ABSTRACTS . . . . E. S. Lutton, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Glycolides and glycerides of pyromucic acid. M. A. Abramova and M. E. Egorova (Saratov Med. Inst.). *Zhur. Priklad. Khim.* (J. Applied Chem.) 23, 976-9(1950). Heating glycerol with 6 moles pyromucic acid 2.5 hrs. at 230-40° gave the glycerol triester, m. 98-9° (from ethanol), needles, *n* 1.67. Different reagent proportions give the same product in lower yields; the best yield (82%) is obtained under the above conditions. (*Chem. Abs.* **46**, 10148)

Synthesis of glycolides and glycerides of cinnamic acid. M. A. Abramova and M. E. Egorova (Saratov Med. Inst.). *Zhur. Priklad. Khim.* 23, 980-4(1950); *J. Applied Chem. U.S.S.R.* 23, 1034-41(1950). Heating glycerol with 6 moles $PhCH:CHCO_2H$ 4 hrs. at 230-60° gave 80% glyceryl tricinnamate, m. 111° (from ethanol), thin needles. A 2:1 molar ratio in 4 hrs. at 210-30° gave 63% glyceryl monocinnamate, a very viscous yellow oil. (*Chem. Abs.* **46**, 10131)

Vegetable seeds with 10-65% oil content suitable for versatile solvent extractor. Anon. *Chem. Proc.* **15**(11), 6-7, 16-17(1952). The De Smet horizontal extractor is described.

Whale oil process afloat. Anon. *Can. Chem. Proc.* **36**(11), 38-9 (1952). A brief description of the oil recovery equipment aboard a new whaler.

Survey of water-insoluble acids in commercial butter. T. V. Armstrong, W. J. Harper and I. A. Gould (Ohio State Univ., Columbus). *Butter, Cheese, Milk Products J.* 42, No. 5, 28-30, 53-4(1951). The water-insoluble acid test (WIA) was reliable for butter. The values could be reproduced, and added acids were recovered with an accuracy of 5%. A survey of 32 samples of commercial butter yielded WIA values ranging from 128 to 612 mg. per 100 g. of fat. A general inverse relation was found between score and WIA values, but many inconsistencies were noted. (*Chem. Abs.* **46**, 10476)

Variation in lipide content of tubercle bacilli as a function of the age of the culture. J. Asselineau (Inst. phys. chem. biol., Paris). *Ann. inst. Pasteur* **81**, 306-10(1951). Lipide fractions of young and aged cultures of tubercle bacilli were compared. Free lipide was 7-10% of the dry weight in young bacilli and 20-22% in aged bacilli. The same concentration of phosphatides was present in both but the wax content increased markedly with age. (*Chem. Abs.* **46**, 9653)

The fungus Mucor mucedo as a fat producer. M. Blinc (Slovene Acad. Sci. Arts, Ljubljana, Yugoslavia). *Slovenska Akad. Znanosti Umetnosti, Razred Mat., Fiz. Tehn. Vede, Class III, Ser. A, Razprave* **III**, 41-56(1951). The ether extract of *M. mucedo*, a viscous, clear, orange-brown oil, had the following characteristics: acid value, 14.8; saponification no., 165.2; ester value, 150.4; iodine no., 92.4; refractive index at 40°, 1.4674; unsaponifiable matter, 4.23%. (*Chem. Abs.* **46**, 9663)

The determination of fat in foods, especially in herrings. C. H. Brandes and R. Dietrich (Inst. Meeresforsch., Bremerhaven, Ger.). *Deut. Lebensm. Rundschau* **48**, 165-9(1952). A large number of fat determinations was made on samples of herring caught in different parts of the North Sea fishing grounds. By proper grinding a homogeneous mixture is produced which gives excellent duplicates not only for the fat determinations but also for water, proteins, etc. (*Chem. Abs.* **46**, 10479)

The deacidification of coconut oil by short-path distillation. S. G. Brooker and L. Hartman (Dept. Sci. Ind. Research, Wellington, N. Z.). *New Zealand J. Sci. Technol.* **33B**, 488-92 (1952). A prepilot-scale falling-film distillation of coconut oil at 170-180° and 0.1 mm. pressure will lower free fatty acid content from 3-4 to 0.2%. The difference of volatility between the free acid (lauric) of coconut oil and its low-molecular glycerides is not sufficient to permit a good separation of these components in a molecular still while maintaining a satisfactory distillation rate. Unsaponifiables and color concentrated in the distillate. (*Chem. Abs.* **46**, 9870)

Volatile acids in the secretion products (hair grease) of the skin. E. Brouwer and H. J. Nijkamp (Agr. Univ. College, Wageningen, The Netherlands). *Biochem. J.* **52**, 54-58(1952). In the lipid fractions from the three species of ruminants all 7 volatile acids (C_2-C_6, C_8 and C_{10}) were present. In cattle C_8 and C_{10} acids were preponderant whilst in sheep C_4 and C_5 acids predominated. In male goats the 7 volatile acids were more evenly distributed, but C_8 and C_{10} acids predominated. The lipid fractions from 8 dogs contained virtually only C_5 acids.

Determination of the fat content of milk by determination of the total moisture. A. Camus, Jacqueline Burdin and Annie Le Guen. *Lait* **31**, 15-20(1951). The fat content is determined by use of a formula as follows: $G = 100 - 1.1\,H$, where G equals fat and H equals moisture content. (*Chem. Abs.* **46**, 9739)

Lipides of skin atheromas. S. Cmelik (Hyg. Inst., Zagreb, Croatia). *Biochem. Z.* 322, 497-501(1952). The small amount of lipide extracted from skin cysts with alcohol-ether mixture consists of 5.5% phospholipide and 94.5% neutral lipide. The latter consists of 54.7% unsaponifiable matter (of which 91.5% is cholesterol, 2% hydrocarbons, small amounts of higher alcohol, and no squalene). The fatty acids have an average molecular weight of 294 and consist of 37.1% saturated and 59.3% unsaturated. (*Chem. Abs.* **46**, 10391)

The rancidity-retarding properties of nordihydroguairetic acid. R. Dalmau. *Afinidad* 28, 205-9(1951). The samples were tested by the method of Owen, by using 50-g. portions at 63° in a glass vessel under dry air. An "index of protection" (IP) was the ratio of the no. of hrs. to first notice rancid odors in a control to that with a protected sample. For a carefully rendered lard (containing 4-10 γ natural tocopherols) the IP for N.D.G.A. acid test at 0.01% was 19, at 0.05% 25; for hydroquinone at 0.01% 8; hydroquinone at 0.05% 17; tocopherols at 0.01% 3; tocopherols at 0.05% 9. For steam-rendered lard, the IP with N.D.G.A. was 32 at 0.02% and 56 at 0.10%. The optimum amount of N.D.G.A. was 0.05%; further increases proved ineffective. (*Chem. Abs.* **46**, 10645)

The analysis of technical monoglycerides. A. Doadrio and R. Montequi. *Anales real soc. espan. fisica y quim.* **48B**, 69-74 (1952). Use of $NaIO_4$ instead of HIO_4, since it can be obtained more easily, in the method of Handschumacker and Linteris permitted more rapid and economical analysis. A semimicro method is proposed. The amounts of free di- and triglycerides are calculated from the neutralization index of the fatty acids, acidity and saponification indexes, and amount of monoglycerides and free and unsaponifiable glycerol. (*Chem. Abs.* **46**, 9869)

Determination of the carbonyl compounds of fat. N. S. Drozdov and N. P. Materanskaya. *Myasnaya Ind. S.S.S.R.* 23, No. 3, 73-5(1952). The NH_2OH reaction with a carbonyl group was applied to measurement of changes in fat during storage. When run on acids or acid samples the determination must be corrected for the amount of acidity in the original. (*Chem. Abs.* **46**, 9868)

PATENTS

Process for solvent extraction of castor oil from castor seed. I. M. Colbeth (Baker Castor Oil Co.). *U. S. 2,616,907.* The comminuted seed is extracted with a hydrocarbon solvent and the resulting miscella cooled until two layers are formed. The lower layer which has the higher oil content is separated and the oil recovered from it.

Continuous process for solvent extraction of castor oil from castor seed. I. M. Colbeth and J. S. F. Carter (Baker Castor Oil Co.). *U. S. 2,616,908.* A continuous process is disclosed in which the seed is comminuted in the presence of a hydrocarbon solvent, the marc is continuously vacuum filtered, the resulting miscella separated into two layers by cooling and the oil recovered from the lower layer.

Continuous filtration process for solvent extraction of castor oil from castor seeds. J. S. F. Carter (Baker Castor Oil Co.). *U. S. 2,616,909.* In a continuous process for the recovery of oil from castor seed, the step is claimed of continuously filtering the miscella on a horizontal rotary vacuum filter.

Rendering fats. C. Pavia (Pavia Process, Inc.). *U. S. 2,616,910.* A process is disclosed in which fat bearing tissues are dried below the congelation temperature of the fat. The dried comminuted tissue is then heated while being violently agitated at a temperature above the liquefaction point of the fat and below 212°F. until the fat becomes liquefied and the fat is then physically separated from the tissue.

Method of separating butterfat from globules thereof. S. Patton and C. M. Stine (The Pennsylvania Research Corp.). *U. S. 2,617,731.* Butter oil is separated by heating milk or cream to 120-210°F. in the presence of a compound which lowers the interfacial tension and separating the oil from the mixture.

The compound claimed contains 3-10 C atoms and hydrogen and oxygen or nitrogen.

Disproportionation of rosin acids and fatty acids. D. E. Floyd (General Mills, Inc.). *U. S. 2,617,792.* Process is claimed for the disproportionation of rosin acids in the presence of higher polyolefinic fatty acids, which comprises heating a mixture of rosin acids and polyolefinic higher fatty acids to a temperature in the range 200-300° in the presence of a nickel hydrogenation catalyst and in the presence of carbon dioxide under at least 25 pounds per square inch pressure.

Methods of extracting fatty matter from cork. A. Guillemonat (Society "Suber," S. A.). *U. S. 2,617,814.* The method of obtaining a fatty matter from cork is claimed which comprises heating a mixture of powdered cork and at least one alcohol containing less than 5 C atoms in the presence of an amount of an alkaline catalyst ranging from 5 to 6 per cent by weight of the amount of cork treated, distilling off the excess of alcohol from the mass thus heated, and subjecting the dry residue obtained after this distillation to extraction by organic solvent and recovering a solution containing esters of the fatty acids of the cork.

Extractor. E. W. Flosdorf and E. C. Distler (F. J. Stokes Machine Co.). *U. S. 2,619,024.* A continuous counter-current horizontal extractor is disclosed.

Method of separating the components of a mixture of fats and oils. C. Greenfield. *U. S. 2,619,421.* Solid fats are separated from liquid fats by slowly cooling the mixture over the course of about 18 hours.

Drying and defatting tissue. E. Levin. *U. S. 2,619,425.* In a process for drying and defatting a biological substance which comprises simultaneously defatting and drying by azeotropic distillation, using a water-immiscible fat solvent, and maintaining a temperature below 100°, the improvement is claimed which comprises converting the substance into fluid pumpable form, then introducing the fluid substance in the form of droplets into a boiling body of solvent, removing the water from the substance in the form of an azeotrope, and recovering the dry, defatted substance.

Monoglycerides. F. A. Norris (Swift & Co.). *U. S. 2,619,493.* The process of producing substantially pure monoglycerides is disclosed which comprises reacting glycerin with an oxo-carbonyl compound whereby two of the hydroxyl groups of the glycerin are blocked, esterifying the resulting product by reaction with an alkyl ester of a fatty acid, purifying the esterified reaction product by high vacuum distillation, and thereafter unblocking the blocked hydroxyl groups by removing the oxo-carbonyl compound to form a monoglyceride.

Hydrolysis of fats and oils. J. Ross and W. R. Trent (Colgate-Palmolive-Peet Co.). *U. S. 2,619,494.* A process of hydrolyzing fatty material to produce fatty acids and glycerine is claimed which comprises intimately contacting fatty material with water by countercurrent flow at high temperatures and at superatmospheric pressures in the presence of a stabilizing catalyst having antioxidant and catalytic properties to avoid substantial darkening of the fatty acids and glycerine produced, the stabilizing catalyst consisting of an hydroxy aromatic derivative compound having at least one alkyl group attached to a single benzene nucleus.

Preparation of wool grease unsaponifiable matter. R. M. Christenson and R. E. Harpt (Pittsburgh Plate Glass Co.). *U. S. 2,619,495.* Saponified wool fat is dissolved in an aqueous alcohol (C_1-C_4) to give a solution containing 5-30% unsaponifiable matter. The unsaponifiable matter is continuously and countercurrently extracted with naphtha.

Dehydration of castor oil. R. C. Carter, Mary Jarvis and Imperial Chem. Ind. Ltd. *Brit. 671,368.* Catalytically dehydrogenated castor oil of unusually light color is obtained by heating castor oil in the presence of 0.4-0.5% H_3PO_3 alone or in the presence of ordinary dehydrogenation catalysts such as H_2SO_4. (*Chem. Abs.* **46**, 9872)

Treatment of fatty acid esters. B. Blaser and W. Stein (Henkel & Cie. G.m.b.H.). *Brit. 674,884.* Esters of unsaturated fatty acids are isomerized by heating finely divided metallic Co catalyzers or metal carbonyls at elevated pressures with CO. The advantage is an increased melting point or better drying properties. (*Chem. Abs.* **46**, 10648)

Apparatus for the continuous extraction of oil. Y. Matsumoto. *Japan 1311('50).* (*Chem. Abs.* **46**, 9900)

Hydroxylation of fats and oils. Y. Ishii. *Japan 2840('50).* Unsaturated fats and oils are hydroxylated by H_2O_2 in acetic acid in the presence of an organic sulfonic acid, an alkali sulfonate, or sulfonyl chloride as a catalyst. (*Chem. Abs.* **46**, 10648)

Fatty acids and polymerized oil from high-acid rice oil. S. Shitamoto, I. Yamakita and S. Tomioka. *Japan 3730('50).* Rice oil (acid no. 60) is heat-polymerized at 150-300° alone or in the presence of Co, Mn, Pb, Mg, Al, or Fe, or their compounds to an iodine no. less than 60 and distilled *in vacuo* to obtain a residue containing polymerized oil of acid value < 20. (*Chem. Abs.* **46**, 9872)

Hydroxylated oil. I. Shinowara, K. Sarui and T. Tanigawa. *Japan 3732('50).* Unsaturated oils are hydroxylated with O, H_2O_2 in formic acid alone or with HNO_3 or H_3PO_4. (*Chem. Abs.* **46**, 9872)

Decolorization of rice oil. S. Nojima and S. Ishikawa. *Japan 3633('50).* Rice oil is decolorized with H_2O_2 in the presence of sulfonated oil or soap. (*Chem. Abs.* **46**, 9872)

Treatment for fish-oil foots. T. Tsuchiya and H. Akiyama (Bureau of Industrial Technics). *Japan 43('51).* The foots are adjusted to contain a small amount of free alkali, diluted with water, and hydrogenated with Raney Ni. (*Chem. Abs.* **46**, 10648)

• Biology and Nutrition

R. A. Reiners, Abstractor

The quantitative evaluation of resorption occurring upon splitting of neutral fat. K. Bernhard, H. Wagner and G. Ritzel (Univ. Basel, Switz.). *Helv. chim. Acta* **35**, 1404-11(1952). Rats were fed triolein which was D-labeled in the glycerol portion, or a fat D-labeled in the fatty acid and glycerol portion. The lymph was collected intermittently from the thoracic duct. On the basis of its D content, 24-53% of the fat was hydrolyzed during absorption. Only a slight D concentration was found in the lymph and lymphatic fats after administration of tagged glycerol or triacetin. When the latter was fed to bile fistula dogs, only traces of D were found in the lipides of the feces. Fed glycerol does not participate in the re-esterification of the intestinal fats. (*Chem. Abs.* **46**, 10347)

The utilization of vitamin A. II. Influence of antioxidants. G. C. Esh and S. Bhattacharya (Bengal Immunity Research Inst., Calcutta). *Indian J. Physiol. and Allied Sci.* **6**, 43-7 (1952). Addition of 2% α-tocopherol and 4% lecithin significantly enhanced liver storage of vitamin A fed to vitamin A-deficient rats. The action of the 2 antioxidants was synergistic and tended to vary with the nature of the diluent (arachis oil, ethyl oleate, or water) and the form of vitamin A (acetate or alcohol). (*Chem. Abs.* **46**, 10323)

Fat-soluble vitamins. A. R. Kemmerer (Univ. of Arizona, Tucson). *Ann. Rev. Biochem.* **21**, 333-54(1952). A review of a year's work on the chemistry and physiology of vitamins A, D, E, and K, essential fatty acids, vaccenic acid, and miscellaneous factors. (*Chem. Abs.* **46**, 10328)

Tolerance of glycerides from Fischer-Tropsch synthetic acids containing 6-12 carbon atoms. H. Kraut. *Angew. Chem.* **62**, 38(1950). The susceptibility to pancreatic lipase, rate of growth, and respiratory coefficient, etc., of dogs and pigs showed in parallel tests no difference between the synthetic and natural fats, provided the former were free from oxyacids, which imparted a harsh taste to the pig's flesh. The deposited fats were free from the C_{6-12} acids. (*Chem. Abs.* **46**, 10317)

Measurement of total body fat in living rats by absorption of cyclopropane. G. T. Lesser, A. G. Blumberg, J. M. Steele, H. Reiter and Y. Porosowska (Goldwater Memorial Hosp., Welfare Island, N. Y.). *Am. J. Physiol.* **169**, 545-53(1952). The fat content of rats was determined *in vivo* by determination of the cyclopropane taken up by the animals in an enclosed gas system. Values for total body fat by this method agreed closely with total ether extract. (*Chem. Abs.* **46**, 9651)

The digestibility of domestic seed-oil residues (rape, mustard, poppy, tobacco, and other extraction salvage). K. Nehring and W. Schramm (Landwirtschaftl versuchstation, Rostock, Ger.). *Arch. Tierernahr.* 2/3, 81-99(1951). Domestic seed-oil-extraction residues were analyzed for dry substances, organic substances, crude protein, crude fat, crude fibers, N-free extractable substances, and ash before and after feeding to sheep and swine. All salvage shows high crude-protein and digestible free crude protein values and most of the materials are high in Ca and P. (*Chem. Abs.* **46**, 9674)

The toxicity of antioxidants. I. Toxicity of 3,4-bis(m,p-dihydroxyphenyl)-n-hexane. R. Takata and S. Shimizu (Kyoto Univ.). *Vitamins* (Japan) **5**, 126-8(1952). The toxicity for rats of the following antioxidants was examined: 3,4-bis(*m,p*-

dihydroxyphenyl)-*n*-hexane, N.D.G.A., hydroquinone, pyrogallol, and pyrocatechol. Judging from the decrease of the body weight of rats, the toxicity of 3,4-bis(*m,p*-dihydroxyphenyl)-*n*-hexane was several times as large as that of N.D.G.A. (*Chem. Abs.* 46, 10413)

The toxicity of antioxidants. II. Toxicity of N. D. G. A. and ionol. R. Takata and T. Nagata (Japan Vitamin Oils Company). *Vitamins* (Japan) 5, 203-5(1952). By oral administration of N.D.G.A. or ionol (2,6-di-tert-butyl-p-cresol) of 1-10 mg. per day to rats the increase of body weight was not affected. (*Chem. Abs.* 46, 10413)

The toxicity of antioxidants. III. Toxicity of several newly synthesized antioxidants. T. Nagata and T. Kojima (Kyoto Univ.). *Vitamins* (Japan) 5, 206(1952). The toxicities of 2,6-bis(4-hydroxy-2-methyl-5-isopropylbenzoyl)-*p*-cresol, hydroquinone-N.D.G.A., and hydroquinone-hexestrol were determined for rats by the administration of margarine containing 0.01-0.05% of these antioxidants. It was confirmed that only 2,6-bis(4-hydroxy-2-methyl-5-isopropylbenzoyl)-*p*-cresol had no toxicity for rats. (*Chem. Abs.* 46, 10413)

The effect of varying amounts of dietary cholesterol and of choline upon liver lipids. Jessie H. Ridout, C. C. Lucas, Jean M. Patterson and C. H. Best (Univ. Toronto, Toronto, Canada). *Biochem. J.* 52, 79-83(1952). Increasing amounts of dietary cholesterol caused a progressive increase in the accumulation of both glycerides and cholesteryl esters in the livers of rats. On same diet plus 0.368% choline rats were able to maintain liver glycerides within or only slightly above the normal range even on a diet containing 1.6% cholesterol. Cholesteryl ester concentration in the liver was slightly elevated even at the larger intake of choline when the diet contained 0.2% cholesterol; further increases in dietary cholesterol caused progressive increases in the deposition of cholesteryl esters.

Fat metabolism under long physical loadings. N. N. Yakovlev (Leningrad Phys. Culture Inst.). *Fiziol. Zhur. S. S. S. R.* 38, 332-6(1952). Experiments with prolonged exercise (running, walking, swimming) raise the total blood lipide level and lower the blood phospholipides. These effects are accompanied by fatty infiltration of liver in rats; similar results are observed in human subjects. Diet with high lipotropic content removes the liver infiltration completely, while a fat-rich diet promotes it. (*Chem. Abs.* 46, 10326)

• Drying Oils

Stuart A. Harrison, Abstractor

Physical problems connected with the drying of paint. N. A. Brunt. *Verfkroniek.* 25, 139(1952). Mol. changes, macroscopic structure, and influence of softeners on paint films during drying are discussed. (*Chem. Abs.* 46, 10635)

The blowing of oils. Oxidation and polymerization. M. Carriere. *Ann. Faculté sci. Marseille* 19, 11(1947). A review of the thories of Fahrion, Elm, Staudinger, Slensky, and Kappelmeier on peroxide formation and polymerization in drying oils and polymerization on heating in the absence of air. The analytical methods used in this study are described. Oils containing hydroxyl groups show a positive slope in the molecular weight-concentration graph whereas linseed, peanut, etc., show a negative slope. For blown oils the slope for linseed and peanut oil gradually changes with time of blowing until the sign changes. This indicates production of hydroxyl groups. Linseed oil showed a decrease in diene number during blowing, showing no rearrangement of isolated to conjugated double bonds was occurring. In studies of peanut, soybean, linseed, tung, etc., oils, oxidation was nonselective, i.e., the double bonds in multiple unsaturated acids were attacked at random. This is shown by the fact that the iodine numbers and thiocyanogen numbers run parallel. Blowing at 150-200° is recommended. (*Chem. Abs.* 46, 9858).

Dehydrated castor oil. P. Colomb. *Ind. Vernice* 6, 69(1952). The manufacture, properties, and application properties of dehydrated castor oil are reviewed. The effect of the selection of driers on its drying rate and on its water resistance is discussed in detail. (*Chem. Abs.* 46, 9858).

Film-forming ability of alfalfa oils. N. F. Ermolenko and E. N. Hovikova. *Izvest. Akad. Nauk. Beloruss S.S.R.* 1948, No. 3, 81. The seed of narrow-leaf alfalfa contains 3.14% oil by extraction with aviation gasoline. The oil belongs to the weakly drying class and may be used for preparation of glyptals. (*Chem. Abs.* 46, 9858)

Exhaustive solvent extraction of linseed by alcohol. M. Th. Francois and K. Khangy. *Bull. mens. ITERG* 6, 331(1952). Linseed extracted with ethanol at atmospheric pressure gives an oil with a lower acidity (0.2%) than linseed extracted with hexane (0.7%) or trichloroethylene (0.9%). Extraction with alcohol under pressure lowers the quality of the oil. (*Chem. Abs.* 46, 9859)

Polymerization of drying oils in vacuo. A. Ya. Korolev and N. I. Leonova. *Doklady Akad Nauk. S.S.S.R.* 85, 99(1952). Purified linseed oil was polymerized 3 hours at 310 ± .5°C. under 1 to 760 mm. At pressures of 100 mm. or lower the amount of volatile matter increases and the acid number decreases with diminished pressure. The oil obtained at 1 mm. is more viscous and has a higher density, refractive index, and molecular weight and is lighter colored than the oils polymerized at other pressures. Oils polymerized at 100-760 mm. are alike. (*Chem. Abs.* 46, 9860)

Old and new violin varnishes. K. Letters. *Farbe u Lack.* 58, 293(1952). The properties of some of the old varnishes used on violins are described. A highly successful varnish has been developed which was based on the use of polyvinyl acetate as the binder. (*Chem. Abs.* 46, 9860)

Can stand oils be improved by extraction or vacuum distillation? J. van Loon. *Verfkroniek.* 25, 196(1952). It has been found that part of the monomeric components of the stand oils of linseed and China wood oils (free acids, glycerides of unchanged or cyclized monomeric fatty acids) can be removed by vacuum distillation. The residues show a very high viscosity and no essential improvement as a paint or varnish component. (*Chem. Abs.* 46, 10638)

The composition of linseed oil. J. D. Mikusch. *Farbe u Lack* 58, 303(1952). Linseed oils from different sources of widely different climatic conditions were analyzed. It was concluded that the linoleic acid content remains nearly unchanged (17-18%) while the linolenic-oleic ratio varies with source and is largely responsible for the variation in iodine number. (*Chem. Abs.* 46, 9859)

Correlation between properties of alkyds and composition of modifying fatty acids. D. T. Moore. *Ind. Eng. Chem.* 44, 2676 (1952). This is an extension of earlier work on the properties of alkyds. The drying rates, hardness, and yellowing of alkyds were determined. The alkyds were made with dienoic and trienoic acids and with phthalic anhydride. Glycerol, P.E. and mixtures of the two were used as the polyol. The following mathematical relationships were established. For hardness—$H(A-P) = B$ where $H =$ Sward Hardness, $P = \%$ polyenoic acids and A and B are constants. The formula for after yellowing is $Y = K(D + 5T + 3C) + K^1$ where $Y =$ yellowing; $D = \%$ dienoic acids; $T = \%$ trienoic acids; $C = \%$ conjugated acids; K and K^1 are constants.

Chemistry of drying oils. M. Neidle. *Baskerville Chem. J. City Coll. N. Y.* 3, No. 1, 27(1952). A brief review of current theories dealing with thermal polymerization and autoxidation of drying oils. Farmer's hydroperoxide mechanism is discussed as well as Diels-Alder-type polymerizations. (*Chem. Abs.* 46, 9857)

The viscosity of stand oil mixtures. M. Palumbo. *Ind. Vernice.* 6, 37(1952). The viscosity η_r of mixtures of linseed oil stand oils does not follow the law of Einstein which states that it depends upon the volume fraction of the more viscous ingredient. This is said to be due to solvation of the less viscous phase and of the non-spherical nature of the macromols. (*Chem. Abs.* 46, 9859)

Oiticica oil. W. V. Prooijen. *Verfkroniek.* 25, 162(1952). A review of the properties of oiticica oil and its importance for the paint and varnish industry. (*Chem. Abs.* 46, 10638)

Engineering papers of the "Department of Paints and Lacquers" of the Textilingenieurschule (Farbereischule). K. E. Stock. *Deut. Farben-Z.* 6, 231(1952). A series of nine unpublished papers available only from the library of the Textilingenieurschule is reviewed. It includes papers on drying oils, soybean modified alkyds, styrenated oils, the oxygen absorption of oils and varnishes on storage, and others. (*Chem. Abs.* 46, 9861)

Improved coatings from ricinenic oil. R. Wilson. *Farbe u Lack.* 56, 107(1950). To prevent films of ricinenic oil from becoming sticky the oil is treated with pentaerythritol to change the ester radicals. The addition of 2-3% of maleic anhydride increases the stability toward water. The oil is especially suitable for the preparation of alkyd resins. In copolymerization with styrene at least 30 per cent of the latter must be used if the dried product is not to be sticky. (*Chem. Abs.* 46, 10638)

PATENT

Styrenated alkyd resins. J. S. Wakely. *Brit. 672,224.* Dehydrated castor oil (1470 pts.), glycerine (768 pts.) and sodium hydroxide (3 pts.) are heated to 150° for one hour. To this are added phthalic anhydride (1392 pts.) and styrene (660 pts.). The mixture is heated to 170° for two hours and 190° for 1.5 hours. A film cast from a solution of the resin containing drier, air-dried in two hours. (*Chem. Abs.* **46**, 9868)

• Waxes

E. F. Guttenberg, Abstractor

Trigona wax. H. Bennett, R. W. Pearman, W. D. Raymond. *Colonial Plant and Animal Products (Brit.)* **2**, 196-220(1951). Trigona, wasp or stingless bee wax, is produced by a wild bee, *Melipora* or *Trigona* species. The insects are widely spread, being plentiful in South America, the Far East and particularly Tanganyika. Noted for its stickiness, the wax has been used to adulterate beeswax. The purified wax, secured by boiling with H_2O and filtering through filter paper, had the following properties: m.p. 64.6°, sp.gr. $^{15\cdot5}$ 0.962, n^{80} 1.4625, acid value 7.9, saponification value 44.4, ester value 36.5, iodine value 98.3 (Wijs, 3 hours). (*Chem. Abs.* **46**, 9327)

Composition of tamarind seed kernel powder. P. B. Sarkar and A. K. Mazumdar (Indian Central Jute Committee, Calcutta). *J. Textile Inst.* **43**, T453-4(1952). Tamarind seed kernel (T.K.) powder has in the last few yrs. replaced starch in the size for jute yarns. Chemical analysis shows that it is a glucoside and not, as thought, a rich source of commercial pectin; the composition is probably glucosan 47.2, xylan 20.5, protein 17.5, fat and wax 8.2, and mineral matter 2.5%. (*Chem. Abs.* **46**, 9853)

The constitution of wool-wax esters. J. Tiedt and E. V. Truter (Univ. Leeds, England). *Chemistry and Industry* **1952**, 403. The occurrence in wool-wax esters of Me Et diesters of hydroxy acids was demonstrated by an 85-stage fractional crystallization from the ketone of a material obtained by Me_2CO extraction of the sludge precipitated by MeOH from an ether solution of wool grease and containing no straight-chain esters or lanoterpenol alcohols. The acidic portion of a fraction yielding only straight-chain saponification products (as indicated by formation of urea complexes) was separated into 26-methyloctacosanoic acid (I) (m. 76.1°, $[a]^{18}$ [$CHCl_3$] + 1.8, amide melting at 102.8°) and a hydroxy acid $HOC_{31}H_{62}CO_2H$, melting at 95.4-6.6°. The cholesteryl esters of I and of 24-methylhexacosanoic ($[a]^{18}$ [$CHCl_3$] + 1.5) and 28-methyltriacontanoic ($[a]^{18}$ + 3.0) acids were identified in other fractions. (*Chem. Abs.* **46**, 9325)

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Cold-process-transfer coating compositions. George Walton. *U. S. 2,598,332.* A thixotropic gel is used as a transfer coating material. The composition comprises a nondrying liquid oil (cylinder stock or lubrication oils in the range between fuel oil and petroleum grease, or non-drying vegetable oils with SAE viscosity ranging from 10 to 250), a solid wax (spermacetti, paraffin, yellow or white beeswax, carnauba, montan, or synthetic waxes which approximate the natural waxes in composition), and a coloring material, preferably a pigment which is not dissolved in the oil-wax composition. If the dye is soluble, a finely divided inert, insoluble material, such as diatomaceous earth, bentonite, or talc, is included, to help prevent "bleeding" of the soluble dye into the paper. The concentration of the oil and wax components in the composition is such that the oil and wax form a 2 phase dispersion. The proportions of the oil, wax, and coloring matter are chosen to provide a normally soft, spreadable thixotropic gel or solid solution that is normally resistant to free flow, but is free flowing when subjected to mechanical manipulation, such as pressure, stirring, and squeezing, in the usual operations of paper coating. Following the coating operation, the coating sets to a relatively soft, solid condition and does not offset or smear. (*Chem. Abs.* **46**, 9310)

Composition for rendering printing rollers nonmeltable. Lloyd W. Conklin. *U. S. 2,598,761.* A composition for coating glue-glycerol printing rollers consists of one part hexamethylenetetramine, six parts lanolin, and two parts glycerol. Any grease melting below 90°F. may be used in place of lanolin, or any alcohol boiling above 250°F. may be used instead of glycerol. The coated roller is stored for 30 days at 90°F. and a relative humidity of 55% to allow the coating to penetrate the glue-glycerol material and form a nonmeltable shell. (*Chem. Abs.* **46**, 9322)

Lanolin products (which form oil-in-water emulsions). W. C. Griffin (to Atlas Powder Co.). *British 666,972.* Lanolin alcoholysis products containing large amounts of wool wax alcohols, which are useful in cosmetic preparations and which emulsify in H_2O to form oil-in H_2O emulsions, are prepared by heating together (240-310°) in presence of an alcoholysis catalyst (oxides and hydroxides of Li, K, Na, Ca, Zn, 0.1%), lanolin and one or more polyoxyethers (I) of polyhydric alcohols containing < 6 C and $\nless 2/3$ as many OH per molecules as C. I should contain 0.5-20 oxyethylene groups per equivalent weight of OH in the polyhydric alcohol [e.g., ethers of $(CH_2 \cdot OH)_2$, $(CH_2)_3(OH)_2$, glycerol, sorbitol], and weight proportion of I to lanolin is 0.5-1 to 6-1 and molecular proportion of total I to lanolin $\ngtr$ 2.5-1. e.g., lanolin of combining weight 694 (1190) and mixed I (310 g.) prepared by treating aqueous sorbitol containing H_2O 15% (182) with $(CH_2)_2$ (264 weight pt.), are charged into a reaction flask and agitated with 500-g.-per-l. NaOH (3 cc.). The charge is heated in CO_2 to 250° for 110 min. and maintained thereat for 150 minutes, when activated C (30 g.) is added. Heating is discontinued but stirring continued until temp. drops to 180°, when the charge is filtered. The product is H_2O-dispersible to yield a stable oil-in-H_2O emulsion. [*Brit. Abs.* **BII**, 759, July (1952)]

Carnauba waxlike product from rice wax. Yasota Kawa-Kami, *et al.* (to Kao Soap Co., Inc.). Japan. 1820('50). Crude rice wax is hydrogenated completely, hydrolyzed to fat acids and wax, and the fat acids are distilled in vacuo to obtain a hard wax in the residue. In Japan. 1821('50), the crude wax is hydrolyzed to fat acids and wax, the fat acids are distilled in vacuo, and the residual wax is hydrogenated to a hard wax. (*Chem. Abs.* **46**, 8882)

Liquid penicillin in wax and oil. Norisuke Suzuki. Japan. 3762('50). Peanut or sesame oil is mixed with beeswax, heated to melt, cooled to 37°, exposed to ultrasonic waxes (14-570 kilocycles) to obtain a liquefied product, and then penicillin salt is added. (*Chem. Abs.* **46**, 9809)

• Detergents

Lenore Petchaft, Abstractor

A photomicrographic technique for studying hair soils and detergency. J. C. Ervin (Procter & Gamble, Cincinnati, Ohio). *J. Soc. Cosmetic Chemists.* **3**, 81-4(1952). A new piece of equipment is described which permits the study of detergency in its simplest terms—the detergent action on single fibers. The action is recorded on motion picture film for future study.

Foaming of non-ionic surface active agents. Manuel N. Fineman, George L. Brown and Robert J. Myers (Rohm & Haas, Philadelphia, Pa.). *J. Phys. Chem.* **56**, 963-6(1952). The foaming properties of non-ionic surface active agents vary markedly with the temperature of the test and with solubility of the surfactants as characterized by their cloud points. The principal effect of temperature is that of altering the solubilities. The compounds studied in greatest detail were those obtained from reaction of p-t-octylphenol with ethylene oxide. As opposed to colloidal electrolytes, for which the solubility in water increases with increasing temperature, these ethylene oxide polymers are insolubilized as the temperature is raised, presumably as the result of loss of water associated with the hydrophilic ether linkages in the chain. In correlating foam with cloud point, it was found that at temperatures below the cloud point, foam of non-ionics may be appreciable, while at temperatures above the cloud point, it is reduced markedly.

A new British base for germicidal soaps. John Gemmell (Robert Haldane & Co., Ltd., Paisley, Scotland). *Soap, Perfumery, Cosmetics* **25**, 1160-3(1952). The application of D.C.M.X. (2,4-dichloro-sym-m-xylenol) as a soap germicide is reviewed. It is non-caustic, has a very low toxicity, has a relatively slight and not unpleasant odor and is effective at low concentration. D.C.M.X. is soluble in common organic solvents and most perfumery oils and is very stable to alkali. It has a strong affinity for the skin and persists on the skin for some period of time. It has excellent bactericidal properties which do not appear to be influenced by the nature of the fatty acids present in soap, and is easily incorporated into tablet and liquid soaps.

Critical concentrations of potassium n-alkanecarboxylates as determined by the change in color and spectrum of pinacyanole. Simon H. Herzfeld (University of Chicago, Chicago, Ill.). *J. Phys. Chem.* **56**, 953-9(1952). In this study the dye method was applied to the measurement of the critical molarities of all straight chain saturated soaps sufficiently soluble in water at room temperature to permit the preparation of micellar solutions.

Germicidal soaps and cosmetics. C. A. Lawrence (University of Michigan, Ann Arbor, Mich.). *J. Soc. Cosmetic Chemists* 3, 123-33(1952). The literature on germicidal agents used in soaps and cosmetics is reviewed. Agents discussed include hexachlorophene, quaternary ammonium compounds and chlorophyll. The work on hexachlorophene soaps shows a marked reduction of the transient bacterial flora of the skin upon continued or daily use, but does not provide a sterile surface. 29 references.

Metal cleaners. Milton A. Lesser. *Soap, Sanit. Chemicals,* 28, No. 10, 42-5, 169, 171, No. 11, 46-9, 98(1952). Various types of metal cleaners, alkaline, solvent, emulsion and acidic cleaners, and methods of evaluating the efficacy of these materials are reviewed. Formulations for the different classes are included. 97 references.

New phosphate for soap. F. H. Mackenzie (American Dyewood Corp., Chester, Pa.). *Soap Sanit. Chemicals.* 28, No. 11, 43-4 (1952). The rinsing properties of soap can be improved by addition of a new glassy phosphate having a very high sequestering power, unusual dispersing properties at a pH of 10 and above, together with the unusual wetting power it gives to soap.

Antiseptic skin cleaners. M. Martin Maglio and John M. Hanegan (Vestal Laboratories, Inc., St. Louis, Mo.). *Soap Sanit. Chemicals* 28, No. 11, 38-41, 135(1952). An antiseptic powdered industrial skin cleanser was prepared as follows: 41.5% organic scrubber, 8.75% water softeners and detergent salts, 31.0% soap, 1.75% emollients, 0.65% G-11, 13.4% diatomaceous earth, and 3.0% moisture. A control powder was prepared omitting the germicide. Tests were made comparing skin cleansing and germicidal efficiency of the powdered germicidal soap, control powder and control bar soap. The control powdered skin cleanser had superior degerming effect as compared with the bar soap due to its sueprior detergent action and efficient mechanical scouring action of the organic scrubbers. But the antiseptic powdered skin cleanser was 60% more efficient than the control powdered soap. These results indicate that this type of soap when used in industry would result in marked reduction in the number of cases of skin infection, boils, carbuncles, etc., and reduce the possibility of transmission of diseases communicable by skin contact. 15 references.

The micelle and swollen micelle. Soap micelles. W. Philippoff (Univ. of Minnesota, Minneapolis). *Discussions Faraday Soc.* No. 11, 96-107(1952). The system soap-H_2O-electrolyte exists above the critical concentration for micelle formation in 3 distinct regions: (1) low n (number of charges per micelle) region with no electrolyte present, (2) medium electrolyte concentrations with n relatively low, (3) n high and extraordinarily temperature dependent. Published data are interpreted with regard to this 3 region concept and the equilibria, monodispersity, micellar size, shape, and order, hydration, solubilization, and interaction in micellar soap systems. The number of micelle-forming ions (x) and n are both functions of the osmotic activity and specific conductivity of soap solutions. For systems that have been studied by both methods x and n can be calculated. Values for x and n are given for K laurate, K oleate, Na dodecyl sulfate, Na diisohexyl sulfosuccinate, Na diisooctyl sulfosuccinate, Na desoxycholate, dodecylamine-HCl, hexadecylpyridinium chloride, and tetradecyltrimethylammonium chloride. The data support the concept of a micelle consisting of a double layer of 50-100 mols., oriented to give an x-ray pattern partially ionized, and hydrated. 63 references. (*Chem. Abs.* 46, 8468)

Thermal investigation of phase transitions of sodium and potassium salts of higher fatty acids. G. B. Ravich and N. A. Nechitailo. *Doklady Akad. Nauk S.S.S.R.* 83, 117-20(1952). Differential thermograms were determined for pure Na and K laurate, myristate, palmitate, and stearate. Drying conditions of the freshly crystallized soap have an effect on the thermogram; thus, with K palmitate, there is a difference of the portions of the thermogram between 40 and 70° depending on whether the soap has been dried at 105° or over $CaCl_2$. The portion of the thermogram between 70° and 270° is independent of the method of drying, provided the rate of heating is the same. In the series of Na soaps, the molecular weight has very little effect on the phase transitions. All the Na soaps exhibit 7 homologous groups of phases. In the series of K soaps, there is a shift of the phase transition temperatures with increasing molecular weight and a change of the character of the thermogram. Na and K soaps of the same fatty acid differ in both the number of phases and the transition temperatures. Anhydrous K soaps melt higher than the corresponding Na soaps. (*Chem. Abs.* 46, 8491)

Washing powder of soap/phosphate mixtures: laboratory tests. H. Stupel. *Textil-Praxis.* 7, 231-4(1952). Data are given referring to the results of laboratory tests on the wash-power of mixtures of 1 and 2 g. standard soap (89% fatty acids) with from 0.5 g. to 6.0 g. of the following complex phosphates: sodium hexametaphosphate, sodium tripolyphosphate, tetrasodium pyrophosphate, sodium tetrapolyphosphate, and potassium metaphosphate. The best wash-power was possessed by the tetrapyrophosphate followed, in order, by tetrapolyphosphate, tripolyphosphate and hexametaphosphate. Hexametaphosphate showed the best calcium soap dispersing power. The best all round characteristics were found in potassium metaphosphate which, on economic grounds, is best used in conjunction with soap and pyrophosphate. Earlier conclusions on the falling-off of wash-power over a certain phosphate concentration, were confirmed.

Ethylene oxide derivatives and their uses in the textile industry. Giuseppe Trinchieri. (Translated by Dino Collodel). *Am. Dyestuff Reptr.* 41, 729-32, 751-2(1952). Two types of ethylene oxide derivatives, those having no surface-active properties and those having surface-active properties, are discussed. Glycols and polyglycols, ethanolamines and alkyl ethanolamines, and low molecular weight alcohol ethers are not surface-active. The glycols are used in textiles as lubricants, antistatic and finishing agents and dye dispersants, while ethanolamines are mild alkalis useful in manufacture of soaps, emulsifiers, and textile softeners. The derivatives having surface-active properties result from reaction of ethylene oxide with acids, esters, alkylamines, alkylolamides and glycerides. Structural formulas and properties are listed. The uses of these compounds as oil soluble emulsifying agents, wetting agents, detergents, softeners, and dyeing assistants in textile operations are listed.

An improved apparatus for the study of foams. Cheves Walling, Degar E. Ruff and James L. Thornton, Jr. (Lever Bros., Cambridge, Mass.). *J. Phys. Chem.* 56, 989-93(1952). This paper describes a modified apparatus for the study of both foam drainage and foam composition. It distinguishes between drainage of liquid from the interstices of intact foams and drainage due to bubble collapse. It permits the collection over a range of drainage times of large enough samples of foams for analysis. Finally, since the surface area of the foam being collected can be measured with reasonable accuracy, actual surface concentrations of surfactant materials in the foam can be calculated.

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Washing composition. Vladimir Dvorkovitz and Thomas G. Hawley, Jr. (The Diversey Corp.). *U. S. 2,615,846.* The deposition of films on articles being washed is prevented by adding to the hard water about 0.25-20% by weight of caustic alkali and about 0.025-2% by weight of alkali metal gluconate, the additions being free from ions capable of precipitating substantial amounts of calcium and magnesium salts.

Alkylaryl sulfonate detergents. Kenneth M. Thompson (Atlantic Refining Co.). *U. S. 2,615,847.* Alkylated aryl sulfonate detergents with low cloud point and improved color are prepared by adding to the alkylated aromatic hydrocarbon or hydrocarbon mixture in which the alkyl group contains from 9 to 15 carbon atoms, a minor amount of xylene, subjecting the mixture to sulfonation, recovering the resulting mixed sulfonic acids, or their corresponding alkali metal, ammonium, or amine salts.

Detergent composition. Charles E. Wheelock (Procter & Gamble Co.). *U. S. 2,616,855.* A solid form detergent composition with enhanced whiteness in sunlight is prepared from water-soluble alkali metal salts of higher fatty acid or non-soap anionic synthetic organic detergents by the addition of a carbostyril derivative (coumarins in which an NR group has replaced the heterocyclic oxygen atom) as a whitening agent.

Electrical lubrication of detergent shaping devices. Procter & Gamble Co. *Brit. 676,377.* The interface between plastic detergent compositions and other materials is lubricated and the physical properties of the detergent bars are improved by the passage of an electric current across the interface between the plastic detergent and the shaping device so as to attain a better shape of the bar and a smoother surface. Such electrical lubrication is said to increase the firmness and skin smoothness and toughness of the extruded bar.

Soaps and other washing agents. A. Lunn & Co. *Brit. 680,913.* A soap which reduces the alkalizing action of such washing agents on the skin is prepared by incorporating with the detergent an aliphatic aldehyde such as acetaldehyde.