperature is independent of the rate of shear. Paints produced from these media may or may not behave as substantially Newtonian liquids, depending on the level and type of pigmentation, but practical paint formulation over the years has shown the desirability of introducing controlled "structure" (i.e., thixotropy or false body) into paints as a means of overcoming settling, improving brushability, etc. These practical findings have been backed up in recent years by rheological studies which have explained the advantages obtained in these systems and which have paved the way for new methods of achieving thixotropy and related effects. One of the newest of these methods is by means of alkyd resins or drying oils which are modified during processing to possess built-in thixotropic structure. This paper deals with the chemistry, manufacture, rheological properties and practical use of this new class of resins.

Spontaneous combustion and its early detection. A. S. Radford (The Minerva Detector Co., Ltd., Eng.). *Paint Technol.* 20, 317 (1956). An experimental investigation of the firing of organic waste soaked with linseed oil is described.

Aluminum tritallate—a promising new derivative of tall oil. J. Rinse (Chemical Research Associates, N. J.). *Paint Technol.* 20, 275 (1956). This paper won the second prize in the awards contest of the Tall Oil Division of the Pulp Chemicals Association in America. Aluminum tritallate is a new derivative of tall oil having great reactivity. It dries rapidly by partial hydrolysis and it combines with all hydroxyl compounds, the reaction products being stable aluminum diacylates useful in various technical applications.

Method for evaluating fungus growth on large areas. S. Shapiro (Materials Branch, Fort Belvoir, Va.). *Paint Varnish Production* 46(10), 41 (1956).

Craft and science in linoleum manufacture. O. V. Soane (Barry Ostlere, and Shepherd, Ltd., Eng.). *Oil Colour Chemists' Assn. J.* 39, 733 (1956).

How to make a simple "blister box." N. B. Tompkins(Dewey & Almy Chem. Co.). *Paint Varnish Production* **46**(10), 38 (1956).

The curing of butylated amino resins. H. R. Touchin(Brooklands, Sale, Chesire, Eng.). *Oil Colour Chemists' Assoc. J.* **39**, 653(1956). The rate of loss of weight of butylated urea resins on heating under different conditions up to 240 hours has been studied. The results suggest that at least two processes are operative, one of which is monomolecular and corresponds to the polymerisation of dimethylolurea dibutyl ether by loss of butanol only. The other process is thought to be the loss of volatile matter from the cured film. Examination of a fractionated resin likewise leads to the conclusion that the base resin obtained at the end of the distillation stage in manufacture contains no free butanol. The polymerisation rate of dimethylolurea dibutyl ether is accelerated in solution. Suggested mechanisms for the reaction processes are offered on the basis of this and previously published data.

Polyepoxide resins—2. Applications of the materials. J. H. W. Turner and B. R. Howe(British Resin Products, Ltd.). *Paint Manuf.* **26**, 321(1956).

Improvement of drying oils by conjugation of double bonds. Part I—Methods of conjugation. W. A. Bush(Pacific Vegetable Oil Co.). *Am. Paint J.* **40**(46), 80(1956); **40**(48), 98(1956). Conjugation can be effected by a number of different methods, some, at least, of which can be operated on an industrial scale. Conjugated products of one oil, even of the same or nearly the same percentage of conjugation differ from one another in their properties, probably by reason of stereoisomerism.

Tris (hydroxymethyl) aminomethane and reaction products with fatty acids and formaldehyde. S. H. Shapiro(Armour & Co., Chicago). *Am. Paint J.* **40**(46), 70(1956). A series of compounds with unique properties are obtained from the condensation of fatty acids with tris (hydroxymethyl) aminomethane and formaldehyde. These products range from plastic-like materials to drying oils, plasticizers and hard waxes all with excellent alkali resistance.

A reappraisal of pearlescence. W. E. Decker. *Org. Finishing* **17**(8), 12(1956).

Corrosion resistance of phosphated steel after heating. J. Doss (Rock Island Aresenal). *Org. Finishing* **17**(8), 6(1956). Heating is detrimental.

Coatings for use with cathodic protection. A. C. Elm(New Jersey Zinc Co.). *Paint Varnish Production* **46**(9), 27(1956). Organic protective coatings, when employed with cathodic protection, are subject to electrolytic influences which tend to promote certain types of film failure. Foremost among these is blistering. This blistering occurs primarily over cathodic areas and is believed to be the consequence of the endosmotic transfer of water to the cathode surface coupled with the formation of alkali which destroys the bond between the coating and the substrate. It is suggested that electrically conducting paints, especially so-called zinc-rich paints, might prove to be especially well suited for use with cathodic protection.

Standards for steel pickling and pre-paint treatments. I. Geld, M. Acampora, and W. L. Miller(New York Naval Shipyard). *Org. Finishing* **17**(8), 14(1956).

New developments in acrylic coatings. W. H. Graeff(Rohm & Haas Co.). *Off. Dig.* **28**(379), 633(1956).

Evaporation of hydrocarbon solvents from alkyd films. R. D. Harline and J. R. Scheibli(Shell Development Co.). *Off. Dig.* **28**(379), 685(1956).

Molecular weight distribution of thermally polymerized triglyceride oils. I. Application of Flory's polycondensation theory. C. A. J. Hoeve(University of Pretoria, S. Africa). *J. Polymer Science* **21**, 1(1956). It is shown that Flory's polycondensation theory can be applied to polymerized oils if in the original oils the different acids are esterified at random with the alcohol groups of glycerol. This is approximately the case. Departures from this random state are smoothed out by ester interchange when the oil is heated at 300° for long periods, as is the case in polymerized oils manufacture. The amount of monomeric triglycerides in polymerized oils is calculated and compared with the experimental result. The amounts of some other species are also calculated.

II. Effect of intramolecular reaction. *Ibid.* **21**, 11(1956). In Flory's theory it is assumed that no ring formation occurs. This theory can in simple cases be extended to include this effect. Theoretical amounts of ring formation in the case of polymerized oils are compared with experimental results.

Fatty acids for protective coatings. J. V. Lang(Hardesty Co. of Canada). *Paint Varnish Production* **46**(9), 31(1956). A review. No references.

Color reactions of rosin derivatives. N. R. Kamath and G. D. Shetye(University of Bombay). *Paintindia* **6**(3), 29(1956). A number of colour reactions of various rosin derivatives have been studied and it is concluded that fluorescence, Liebermann-Storch, Halphen-Hicks, Millon and Gibbs tests are likely to be most useful in distinguishing the various resins from one another.

Aluminum soap gels. F. J. Licata(Metasap Chemical Co., Harrison, New Jersey). *Am. Paint J.* **40**(39), 94(1956).

Monomeric and polymeric butyl titanate. G. Sachs and F. Werther. *Paint Oil Colour J.* **129**, 894(1956). Monomeric butyl titanate is an organic liquid in which four butoxy groups surround one central titanium atom. Two reactions can take place with butyl titanate: interchange of ester radicals and hydrolysis. Butyl titanate is hydrolysed by moisture, damp air or water-containing substances producing titanium hydrate and butanol. Films obtained with butyl titanate are completely inorganic, which explains their excellent heat resistance. They stand up readily to temperatures of 600–650° and are unaffected by moisture or rain.

Rust inhibitive pigments. L. R. Sherman(Imperial Paper and Color Corp., Glen Falls, N. Y.). *Off. Dig.* **28**(379), 645(1956).

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• Detergents

Lenore Petschaft Africk, Abstractor

Studies on the disinfectant properties of G-11. S. Einola. *Ann. Med. Exp. et Biol. Fenniae (Helsinki)* **33**, Suppl. 8(1955). The antibacterial action of G-11 in aqueous solutions of sodium lauryl sulfate and potassium laurate is more dependent on the molar ratio of G-11 to the association colloid than on the total concentration of G-11 in the solution. Tween 80 has a marked inhibitory effect on the antibacterial activity of G-11, its effect being greater than that of blood serum. When the susceptibilities of various strains were examined by the paper disc method, it was established that the Gram-positive cocci displayed a greater susceptibility to G-11 than Gram-negative rods. Soap containing 2 per cent G-11 has a marked degerming effect on the bacterial flora of the hands when it is used regularly and exclusively. Extensive literature survey and bibliography included.

Alkyl sulfates. I. Critical micelle concentrations of the sodium salts. H. C. Evans(Shell Research Ltd., Thornton-Li-Moors, Chester, Engl.). *J. Chem. Soc.* **1956**, 579–86. The variation in specific conductivity with change in concentration of aqueous solutions has been used in determining the critical micelle concentrations of a number of Na alkyl sulfates in which the total hydrocarbon chains contain 8–19 C atoms and the position of the sulfate group ranges from the terminal to the medial position. Data are also presented for Na 1-tetra-decylpentadecyl sulfate. The slopes of the plots are used in estimating the number of counterions in the micelles. (*C. A.* **50**, 9102)

Partition chromatography of synthetic detergents. F. Franks (Brit. Launderer's Research Assoc., Hendon, Engl.). *Nature* **176**, 693–4(1956). A paper partition chromatography separation method has been developed for the normal Na alkyl sulfates with hydrocarbon chains of 12–18 C atoms. The method is applicable to alkyl arenesulfonates, sec-alkyl sulfates, and quaternary ammonium and pyridinium salts. The methods of ascending and circular chromatography were employed. Whatman No. 1 filter paper impregnated with hexadecyl alcohols, acted as the stationary phase and the mobile phase consisted of an aqueous EtOH solution saturated with hexadecyl alcohol. Resolution into 4–6 components was obtained with compounds studied. (*C. A.* **50**, 13480)

Perfuming of toilet soaps. R. Huttleston(Givaudan-Delawanna, Inc., New York). *Soap and Chem. Specialties* **32**(9), 75, 77, 79(1956). Factors involved in obtaining a satisfactory soap perfume are discussed. These include the quality of the fats used, degree of alkalinity, type of package used, discoloration and original odor of the fat. Accelerated aging tests for evaluating new perfumes are described.

Equilibrium dialysis of soap and detergent solutions. H. B. Klevens(Mellon Institute, Pittsburgh, Pa.) and C. W. Carr (Univ. of Minn., Minneapolis, Minn.). *J. Phys. Chem.* **60**, 1245–9(1956). Equilibrium dialysis measurements have been made on a series of anionic and cationic soaps and detergents.

Contrary to previously published reports, equilibration across cellophane membranes was observed in all cases for salt-free and polar hydrocarbon-free detergent solutions. The addition of dissolved hydrocarbon changed little and long chain alcohols and amine additives increased markedly the time necessary for equilibration. A change in the ionic strength of the solvent by the addition of KCl resulted in even greater time necessary for transport across the cellophane membranes. These data indicate that earlier measurements and all interpretations as to critical micelle concentrations, micelle formation, etc., based on these measurements must be reconsidered in the light of the new findings.

Micelle formation in solutions of some isomeric detergents. D. B. Ludlum(Univ. of Wisconsin, Madison, Wis.). *J. Phys. Chem.* **60**, 1240–44(1956). Measurements of electrical conductivity and of optical turbidity are reported for solutions of three isomeric dodecylbenzene sulfonates in water solution. The conductance behavior of these solutions is similar to that which has been reported for other detergents, while the light scattering behavior is typical of solutions of highly charged particles. Critical concentrations and micelle sizes have been determined from these measurements, and the conclusion has been drawn that an increase in hydrophobic nature lowers the critical micelle concentration and increases the micelle size in agreement with the predictions of recent theories of micelle formation.

The antibacterial activity of deodorant soaps. G. Meyer(P. Beiersdorf & Co. A.G., Hamburg, Ger.). *Fette-Seifen-Anstrichmittel* **58**, 239–43(1956). In the evaluation of germicidal action of soaps containing hexachlorophene, a sensitive test organism must be used. Coliforms are much less sensitive than staphylococci. Washing tests with toilet soap and 2 brands of deodorant soap containing hexachlorophene show that plain toilet soap is ineffective in reducing bacterial counts, and that the deodorant soaps are highly effective. (*C. A.* **50**, 13479)

Washing effect of detergents without or with organic solvents as components. O. Oldenroth(Waschereiforsch. Krefeld, Ger.). *Fette-Seifen-Anstrichmittel* **58**, 225–9(1956). Laboratory commercial laundry wash tests showed no advantage of detergents containing organic solvents over the same detergents without organic solvent in the removal of fatty materials from cloth. (*C. A.* **50**, 13480)

Surface activity of monoesters - fatty acid esters of sucrose. L. Osipow, F. D. Snell, Dorothea Marra, and W. C. York (Foster D. Snell, New York). *Ind. Eng. Chem.* **48**, 1462–4 (1956). Evaluation studies indicate that the fatty acid esters of sucrose are emulsifying agents and good detergents. They are sufficiently stable to hydrolysis for use in cotton detergency applications. Low toxicity also points to use in cosmetic, pharmaceutical and food applications.

The inhibition of foaming. VII. Effects of antifoaming agents on surface-plastic solutions. S. Ross and J. N. Butler(Rensselaer Polytechnic Inst. Troy, N. Y.). *J. Phys. Chem.* **60**, 1255–8(1956). Solutions of soaps, commercial synthetic detergents and proteins produce foams of outstanding stability by virtue of plastic surface films. Solutions of USP grade sodium lauryl sulfate are shown to form surface-plastic films. Aging the sodium lauryl sulfate solution, or changing the pH with sulfuric acid or with sodium hydroxide, or the addition of small amounts of antifoaming agents to the solution—each of these actions tends to retard or destroy the formation of the surface-plastic film. The addition of commercial antifoams to protein solution is also shown to reduce or inhibit the normal surface plasticity of such solutions. The mechanism of anti-foaming action in surface-plastic solutions is, therefore, related to the destruction of the surface-plastic film by the antifoam.

Clinical evaluation of a new neutral detergent bar. F. Swanson, M.D.(New York). *J. Am. Med. Assoc.* **162**, 459–61(1956). A neutral detergent bar (Dove), which gives a lather with a pH of 7, was evaluated in a selected group of 200 dermatological patients. Of these, 135 had dermatoses often intolerant to commonly used toilet soaps. Eighty-three to 85% of the patients with presumably generally poor tolerance for toilet soaps showed no signs of ill-effects from the regular use of the neutral detergent bar. The results suggest a much better skin tolerance among these dermatological patients to the neutral detergent bar than to commonly used toilet soaps. It is inferred that this difference may be due to the neutral pH (7) of the neutral detergent bar lathers, as compared with the quite alkaline (pH 10) lathers of most commonly used toilet soaps.

Coconut oil substitutes. S. A. Tramazi and M. Anwar Ali Bhatti (Agricultural College and Research Institute, Lyallpur, West Pakiston). *Soap and Chem. Specialties* **32**(10) 43–5, 201 (1956). Studies on the manufacture of toilet soaps by cold process and trials of different mixtures of various vegetable oils such as Brown sarson, sesame, peanut and castor oils as substitutes for coconut oil have been reported. It has been shown that of the total quantity of oils required for manufacture of toilet soaps 50 percent must be coconut oil for good lathering and other detergent qualities, and the balance can be made up by sesame, peanut and castor oils. The quality of these soaps was up to standard. They were found to contain only very small quantities of free alkali and free fat, the total fatty acids have been found to be within limits of toleration.

Recent developments in brightening agents. H. W. Zussman, W. Lennon and W. Tobin(Geigy Chem. Corp., Ardsley, New York). *Soap and Chem. Specialties* **32**(8), 35–9, 81(1956). The use of brightening agents in soap is discussed and the development of new brighteners described.

Use of "saponides" (synthetic detergents) for the manufacture of surface-active tablets. J. P. Sisley. *Rev. franc. corps gras* **3**, 405–24(1956). The possibility of making synthetic detergent in bar form is discussed. Patents on the subject are listed according to their composition, and the preparation and properties of each are discussed. (*C. A.* **50**, 12510)

Facts about effects of EDTA on soap. P. I. Smith. *Am. Perfumer Essent. Oil Rev.* **68**, 57(1956). The most important characteristic of EDTA salts is their ability when in aqueous solutions to prevent the precipitation of calcium and magnesium soaps from hard water and also to redissolve such soaps once they are formed. This property can be used to clarify liquid soaps. EDTA can also be used to remove trace metals such as copper and iron which will discolor soaps and cause spoilage.

Detergents. R. A. Grifo(General Aniline & Film Corp.). *U. S. 2,766,212.* Detergent compositions with improved foaming, foam stable and detergent properties consist of a combination of polyoxyalkylene compounds and polyvalent metal salts, e.g. about 80% by weight of the ammonium salt of the sulfuric acid ester of the condensation product of one mole of oxotridecyl alcohol with two moles of ethylene oxide and about 20% by weight of magnesium chloride.

Sulfonate detergent blend. Esso Research and Engineering Co. *Brit. 749,737.* A superior detergent is prepared by blending a water soluble alkali metal salt of a branched chain alkyl aryl sulfonic acid with a minor proportion of a water soluble alkali metal salt of a straight-chain secondary alkyl aryl sulfonic acid to improve detersive properties.

Detergent composition. M. Katzman(Process Chemicals Co.). *U. S. 2,757,143.* Higher fatty acid amides of monoisopropanolamine are found to be synergistic agents in improving and enhancing detergency of the water-soluble salts of alkyl sulfonic acid, sulfuric acid esters of polyhydric alcohols incompletely esterified with fatty acids of high molecular weight.

Detergent composition and method of producing same. C. M. Knowles and J. J. Ayo, Jr.(General Aniline & Film Corp.). *U. S. 2,758,977.* A clear fluid detergent can be prepared from the ammonium salts of alkylphenol polyglycol ether sulfate by condensing approximately four mols of ethylene oxide with one mol of alkylphenol and using a minor amount of an ion sequestering agent consisting of an alkali metal salt of ethylene-diamine tetraacetic acid.

Shaped mixture of soap and phosphonate. J. Nusslein(Metallgesellschaft Aktiengesellschaft). *U. S. 2,765,279.* A neutral, hard water resisting soap bar consists of a mixture of about 80 percent oleic acid and fatty acids from coconut oil and lard, and about 20% of stearyl amino phenyl phosphonic acid, the mixture being neutralized with an alkali metal hydroxide.

Stabilized detergent composition. H. H. Reynolds and O. Yeaton(E. I. du Pont de Nemours & Co.). *U. S. 2,765,280.* Alcohol sulfate type detergents are stabilized against discoloration or cloudiness upon storage by the addition of citric acid as a color stabilizer combined with a small amount of zinc and iron ions.

Determination of the active agent in carboxymethylcellulose preparations. K. Wilson. *Svensk Paperstidn.*, **59**, 218–22(1956). The method described for determining the sodium carboxymethylcellulose content in low-viscosity CMC products consists in isolating the pure sodium salt by a combined treatment with acid and neutral ethyl alcohol. The method is compared with other methods described in literature.