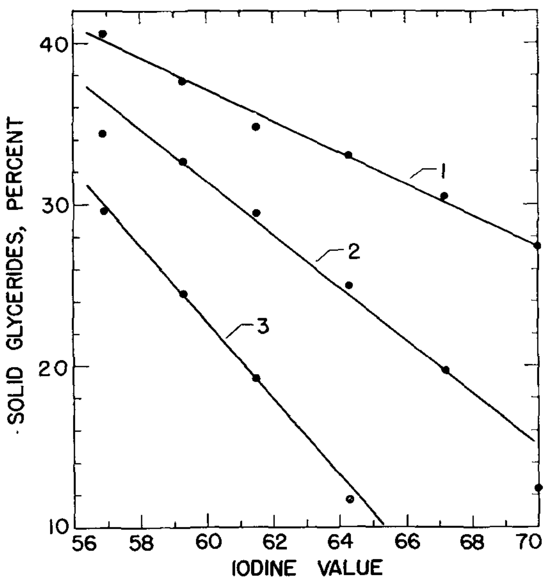

FIG. 3. Effect of hydrogenation on the content of solid glycerides of peanut oil at different temperatures: (1) 20°C.; (2) 25°C.; (3) 30°C.

Summary

1. The heat contents of hydrogenated and unhydrogenated peanut oils have been measured over a temperature range within which the glycerides of the oils changed from a completely solid state to a completely liquid one.

2. The specific heats of the oils in both solid and liquid states have been determined, and the heats of fusion have been calculated to be 21.7 cals./g. and 24.7 cals./g. for unhydrogenated and hydrogenated peanut oils, respectively. Equations were developed for expressing the specific heats of these oils (*Cp*, cals./g.), in terms of temperature (degrees C.):

Unhydrogenated, solid state (—163.16° to —33.16° C.): $Cp = 0.5042 + 0.00195t$

Unhydrogenated, liquid state (26.84° to 56.84°C.): $Cp = 0.4914 + 0.0004t$

Hydrogenated, solid state (—189.16° to —43.16° C.): $Cp = 0.4418 + 0.00159t$

Hydrogenated, liquid state (46.84° to 76.84°C.): $Cp = 0.4715 + 0.00117t$

3. The relative amounts of solid and liquid glycerides in hydrogenated and unhydrogenated peanut oils at different temperatures over the melting ranges of the respective oils have been estimated from calorimetric data.

4. The relationship between the content of solid glycerides in hydrogenated peanut oil and consistency, as determined by micropenetrations, has been established.

5. From previous determination of the micropenetration of hydrogenated peanut oils and present data, the correlation between the content of solid glycerides and the iodine values of progressively hydrogenated peanut oils has been established. Within the plastic range it is estimated that the reduction of iodine value by 1 unit increases the content of solid glycerides of progressively hydrogenated peanut oil by approximately 2%.

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ABSTRACTS . . . . **Don Whyte, Editor**

• Oils and Fats

R. A. Reiners, Abstractor

COMPOSITION OF THE SEED OIL OF *Xanthium riparium*. J. Tischer and A. Patzenhauer. *Fette u. Seifen* **52**, 137-40(1950). The dried seeds of *Xanthium riparium* contain about 36% oil and 41% protein. The oil has an acid no. 2.6, saponification no. 190.1, hydroxyl no. 8.6, iodine no. 143, and unsaponifiable 0.61%. The fatty acids have an acid no. 195.7, saponification no. 197.6, hydroxyl no. 13.1, iodine no. 151.2, average molecular weight 283.9, hexabromide no. 0.04, saturated fatty acids 7.3%. From these data the oil is calculated to contain oleic acid 24.5, linoleic acid 63.6, higher saturated acids 6.9, glycerol residue 4.3, and unsaponifiable 0.6%. The possibilities of industrial use are discussed. (*Chem. Abs.* **44**, 7569)

SOUTH AFRICAN FISH PRODUCTS. XXX. SEASONAL CHANGES IN THE COMPOSITION OF THE PILCHARD *(Sardinia Ocillata Jenyns)*. M. M. Black and H. M. Schwartz (Dept. of Chemistry, U. of Capetown). *J. Sci. Food and Agr.* **1**, 182(1950). Results of a 4-year study of seasonal changes in the yield and composition of the oil of pilchards from the west coast of South Africa indicate that in March or April the fish contain 10-15% oil, in May or June the oil content rises to 16-17% (the maximum), and by September or October it falls to a minimum (2-4%). The iodine value ranges from 172 to 203 and does not show any regular variation with the fat content of the fish. Water, protein, and P contents of the fish are also reported.

COMPOSITION OF KAPOK-SEED OIL. H. Nobori (Kao Soap Co. Ltd., Tokyo). *J. Soc. Chem. Ind., Japan* **44**, Suppl. binding 227-9(1941). The oil is an orange-yellow liquid; acid value, 11.8; saponification value, 194.1; iodine value (Wijs), 95.4; n^{20}_{D}, 1.4718. The composition was as follows: palmitic acid 10.1; stearic acid 4.6; oleic acid 52.9; and linoleic acid 25.9%. C_{20} acids were not isolated but are probably present. There is no linolenic acid or higher homologs. There is a small amount of phytosterol. (*Chem. Abs.* **44**, 8138)

THE CONSTITUENTS OF CHANA *(Cicer arietinum, Linn.)*. III. CHEMICAL EXAMINATION OF THE FIXED OILS FROM CHANA AND KABULI CHANA (ORDINARY AND WHITE VARIETIES). P. R. Bhandari, J. L. Bose, and S. Siddiqui (Council of Sci. & Ind. Res. Delhi). *J. Sci. Ind. Research (India)* **9B**, (3), 60-3(1950). Chana (chick-pea) and K. Chana (white chick-pea) were found to contain 4.1 and 5.0% oil respectively. The properties of these oils were about the same: n^{38}_{D} 1.4845; saponification value, 184.6; acid value, 2.4; iodine value (Wijs), 111.7; unsaponifiable matter, 4.0%. The composition of the fatty acids derived from these oils is: oleic acid, 52.1; linoleic acid, 38.0; myristic acid, 2.52; palmitic acid, 4.69; stearic acid, 1.87; arachidic acid, 0.06%. (*Chem. Abs.* **44**, 7570)

INVESTIGATION OF RICE OIL AND ITS UTILIZATION. IX. REFINING OF RICE OIL OF EXTRAORDINARILY HIGH ACID VALUE. S. Ueno (Imperial Univ. Osaka). *J. Soc. Chem. Ind., Japan* **44**, Suppl.

binding 291(1941). Rice-bran oil of very high acid no. is refined by washing with dilute alkali solution (0.5-3%) or a Na_2CO_3 and $NaHCO_3$ solution (1%). (*Chem. Abs.* **44**, 7569)

Conservation of refined colza oils. Jaillet-Rouyer (Bibliographic Service ITERG, Paris). *Bull. mens. ITERG.* **4**, 269-82(1950). A review describing causes of rancidity, reversion of flavor, influence of preliminary treatments (deodorization, etc.) on stability. 66 references. (*Chem. Abs.* **44**, 8138)

Study of ternary mixtures of fatty acids. I. The criteria of purity of fatty acids. Binary and ternary mixtures. C. Paquot (Lab. C.N.R.S., Bellevue, France). *Bull. soc. chim. France* **1950**, 400-1. Ternary diagrams are employed in analyzing the mixtures of commercial fatty acids.

II. Palmitic acid in mixtures with myristic and stearic acids. C. Paquot and L. Durrenberger. *Ibid.* 402-4. A method is described for preparing fatty acids of very high purity. Ternary diagrams are given which can be used to determine the exact composition of palmitic acid contaminated by myristic and stearic acids. (*Chem. Abs.* **44**, 7568)

Investigations on synthetic glycerides. K. E. Schulte. *Pharm. Zentralhalle* **86**, 97-111(1947): *Chem. Zentr.* **1948**, I, 118-19. A synthetic fat, produced by the Deutschen Fettsaurewerke, Witten-Ruhr, was light yellow in color; had d_4^{40} 0.9223; m.p. 34.1°; n_D^{40} 1.4585; viscosity at 40°, 87.31 centipoises; acid no. 0.17; saponification no. 229.8; unsaponifiable matter 0.46%; iodine no. (Hanus) 11.68; thiocyanogen no. 7.8; diene no. 0.3; hydroxyl no. 2.5. The fat acids were light yellow in color, and had d_4^{40} 0.8834; m.p. 36.2°; n_D^{40} 1.4443; viscosity at 40°, 11.38 centipoises; saponification no. 242.5; iodine no. (Hanus) 10.88; thiocyanogen no. 8.1; hydroxyl no. 0. Comparison of the hydroxyl no. of fat acids with that of the fat indicated the presence of mono- and diglycerides. Hydroxy and keto acids were not present in large amounts. Separation of the fat acids by the methods of Twitchell or Bertram presented difficulties. They were qualitatively separated by distillation. There was about the same proportion of acids with an even no. of C atoms as with an odd no. from C_8 to C_{18}; 50% had more than 18 C atoms. The greater part of the fat acids were saturated. There was a change after long exposure to air and O_2, due to peroxide formation. The increase in "peroxide character" took place relatively slowly. Exposure to ultraviolet radiation imparted an intense soapy taste to the fat. (*Chem. Abs.* **44**, 7566)

Syntheses of several branched-chain fat acids and their antibacterial actions. M. Asano, K. Takahashi, T. Murakami, Y. Tsutsumi, Y. Miura, and Y. Toyoizumi (Univ. Tokyo). *J. Pharm. Soc. Japan* **70**, 202-9(1950). Tests *in vitro* against avian type tubercule bacilli showed maximum antibacterial action in myristic acid derivatives with side chains at the α-, β-, γ-, and ε-positions. Methods of synthesis of these acids and related acids are given. (*Chem. Abs.* **44**, 7229)

The configuration of the naturally occurring mixed glycerides. Part vi. The component fatty acids and glycerides of stillingia tallows. S. S. Gupta and M. L. Meara (University of Liverpool). *J. Chem. Soc.* **1950**, 1337. The component acids of two specimens of the tallow encasing the seeds of *Sapium sebiferum* (one from Hong Kong, the other from Texas), and also the component acids of a specimen of tallow from *Sapium discolor* have been found to be respectively: lauric, —, 1.5, —; myristic, 0.5, 3.4, 1.7; palmitic, 63.2, 72.1, 46.8; stearic, 7.6, 1.6, 2.9; oleic, 27.1, 20.4, 46.4; linoleic, 1.6, 1.0, 3.1%. The chief component glycerides occurring in the specimens are: *S. sebiferum* (Hong Kong), oleodipalmitin 64, stearodipalmitin 13, tripalmitin 8, and oleopalmitostearin 8%; *S. discolor,* oleodipalmitin 51, palmitodiolein 29, palmito-oleolinolein 6, oleomyristopalmitin 5, and oleopalmitostearin 5%. The stearodipalmitin and oleodipalmitin occurring in *S. sebiferum* have been shown to occur exclusively as symmetrical isomers. Application of the rule of even distribution gives values in fair accordance with the observed values.

Direct esterification of higher fatty acids with glycerol. VII. Esterification of two-component fatty acid mixture into triglyceride. S. Kawai (Kao Soap Co., Mukojima-Ku, Tokyo). *J. Soc. Chem. Ind., Japan* **44**, Suppl. binding 244(1941). Data are presented to show that the direct esterification of 2-component fatty acid mixtures (in molar proportions) into triglycerides with theoretical amounts of glycerol proceeds nonselectively for the individual fatty acid. (*Chem. Abs.* **44**, 8137)

Simple methylated stearic acids. G. Weitzel, A. Fretzdorff, and J. Wojahn. *Naturwissenschaften* **37**, 68-70(1950). A series of 10 monomethylstearic acids were prepared, methyl being substituted on C atom α to κ. In a curve of melting points versus methyl location it appears that a steady drop from α to κ takes place (70 to 10°), probably a minimum at κ or λ and a subsequent rise from ε to π (up to 68°). From C atom α to κ the space requirement for the molecule determined by the Langmuir method on monofilms increases sharply from 18.6 sq. Å for normal stearic to 24 for the α substitute and more gradually to 31 for the κ substitute. Feeding experiments with these acids were conducted on dogs, and no indications were obtained of poor digestibility of these acids. (*Chem. Abs.* **44**, 8137)

Study of ternary mixtures of fatty acids. III. Mixtures of palmitic, stearic, and oleic acids. C. Paquot (Lab. of C.N.R.S., Bellevue, France). *Bull. soc. chim. France* **1950**, 404-5. Ternary mixtures containing palmitic, stearic, and oleic acids can be analyzed through the use of the acid and iodine indexes. The percentage composition is obtained by substitution of these two values into mathematical formulas or through use of a ternary diagram. (*Chem. Abs.* **44**, 8137)

Oil-solvent mixtures—Study of some physical properties. T. K. Ghose (Coll. Eng. Technol., Jadavpur). *Trans. Indian Inst. Chem. Engrs.* **1**, 72-6(1947-48). The density, refractive index, and viscosity were determined for solutions of peanut oil in benzene, toluene, n-hexane fraction (b. 60-80°), monochlorobenzene, trichlorethylene, tetrachlorethylene, and carbon tetrachloride. Deviation of the specific volume from that of an ideal solution was a maximum for all the solvents at 15-30 wt. % of oil in solution, indicating that association occurred between solvent and oil and thus, at these concentrations, maximum penetration of solvent into the nut meal was to be expected. The viscosity data indicated that maximum separation of solution from the meal probably would occur with 10-30 wt. % oil in the solution. (*Chem. Abs.* **44**, 8137)

Hydroxylation of fatty oil. VII. Influence of catalysts on thp hydrogen peroxide-acetic acid method. Y. Ishii (Sugiyama Research Inst. Ind. Chem.). *J. Soc. Chem. Ind., Japan* **46**, Suppl. binding, 165(1943). The mixture (100 g. soybean oil, 28 g. 30% hydrogen peroxide, 20 g. 96% acetic acid) is heated at 100° in the presence of a catalyst. Active catalysts are H_3PO_4, H_2SO_4, $NaHSO_4$, $(NH_4)_2S_2O_8$, $(NH_4)_2MoO_4$, $K_2S_2O_8$, picric acid, H_3BO_3, and oxalic acid.

VIII. Dehydration of hydroxylated oil. *Ibid.* 165-6. The catalytic dehydration of hydroxylated oil, obtained by five different methods, was studied. The same catalysts were used as in the dehydration of castor oil. The dehydrated product is not a good siccative oil.

IX. The oxidation reaction, a secondary reaction of the hydroxylation of fatty oils. *Ibid.* 166. The hydroxylation by peroxy-acids is accompanied by an oxidative splitting of the double bonds. (*Chem. Abs.* **44**, 8138)

Ester interchange between fatty oils and glycerol. IV. Experiments with the mixture of two triglycerides. S. Kawai (Kao Soap Co., Ltd., Mukojima-Ku, Tokyo). *J. Soc. Chem. Ind., Japan* **44**, Suppl. binding 291-2(1941). Treatment of mixtures of 0.01 mole trilaurin/0.01 mole tristearin, 0.01 mole trilaurin/0.01 mole triolein, and 0.01 mole tristearin/0.01 mole triolein for three hrs. at 270-80° with 0.06 mole glycerol and 5% Zn resulted in a selective ester exchange. The reaction products were fractionated with 85% alcohol. The mixtures trilaurin/tristearin and trilaurin/triolein formed predominantly monolaurin while the mixture tristearin/triolein gave mainly monoolein. (*Chem. Abs.* **44**, 7569)

Studies on sorbitol derivatives. I. The direct esterification of sorbitol with higher fatty acids. S. Yamamoto. *J. Soc. Chem. Ind., Japan* **45**, Suppl. binding 381-2(1942). Sorbitol esters of stearic, oleic, and lauric acids and low-boiling fractions of coconut oil were prepared by heating 4 hrs. at 250-60°.

II. The direct esterification of sorbitol with unsaturated higher acids. *Ibid.* 382. Unsaturated acids from sardine oil, linoleic, and ricinoleic acid were esterified with sorbitol to give esters that might be used as drying oils. The drying time of a 50% motor benzene solution of linseed oil was 32 hrs. compared to 28 and 25 hrs. for the esters of sardine oil and linoleic acid, respectively. (*Chem. Abs.* **44**, 7568)

Iodine number and thiocyanogen number of lanolin. W. Ganssle (Woll-Wascherei u. Kammerei, Dohren bei Hannover, Germany). *Fette u. Seifen* **52**, 164(1950). The iodine number of lanolin increases with the amount of excess iodine available during analysis. The thiocyanogen number was found to be reasonably constant regardless of the excess of thiocyanogen used. (*Chem. Abs.* **44**, 7567)

Analytical behavior of synthetic fatty acid glycerides. E. Kuntz. *Deut. Lebensm.-Rundschau* **44**, 1-6, 27-9(1948). Complete analysis of a typical synthetic fat is described and results are tabulated. Certain substances, in natural fats, present in rather small amounts, but of importance from the standpoint of the physiological aspect of food, are not present in the synthetic product such as vitamins, sterols, phosphatides, and coloring matter. (*Chem. Abs.* **44**, 7566)

THE MECHANISM OF HYDROLYSIS OF FATS AND OILS BY AUTOCLAVE. I. INTERMEDIATE HYDROLYTIC PRODUCTS OF COCONUT OIL. C. Yonase. *J. Nippon Oil Technol. Soc.* **3**, No. 1/2, 15-24 (1950). Estimation of acetyl nos. after hydrolysis of coconut oil at 200° and 34 kg./sq. cm. pressure for 10-180 minutes in a stainless steel autoclave without catalyst, indicated that the acceleration is due to the formation of an intermediate product having an OH group. In general, glycerides of lower fat acids hydrolyzed faster than those of higher fat acids.

II. HYDROLYSIS OF COCONUT OIL IN IRON AUTOCLAVE WITH HYDROGEN AND PRESSURE. *Ibid.*, 24-37. In the hydrolysis with an equal amount of water at 180° and 26-71 kg./sq.cm. pressure, the rate decreased after 120-150 minutes. The same test with stainless steel showed a slower rate of hydrolysis. This is due to the catalytic action of Fe dissolved during the hydrolysis. The product contained 1.87% Fe. (*Chem. Abs.* **44**, 7565)

LIMITS OF THE DETECTION OF GLYCOLS IN GLYCEROL BY THE METHOD OF E. KROLLER. R. Neu (Weidenbaumsweg 133, Hamburg-Bergedorf, Ger.). *Pharamazie* **5**, 217-18(1950). The lower limits for the detection of glycols in glycerol are: ethylene glycol, 0.4%; 1,2-propylene glycol, 1.2%; 1,4-butylene glycol, 2%. The reaction can probably also be used for 1,3-trimethylene glycol. (*Chem. Abs.* **44**, 7188)

THE SEPARATION OF THE C_{12}-C_{18} FATTY ACIDS BY REVERSED PHASE PARTITION CHROMATOGRAPHY. G. A. Howard and A. J. P. Martin (Lister Inst., London). *Biochem. J.* **46**, 532(1950). *A new method of partition chromatography is described in* which paraffin or similar non-polar material supported on a dichlorodimethylsilane-treated diatomaceous earth is used as the stationary phase and aqueous acetone or methanol as the moving phase. Excellent separations were obtained on saturated fatty acids, and in one experiment it was demonstrated that acids with different degrees of unsaturation but the same chain length are separable with this system. Samples as small as 2 mg. can be easily handled in the apparatus described.

LORENTZ-LORENZ EXPRESSION AS AN ANALYTICAL CONSTANT FOR OILS AND FATS. M. R. Nayar, S. C. Roy, and R. S. Srivastava (Lucknow Univ.). *Current Sci. (India)* **19**, 54-6(1950). Data are given for mustard oil and groundnut oil (a common adulterant) which show that the limits of the standard can be brought to a narrower range by using the Lorentz-Lorenz formula: $(n^2 - 1)/(n^2 + 2)$ $(1/d)$ where n is the refractive index and d is the density. A quantitative relation exists between this constant and the concentration of the adulterant. (*Chem. Abs.* **44**, 6657)

KINETIC STUDY OF THE ESTERIFICATION OF THIODIGLYCOL BY ENANTHIC, LAURIC, AND ADIPIC ACIDS. J. Colonge and P. Stuchlik (Faculte sci., Lyons, France). *Bull. soc. chim. France* **1950**, 267-71. The esterification of thiodiglycol with equimolar amounts of enanthic, lauric, and adipic acids was studied in an apparatus that removes water continuously by distillation. The rate of the reaction with lauric is somewhat less than that with enanthic. The rates of esterification of thiodiglycol and diethyleneglycol with enanthic acid at 177° are the same. (*Chem. Abs.* **44**, 7765)

HYDRAZIDES OF SOME FATTY ACIDS AND THE HYDROGENATING ACTION OF HYDRAZINE HYDRATE ON OLEIC AND LINOLEIC ACIDS. K. Pajari (Grosseinkaufsgenossenshaft finnischer Handelsgenossenschaften, Helsinki, Finland). *Fette u. Seifen* **51**, 347-51 (1944). Hydrazides of some higher fatty acids have been prepared and are listed below, followed by m.p. and solubility in 96% ethanol at 19° (given in mg./100 ml.) lignoceric, 115.0-16.5°, 3.5; stearic, 115.0-16.2°, 29.5; palmitic 111.5-12.5°, 90.5; myristic, 108.0-9.0°, 246; lauric, 104.0-5.0°, 690; hendecanoic 101.0-2.0°, 995; capric, 96.5-7.5°, 1692; pelargonic, 94.5-5.5°, 3339; caprylic, 88.5-9.5°, 5390. Mixtures of any of these hydrazides could be separated by means of their different solubility. Oleic and linoleic acids are slowly hydrogenated by hydrazine hydrate, the reaction proceeding farther when an alcohol of higher molecular weight is used than when one of *lower molecular weight is used.* (*Chem. Abs.* **44**, 7764)

OXIDATION OF SATURATED FATTY ACIDS. I. OXIDATION OF LAURIC ACID. II. OXIDATION OF STEARIC ACID. H. Nobori (Kao Soap Lab. A.-G., Tokyo). *J. Soc. Chem. Ind., Japan* **45**, Suppl. binding, 453(1942). Lauric acid was scarcely affected by blowing with air up to 150° in the presence of 0.1% $KMnO_4$. Stearic acid was broken down to lower fatty acids and products which contained hydroxyl groups and lactones by the same treatment. (*Chem. Abs.* **44**, 7568)

THERMAL DECOMPOSITION OF FAT ACIDS. I. THERMAL DECOMPOSITION OF COCONUT-OIL FAT ACID WITH ACTIVATED ACID CLAY. T. Tokunaga (Osaka Univ., Japan). *J. Nippon Oil Technol. Soc.* **3**, No. 1/2, 37-48(1950). Decarboxylation, dehydration, and dehydrogenation were most satisfactory with bauxite. Kaolin and bentonite gave a poor decarboxylation but were good for dehydration and dehydrogenation. In all cases heating at 450-500° for 40-80 minutes gave the highest decomposition. Below 450° the dehydration and dehydrogenation were not effected while above 500° larger amounts of gaseous product were obtained.

II, III. THERMAL DECOMPOSITION OF COCONUT-OIL FAT ACIDS BY USE OF A MIXTURE OF ACTIVATED ACID CLAY AND LIME. *Ibid.* 49-59, 60-8. The production of olefins C_8 to C_{16}) was best when *fat* acids were heated at 450-500° for 40 minutes with a catalyst composed of 75% acid clay and 25% CaO.

IV. THERMAL DECOMPOSITION OF COCONUT-OIL FAT ACIDS WITH BARIUM OXIDE. *Ibid.* 69-78. About 10-15% BaO in acid clay gave the same result as that containing 25% CaO. The product contained, besides olefins, saturated hydrocarbons and aldehydes or ketones.

V. THERMAL DECOMPOSITION OF PALM AND CHRYSALIS OIL. *Ibid.* 79-88. The yield of olefins was better on palm oil than chrysalis oil. Since chrysalis oil contained more than 2 double bonds, it had a tendency to crack into low molecular weight hydrocarbons. (*Chem. Abs.* **44**, 7568)

OCTYL ALCOHOL FROM REDUCTION OF COCONUT-OIL-FAT ACIDS AT HIGH TEMPERATURE AND PRESSURE. PRELIMINARY REPORT. T. Kohashi, S. Kimura, and N. Matsui. *J. Nippon Oil Technol. Soc.* **3**, No. 1/2, 9-15(1950). The ethyl ester of the lower fatty acids of coconut oil heated at 280° and 100 atm. for 1.5 hrs. with 7% Cu-Cr oxide yields 12.8% octyl alcohol, based on the weight of the coconut oil. (*Chem. Abs.* **44**, 7752)

PREPARATION OF OLEIC ACID WITHOUT THE USE OF DISTILLATION. A. Preobrajenski (Bibliographic Service of ITERG, Paris). *Bull. mens. ITERG* **4**, 215-21(1950). A review comprising technical and analytical processes; 30 references. (*Chem. Abs.* **44**, 7764)

LIPIDS OF SOYBEAN OIL. K. H. Bauer and Y. Yen-Hou (Univ. Leipzig, Germany). *Fette u. Seifen* **51**, 301-7(1944). The amount of unsaponifiable matter is highest in germinated *roots and lowest in the oil of ripe seeds.* The unsaponifiable matter contains stigmasterol, sitosterols (the major portion), and hydrocarbons. The hydrocarbons (all unsaturated) are liquid in seed oil, solid in germinated root oil, and semi-solid in germinated cotyledon oil. (*Chem. Abs.* **44**, 7569)

PATENTS

TREATMENT OF GLYCERIDE OILS. K. F. Mattil (Swift & Co.). *U. S. 2,518,917.* The cold test of a glyceride oil is improved by incorporating therein a small amount of a hydroxyaromatic compound containing not more than 3 benzene rings in which at least 3 hydrogen atoms of the hydroxyaromatic compound are replaced by alkyl groups containing at least 20 carbon atoms.

CONDENSATION PRODUCTS OF DIAMINES AND FATTY ACIDS. P. F. Tryon (Commercial Solvents Corp.). *U. S. 2,520,102.* A composition of matter is claimed comprising an association product of a fatty acid with an imidazoline derivable from the fatty acid, in admixture with a quantity of the imidazoline in unassociated form.

PREPARATION OF DIGLYCERIDES. E. B. Kester (U.S.A.). *U. S. 2,523,309.* Symmetrical diglycerides are formed by heating a *reaction mixture consisting of a fatty acid and a fatty glycidyl* ester at 50 to 200°.

SOLVENT REFINING OF FATTY OILS. H. J. Passino (M. W. Kellogg Co.). *U. S. 2,523,630.* An improvement in the process for refining fatty oils with propane is described in which a portion of the raffinate is recycled to the extraction column.

ESTER CONDENSATION. D. E. Floyd (General Mills Inc.). *U. S. 2,523,692.* The oxalyl derivative of a fatty acid is formed by heating a low molecular weight diester of oxalic acid with a low molecular weight ester of a fatty acid in the presence of an approximately equal amount of alkaline condensing agent based on the fatty acid ester. The low molecular weight alcohol formed during the reaction is distilled off.

SEPARATION OF UNSAPONIFIABLE MATERIALS FROM FREE FATTY ACIDS. H. A. Vogel (Pittsburgh Plate Glass Co.). *U. S. 2,523,794.* A process is described for obtaining a sterol concentrate by forming the ammonium soaps of a natural fat, dissolving these soaps in an organic solvent, and chilling this solution to precipitate out the ammonium soaps leaving a concentrated sterol solution.

• Biology and Nutrition

R. A. Reiners, Abstractor

COTTONSEED FEEDING TO MILCH ANIMALS. III. EFFECT OF LARGE INGESTION OF OIL THROUGH COTTONSEED ON THE SECRETION AND STABILITY OF CAROTENE AND VITAMIN A IN COW BUTTERFAT. B. M. Patel and S. C. Ray. *Indian J. Dairy Sci.* **2**, 146-53(1949). The absorption and secretion in butterfat of carotene and vitamin A are inefficient when the ration is predominantly cottonseed, which is ascribed to the large oil content or to some unknown factor in the seed. However the feeding of concentrate containing cottonseed confers greater stability to the butterfat against oxidation. (*Chem. Abs.* **44**, 8016)

UTILIZATION OF ACETATE FOR MILK-FAT SYNTHESIS IN THE LACTATING GOAT. G. Popjak, T. H. French, and S. J. Folley (National Inst. of Med. Res., London). *Biochem. J.* **46**, XXVIII(1950). An hour after the intravenous injection of $C^{14}H_3CO_2Na$, the C^{14} was found in the milk and in 3-4 hours the maximum was reached. The specific activity of the steam-volatile fatty acids at their maxima was several times that of the long chain fatty acids, indicating that the volatile acids could not have originated from the degradation of the long-chain fatty acids.

CONVERSION OF CAROTENE TO VITAMIN A IN THE INTESTINE OF THE PIG AND OF THE RAT: TRANSPORT OF VITAMIN A BY THE LYMPH. M. E. Coates, S. Y. Thompson, and S. K. Kon (University of Reading). *Biochem. J.* **46**, XXX(1950). Data are presented in this paper which together with that reported previously make it clear that vitamin A arising from carotene in the intestine is carried thence by the lymph to the blood and by the blood to the liver. The vitamin A was almost exclusively in the ester form.

CONJUGATED LINOLEIC ACID IN RAT TISSUE LIPIDS AFTER INGESTION AS FREE ACID AND AS TRIGLYCERIDE. R. Reiser (Texas Agri. Exp. Station). *Proc. Soc. Exp. Biol. Med.* **74**, 666(1950). The glycerides are absorbed more rapidly and possibly more completely than the free fatty acids, but the pathways of absorption are the same.

THE PROBLEM OF SUFFICIENT NOURISHMENT IN TIME OF FAMINE. II. SIGNIFICANCE OF FATS IN THE DIET AND THE INFLUENCE OF INTACT CELLS ON THE UTILIZATION OF SOYBEAN OIL. H. Meyer-Brunot, G. Wicke, and H. Wallach (Univ. Marburg, Germany). *Deut. Arch. klin. Med.* **194**, 707-18(1949). Self-experimentation showed that a vegetable diet up to 3,000 calories is still insufficient if deficient in fats. When 20 g. animal fat was added to the diet, 91-95% was utilized. If the fat consisted partly of soybean oil (51-75%), the fraction utilized was lower by 5-10%; most of the loss was due to the fat content of intact cells passed in the stool. (*Chem. Abs.* **44**, 7947)

THE REPRODUCTION ABILITY OF RATS MAINTAINED ON A FAT-RICH DIET FORTIFIED WITH GROWTH SUBSTANCES. Beth v. Euler, H. v. Euler, and Greta Lindeman (Univ. Stockholm). *Arkiv Kemi* **1**, 541-4(1950). Various groups of rats were fed a basic diet containing the known vitamin supplements, and their weight increase and fertility data were in agreement with other laboratories. However these groups were found to be lacking in at least one growth factor necessary for optimum development and reproduction, which is available in the mixed-feed diet of the normal rats. The growth factor of skim milk as well as the reproduction effect of Co and its complex salts is under investigation. (*Chem. Abs.* **44**, 7397)

FAT ABSORPTION AND SOME OF ITS PROBLEMS. H. S. Raper (Univ. Manchester, England) (*Brit. Med. J.* **1949**, II, 719-24. An address. (*Chem. Abs.* **44**, 7394)

THE INFLUENCE OF DISPERSION UPON THE ABSORPTION OF VITAMIN A AND FAT AS STUDIED BY FLUORESCENCE MICROSCOPY. B. W. Volk and H. Popper (Cook County Hosp., Chicago). *Gastroenterology* **14**, 549-57(1950). Studies with fluorescence microscopy revealed that absorption of vitamin A or fat in the rat intestine is faster and quantitatively more efficient if it is given in aqueous dispersions instead of in oil solutions. Apparently three times as much is absorbed from the aqueous as from the oily menstruum. If excessive doses of vitamin A or relatively large amounts of fat are administered, temporary storage of the lipids occurs in the lamina propria of the villi. Choline administration does not hasten the release of the lipids from the intestine nor does it increase vitamin A absorption. Experimental liver damage due to acute CCl_4 intoxication has no demonstrable influence upon vitamin A absorption. (*Chem. Abs.* **44**, 7392)

TOXICITY OF NICKEL. S. S. Phatak and V. N. Patwarhan (Nutrition Research Lab., Coonoor). *J. Sci. Ind. Research (India)* **9B**, No. 3, 70-6(1950). The toxicity of Ni was tested because of the possible contamination of hydrogenated oils. Rats and monkeys were fed Ni catalysts, Ni soaps, and $NiCO_3$ at levels of 100, 50, and 25 mg. per 100 g. of basal diet. Growth rate and reproduction were not significantly affected, and no toxic symptoms developed in rats after three to four months of continuous feeding. Approximately 71 to 91% of ingested Ni was found in the feces. Appreciable quantities were retained in the tissues. Arranged in order of decreasing Ni content these are bone, spleen, kidney, heart, intestine, blood, and testes. Retention was highest with $NiCO_3$. Adult monkeys maintained their weight and were in perfect health after six months on Ni-containing diets. (*Chem. Abs.* **44**, 7994)

PHYSICOCHEMICAL DETERMINATION OF VITAMIN E. P. Forjaz (Acad. Sci., Lisbon, Portugal). *Anais Azevedos (Lisbon)* **2**, 22-7(1950). Concentrations of γ-tocopherol could be determined spectrophotometrically in the presence of α-tocopherol if extinction coefficients for both α- and γ-tocopherol were determined at 420 $m\mu$ and 490 $m\mu$ and Beer's law applied to the two-component system. (*Chem. Abs.* **44**, 7921)

STUDIES ON GOSSYPOL IN RELATION TO ARGENTINE RAW MATERIALS. R. J. Bacha (Univ. La Plata, Argentina). *Rev. facultad. cienc quim. (Univ. nacl. La Plata)* **22**, 255-7(1947). The average gossypol content of 10 pure varieties of Argentine cottonseed was 0.385%. No gossypol could be detected in refined cottonseed oil with the methods employed. Addition of gossypol (in 0.54% final concentration) to refined cottonseed oil retarded oxidative rancidity of these products. (*Chem. Abs.* **44**, 7570)

THE CONTENT OF TOCOPHEROLS IN ARGENTINE WHEAT-GERM OILS. O. R. Vera (Univ. La Plata, Argentina). *Rev. facultad. cienc. quim. (Univ. nacl. La Plata)* **22**, 231-9(1947) (Pub. 1949). The tocopherol content of Argentine wheat-germ oils obtained from five different Argentine mills was determined by the method of Parker and McFarlane. The tocopherol content varied from 0.319 to 0.385% by weight. Analytically suitable conditions for the saponification of *dl*-tocopherol acetate in a stream of N with a small excess of KOH are described. (*Chem. Abs.* **44**, 7461)

NUTRITIVE VALUE AND FATTY ACID MAKE-UP OF FRACTIONS OF BUTTERFAT PREPARED BY CRYSTALLIZATION. V. R. Bhalerao and K. P. Basu. *Indian J. Dairy Sci.* **2**, 154-9(1949). The liquid acetone-soluble fraction of cow butterfat induced a better growth in rats than either the solid fraction or butterfat itself. The higher concentration of the lower fatty acids in the liquid fraction or the presence of a growth-promoting factor may be responsible. (*Chem. Abs.* **44**, 8013)

DETERMINATION OF FATS IN PREPARED FOODS BY NONACID GERBER METHOD. G. M. Egiazarov. *Gigiena i Sanit.* **1950**, No. 5, 45-7. The method outlined by Gologorskii and Kagan is satisfactory, provided a saturated Na_2CO_3 solution is used and the food sample is thoroughly agitated with the carbonate solution. (*Chem. Abs.* **44**, 8012)

COLORIMETRIC INDEX OF THE ACIDIFICATION OF THE LIPIDS OF BUTTER. E. Goiffon. *Lait.* **29**, 466-76(1949). The principle of the procedure consists in adding to a solution containing the fatty acids from the butter, Na_2CO_3 and successive quantities of Nile blue until the appearance of the rose alkaline form which takes the coloring when it is not combined with the fatty acids. (*Chem. Abs.* **44**, 8013)

THE GERBER METHOD FOR DETERMINING THE BUTTER FAT CONTENT OF MILK. H. Mulder and L. Radema (Lab. Rijks Landbouwproefsta., Hoorn, Netherlands). *VII° Congr. intern. inds. agr., Paris* **1948**, Q2, K1-3. The fat content of milk found by the Gerber method (G) is not correct. Compared with the numbers found by the Rose-Gottlieb method (RG) the following equation exists: $G = 1.040\ RG - 0.070$. (*Chem. Abs.* **44**, 8012)

RESURVEY OF NUTRITION IN NEWFOUNDLAND IN 1948. N. Jolliffe (Dept. of Health, New York, N. Y.). *J. Amer. Dietetic Assoc.* **26**, 161-7(1950). The fortification of margarine with vitamin A and the enrichment of flour with riboflavin, niacin, and thiamine over a 4-yr. period improved the nutritional status of the population group studied. (*Chem. Abs.* **44**, 7393)

FATS AS FOODS. HEATED FATS AS A POSSIBLE SOURCE OF CARCENOGENS. P. R. Peacock (Roy. Cancer Hosp., Glasgow). *Brit. J. Nutrition* **2**, 201-204(1948). Cottonseed oil and cholesterol were heated from 270-380° for 60 to 90 minutes and injected into mice. Sarcomas were found in two of seven mice given cottonseed oil and in two of 12 given cholesterol. There were no tumors in the 149 controls. (*Biol. Abs.* Sect. G. **24**, (6), 34)

New margarine plant sets quality pace. E. D. White. *Food Ind.* **22**, 1538(1950). A new plant is described.

Salad oil from rice bran. J. A. Lee. *Chem. Eng.* **57**, (9), 123 (1950). A plant in which rice bran is continuously hexane-extracted is described. Rice oil makes a very stable salad oil.

"Modern" soybean: Key to "modern" margarine. J. P. Whitehurst (Miami Margarine Co.). *Soybean Digest* **10**, (11), 66(1950). The use of soybean oil in the manufacture of margarine is discussed.

Vegetable oils that are detrimental to health. C. Griebel, A. Zeisset, and I. Hecht (Inst. Lebensm., Arzneimittel, Gerichtl. Chem., Grosz Berlin). *Deut. Lebensm.-Rundschau* **43**, 123-6(1947). The great lack of fats in Germany during the war was the cause of widespread adulteration of vegetable oils. A large number of samples were received with complaints of severe vomiting and diarrhea after consumption. The oils were of a brownish yellow color, fairly viscous, of a peculiar lardy smell, and had a high refraction (90). The saponification index was 187.9, acid no. 13.8, and n_D^{20} 1.517, indicating an euphorbiaceous oil. Microscopic examination showed the characteristic tungoil crystals, after drying. The diene no. was 59.6-60 for all the samples, which proved that they all were of the same origin. Heating the oil with potatoes or bread did not remove the toxic effects. (*Chem. Abs.* **44**, 7569)

Spectrophotometric studies of the oxidation of fats. IX. Coupled oxidation of vitamin A acetate. R. T. Holman (Texas Agri. Exp. Station). *Arch. Biochem.* **26**, 85(1950). Study of the oxidation of vitamin A acetate in purified methyl linoleate indicated that virtually all of the vitamin A is destroyed before 10% of the linoleate is oxidized. The course of oxidation of both the linoleate and the vitamin A acetate is the same regardless of whether they are oxidized together or separately.

Research affecting the feeding of soybean oil meal. J. W. Hayward (Archer-Daniels-Midland Co.). *Soybean Digest* **10**, (11), 30(1950). Recent progress in animal nutrition is reviewed.

Biological facts on vaccenic acid. B. v. Euler, H. v. Euler, and G. Lindeman (Stockholm Univ.). *Arkiv. Kemi. Mineral. Geol.* **26B**, No. 3, 1-5(1948). Weanling rats were kept on a basal diet containing 9% margarine or rapeseed oil for four weeks. Half the animals were then given a diet supplemented with about 60 mg. vaccenic acid per rat per day for eight weeks. Vaccenic acid did not show any significant growth promoting effect. (*Chem. Abs.* **44**, 7397)

In Vitro digestibility of soy products. Anon. *Nutrition Rev.* **8**, 286(1950). In the evaluation of the digestibility of soybean products the use of *in vitro* techniques is not justified without further experimentation relative to inactivation of interfering enzymes.

Formation of milk fat. K. Taufel (Inst. Ernahrung u. Verpflegungswissenschaft, Potsdam-Rehbrucke, Germany). *Fette u. Seifen* **52**, 9-10(1950). Human and animal milk fats appear to have several sources, such as fat deposits, fat circulating in the bloodstream, or products of intermediate metabolism. (*Chem. Abs.* **44**, 7457)

Production of acetate from fatty acids by neurospora. J. Lein and P. S. Lein (Syracuse U.). *J. Bact.* **60**, 185(1950). A *Neurospora* mutant was isolated that could not grow unless supplied with acetate. This mutant could obtain its acetate from the degradation of fatty acids, and it was found that all of the naturally occurring fatty acids tested except palmitic and stearic acids could be used as acetate sources.

Investigation of microbiological fat formation. R. Koch, F. Thomas, and E. E. Bruchmann (Inst. Garungsgewerbe u. Starkefabrikation, Berlin). *Branntweinwirt.* **3**, 65(1949). Fat production by a fat-building yeast improved with increased aeration. One liter of nutrient broth yielded 10 g. dry yeast containing 4.9 g. crude fats in 48 hours. The fat coefficient reached the theoretical value of 15.3, and the sugar was completely consumed. The dried yeast contained 25.3% crude fat and 12.4% protein. This yeast was dried on rollers and had a pleasant peanut-like taste. (*Chem. Abs.* **44**, 7929)

PATENTS

Stable injectable oil-pectin therapeutic compositions. H. Welch. *U. S. 2,518,510.* An injectable penicillin composition is disclosed which consists of finely divided penicillin suspended in peanut oil, in which colloidal pectin is dispersed. From 5-10% of hydrogenated peanut oil is added as a suspension stabilizer.

• Detergents

Lenore Petchaft, Abstractor

Solubilization in alcohol-soap micelles. H. B. Klevens (University of Minnesota, St. Paul, Minn.). *J. Am. Chem. Soc.* **72**, 3581-6(1950). The use of long-chain alcohols, n-heptanol through n-dodecanol, as additives has been found markedly to increase the solubilization of n-heptane in potassium n-tetradecanoate solutions. Long-chain alcohols used as additives have a much greater enhancement of solubilizing power than equivalent amounts of added soaps of the same chain length. When the polar group on the additive is changed, it is found that for equal chain lengths $-COO- < -OH < -NH_2 < -SH$ in the enhancement of solubilization. This is explained by a greater penetration into the palisade layer of the soap micelle of these various polar compounds in the same order noted in the increase in solubilizing power. This is in agreement with the attraction of these polar groups for the water layer due to the high dipole moment of the latter.

Solubility of some sodium soaps in pinene. G. S. Hattiangdi (Univ.. of S. California, Los Angeles). *Proc. Indian Acad. Sci.* **30A**, 320-6(1949). The solubility of Na oleate, stearate, and palmitate in pinene was determined from 30 to 150°. The solubilities of the soaps decrease in the order: oleate, stearate, and palmitate. A kink in the curves at 100 to 110° can be interpreted on the basis of the vapor-pressure data to show true solution above this temperature and micelle formation below this temperature. A partial temperature-composition phase diagram was constructed. (*Chem. Abs.* **44**, 7124)

The alpha phase of sodium dodecyl sulfate. Floyd Rawlings Jr. and E. C. Lingafelter (Univ. of Washington, Seattle). *J. Am. Chem. Soc.* **72**, 1852(1950). X-ray diffraction data were obtained from rotation, Weissenberg, and precession photographs with Cu radiation. The sulfate crystals were very similar in habit to those of the α-phase of Na alkane sulfonates. The constants for the monoclinic unit cell were in agreement with those of the sulfonates. (*Chem. Abs.* **44**, 7118)

Measuring water softening capacity of dishwashing compounds. Rubin Bernstein (Industrial Test Laboratory, Philadelphia Naval Shipyard) and Harry Fleisher (Bureau of Ships, Navy Dept., Washington, D. C.). *Soap Sanit. Chemicals.* **26**, No. 9, 40-1, 82, 153(1950). A method for measuring water softening capacity, applicable to dishwashing compounds and sequestering agents, has been developed which is rapid and reproducible. The method is based on the detection of turbidity produced by the addition of soap to a solution of compound in hard water. The absence of turbidity indicates complete softening of the water. Several dishwashing compounds and sequestering agents were tested for minimum concentration required to soften water of varying hardness. The increasing order of effectiveness for the sequestering agents is: tetrasodium pyrophosphate, sodium tripolyphosphate, sodium tetraphosphate, tetrasodium salt of ethylene diamine tetracetic acid, and sodium hexametaphosphate.

Pioneer surfactant. M. L. Kastens and J. J. Ayo. *Ind. Eng. Chem.* **42**, 1626-38(1950). The history of development of synthetic detergents and the American producers of them are reviewed. All phases of manufacture of Igepon T including production of gel and powder forms and commercial types are discussed. 20 references.

Some properties of the condensation products of amino and fatty acids. M. Naudet (Lab. natl. matieres grasses, Marseille). *Bull. soc. chim. France* **1950**, 358-61. Alanine and palmityl chloride in NaOH solution give N-palmityl-alanine, m. 116 to 117°. Similarly are prepared N-laurylalanine, m. 95 to 6°, N-palmitylserine, m. 99 to 9.5°, N-laurylserine, m. 116 to 118°, N-oleylalanine, and N-oleylleucine; the last two crystallize only at —20° from acetone. The condensation products are somewhat stronger acids than the fatty acids hence their Na salts can exist at lower pH than soaps. The effects of these compounds are compared with those of soaps and Na alkyl sulfates on aqueous surface tension and on the interfacial tension between water and toluene. All are good detergents (Chem. Abs. **44**, 8137)

Surface-active agents. I. Introduction to detergency. A. Lawrence Waddams. *Soap, Perfumery, Cosmetics* **23**, 915-18, 941(1950). Review article covering theory of surface activity, the detergent process, evaluation of detergents, explanation of emulsification, and classification of the many types of commercial surface-active agents.

Detergents. Norman J. Harper. *Pharm. J.* **164**, 265-7 (1950). Classification of surface-active agents, their pharmaceutical applications, antibacterial activity, toxicity, use in cosmetics, and soap substitutes are discussed. (*Chem. Abs.* **44**, 7487)

TECHNICAL PROPERTIES OF MIXTURES OF SOFT SOAP WITH SYNTHETIC DETERGENTS. G. Reutenauer (Lab. Chevreul, Paris). *Bull. mens ITERG.* **4**, 257-62(1950). The synthetic detergents (5 to 10%) were mixed with K soap containing 40% fatty acids. Solutions containing 0.5, 1.0, and 1.5% of active substance were prepared from the detergent, the soap, and their mixture. The wetting power of the soap towards cotton is sensibly improved by the presence of a detergent, but the emulsifying power, resistance to hard water, and frothing are about the same. (*Chem. Abs.* **44**, 7571)

ANALYSIS OF COLLOIDAL ELECTROLYTES BY DYE TITRATION. H. B. Klevens (Univ. of Minnesota, St. Paul, Minn.). *Anal. Chem.* **22**, 1141-44(1950). The determination of total amount of surface-active material present in a system can be obtained by titration with a suitable dye solution. Anionic soaps can best be determined with cationic dyes, and cationic soaps with anionic dyes. Total amount of surface-active components as well as the amount of each component can be determined in soap mixtures, in soap-electrolyte systems, and in soap solutions containing other materials such as hydrocarbons, polar compounds, latices, and various adsorbents if the proper experimental techniques are employed. In the case of determinations in turbid or slightly colored media, reproducible results were obtained only with dyes that show changes in fluorescence intensity. Experimentally, the most consistent data were obtained by observations made in a darkened room, using a narrow beam of light falling on a thin layer of the soap solution.

TITRIMETRIC SOAP ANALYSIS. Curt Fuchs (Fa. Dreiringwerke KG., Krefeld-Linn, Germany). *Fette u. Seifen* **52**, 23-6, 105-8 (1950). A sample (4 g.) of unfilled soap in 100 ml. neutralized 80% EtOH is titrated with 0.2 N acid to the phenolphthalein endpoint and then with 0.5 N alcoholic HCl to the bromophenol blue endpoint (yellow). Total fatty acids are determined in soaps containing lauric or synthetic fatty acids by spotting with mineral acid, extracting with ether, extracting the aqueous layer repeatedly with ether, washing the combined ether extracts with saturated NaCl solutions, and evaporating the ether. Mersolates are determined by difference. (*Chem. Abs.* **44**, 7570)

SPRAY DRIED WASHING POWDERS. Anon. *Soap Sanit. Chemicals* **26**, No. 9, 61, 63(1950). The cold spray and hot spray methods of producing washing powders are reviewed. In the cold spray process, in which the water content of the product is bound by crystallization, powders are prepared with a fatty acid content up to 30% and a water content of 30 to 35%. Powders prepared by the hot spray method, in which the water is removed by drying, have a water content of about 5 to 8%. This method is particularly suited to preparing shampoos and other products which require a high content of detergent.

TEXTILE SOAPS. Milton A. Lesser. *Soap Sanit. Chemicals* **26**, No. 9, 36-9, 141, 143(1950). A review of the role soap or synthetics play in textile industry. The new development of using soap-synthetic mixtures is discussed.

FLORAL AND FANCY PERFUMES FOR SOAPS. T. Ruemele. *Perfumery Essent. Oil Record* **41**, 288-9(1950). Formulations for various soap perfumes.

PATENTS

NON-CAKING ALKARYL SULFONATE DETERGENT COMPOSITION. William F. Waldeck (Wyandotte Chemicals Corp.). *U. S. 2,515,577.* Caking, agglomeration and deterioration of spray-dried alkyl-aryl sulfonate detergents is prevented by use of a small amount of a sodium silicate having a Na_2O/SiO_2 mol ratio of from 1/2 to 1/2.85.

DETERGENT SANITIZER COMPOSITION. A. S. Du Bois (Onyx Oil & Chemical Corp.). *U. S. 2,519,747.* An effective hard water detergent sanitizer in the form of a free flowing powder consists of a quaternary ammonium compound such as oleyl dimethylethyl ammonium bromide, a non-ionic detergent such as the nona-ethylene glycol mono ester of soybean fatty acids, and compatible alkali salts such as sodium carbonate and tetrasodium pyrophosphate.

BACTERICIDAL DETERGENT BRIQUETTE. James Douglas MacMahon (Mathieson Chemical Corp.). *U. S. 2,519,841.* A stable, hard, strong, and non-deliquescent detergent briquette having bactericidal properties was prepared. A quaternary ammonium compound with a long chain alkyl radical was incorporated (0.2 to 10%) into a detergent composition consisting of such substances as sodium carbonate, trisodium phosphate, sodium silicate, and various polyphosphate compounds.

METHOD FOR PRODUCING DETERGENT BLOCKS. Robert J. Short and George M. Woodruff (Procter & Gamble Co.). *U. S. 2,520,570.* Process for the manufacture of formed cakes of detergents containing distinctive colored inserts without forming a cavity for the insert in a separate operation with a separate die.

HAND CREAM DETERGENTS. J. H. Wootton-Davies (Peter Lunt & Co. Ltd.). *British 639,630.* A jelly-like detergent adapted for extrusion from a collapsible tube was prepared by mixing a vegetable oil saponified with caustic potash with an emollient such as glycerol or glycol, an alkaline buffering agent, a bactericidal agent such as a chlorinated phenol, and a mild abrasive.

• Waxes

E. H. McMullen, Abstractor

NEUTRAL COMPONENTS OF CORK WAX. F. Sorm and V. Bazant (Tech. Univ., Prague). *Collection Czechoslav. Chem. Communs.* **15**, 73-81(1950). Cork prepared from the bark of *Quercus suber* averages 20% neutral components by cold extraction with EtOH-C_6H_6. Chromatographic separation produces a mixture of friedelin, cerin, $C_{24}H_{50}O$, and paraffinic alcohols. A tricyclic $C_{20}H_{36}O$ saturated alcohol and a $C_{30}H_{52}O_2$ triterpene dialcohol and a $C_{30}H_{50}O_3$ triterpene hydroxy ketone were found in succeeding fractions. A diterpene fraction which may be $C_{20}H_{34}O$ or $C_{25}H_{42}O_2$ was isolated which melted at 290-2° and had an approximate molecular weight of 347. (*Chem. Abs.* **44**, 8139)

RICE WAX. I. Riichiro Yamazaki and Goro Ogawa (Osaka Municipal Inst. Ind. Research). *J. Soc. Chem. Ind. Japan* **44**, Suppl. binding, 241(1941). The muddy deposit from crude rice-bran oil was found to be wax. The unsaponified matter was melissyl alcohol 45, ibotaceryl alcohol 10, ceryl alcohol 22, sitosterol 3, and unidentified 20%. (*Chem. Abs.* **44**, 8139)

IMPROVEMENT OF HYDROGENATED RICE WAX. S. Komatsu. *J. Nippon Oil Technol. Soc.* **3**, No. 1/2, 141-5(1950). Refining of hydrogenated rice wax by use of a solvent is described. The color in the wax could not be removed by a solvent. (*Chem. Abs.* **44**, 7570)

APPLICATION OF CHLOROWAX TO PROTECTIVE AND DECORATIVE COATINGS. K. S. Wade. *Off. Dig. Paint Varn. Prod. Cl.* **No. 295**, 497-503(1949). The properties of two grades of chlorinated paraffin containing 40 and 70% of Cl_2, respectively, are described. Suitable paint and varnish uses and formulations for emulsion paints, fire-retardant paints, alkyd systems, and stoving enamels incorporating these compounds are given. (*Brit. Abs.* B II, **1949**, 498)

FLEXIBILITY OF MICROCRYSTALLINE WAX. A. Kinsel and H. Schindler. *Paper Trade Journal* **126**, TAPPI Section, 176-8 (1948). The number of bends of an extended cylinder of the sample necessary to cause rupture is determined. Data for 11 different types of waxes are tabulated. The prediction of the flexibility from the melting-point or A.S.T.M. (D5-25) penetration tests alone is not possible. (*Paint Tech.* **15**, No. 176, 357)

DETERMINATION OF OIL IN PARAFFIN WAXES. C. W. Layton (Standard Oil of California). *Anal. Chem.* **22**, 1168-9(1950). A rapid method for the determination of oil in petroleum waxes is described.

SAPONIFICATION DETERMINATION IN WAXES. W. Zöllner. *Perfum. essent. Oil Rec.* **40**, 433, 447(1949). The Hezel method is described. The wax is saponified by heating in a flask at 130° for two hours with 0.5 normal KOH in ethylene glycol. The excess of KOH is then neutralized to thymolphthalein with 0.5 normal HCl, bromophenol-blue is added, and titration is continued. The second titration corresponds to the saponified fatty acids and allows the saponification value to be calculated. (*Brit. Abs.* B II, **1949**, 489)

IODINE NUMBER AND THIOCYANOGEN NUMBER OF LANOLIN. W. Gänssle (Woll-Wäscherei u. Kämmerei, Dohren bei Hannover, Germany). *Fette u. Seifen* **52**, 164(1950). When the Hanus method is used on lanolin, the iodine number increases with the excess of iodine available. These differences in iodine number are not due to solvents used so the iodine number cannot be used for the identification of lanolin. The thiocyanogen number was found to be reasonably constant irrespective of the excess of $(CNS)_2$ used. (*Chem. Abs.* **44**, 7567)

PATENTS

SYNTHETIC WAXES. H. G. Smith and T. L. Cantrell (Gulf Oil Corp.). *U. S. 2,506,903.* Synthetic waxes are prepared by the esterification of the OH groups of a soluble fusible alkyl phenol-HCHO resin with higher fatty acids. The alkyl group of the phenol should contain 4-12 C atoms. The products resemble beeswax and are useful in the preparation of greases, polishing compositions, and mineral oils. (*Chem. Abs.* **44**, 7574)

Extracting wax from cachaza. O. J. Swenson (Cuban-American Sugar Co. and S. C. Johnson & Son Inc.). *U. S. 2,508,002.* An apparatus and procedure are described for extracting wax from cachaza (sugar-mill filter-press cake) by continuous counter-current liquid-liquid extraction, the fluid flowing down while a H_2O insoluble (wax-soluble) solvent flows up. Preferred solvents are heptane, and other aliphatic and aromatic hydrocarbons, alkyl halides, and esters. (*Chem. Abs.* **44**, 7574)

Wax composition for coating fruit. O. P. Greenstreet. *U. S. 2,510,816.* A coating to be applied to fruit by brushes contains 100 lb. paraffin, 1-2% vegetable hard wax (such as carnauba), and 50-100 fluid ounces sulfonated mineral oil. (*Chem. Abs.* **44**, 7464)

• Drying Oils

Stuart Harrison, Abstractor

The drying of mahaleb oil and mahaleb stand oil. Saffet Riza Alpar (Univ. Istanbul, Turkey). *Rev. Faculte Sci. Univ. Istanbul* **14A**, 111(1949). Mahaleb oil from *Prunus Mahaleb* had average analytical values of: acid value 2.5; sap. value 189; and iodine number 153. The component acids were eleostearic 36%, linoleic 41%, and oleic 33%. A stand oil prepared by heating the oil to 300° for 2.5 hours had an iodine number of 108. The unbodied oil air dried in eight days while the stand oil air dried in 35 days. (*Chem. Abs.* **44**, 6656)

About the drying of oils that contain fatty acids with four conjugated double bonds. H. P. Kaufmann. *Fette u. Seifen* **52**, 140(1950). The oil extracted from the seeds of a tree, *Parinarium laurinum*, contains a large percentage of a 9,11,13,15-octadecatetraenoic acid (parinaric acid). The properties of the acid as well as the oil are described. There are two forms of parinaric acid, the α and the β forms. The α form is extremely oxygen sensitive while the β form is less sensitive. The α form will take up nearly four atoms of oxygen per mole of acid in less than 24 hours at room temperature. Films of the oils with drier will dry in less than one-fourth the time required for tung oil.

Drying oil from semidrying oil. M. Masuno, T. Asahara, and Y. Hiroya. *J. Nippon Oil Technol. Soc.* **3**, No. 1/2, 113 (1950). By isomerization of soybean oil with Ni-kieselguhr or Ni-activated carbon at 180-200° for 5-8 hours, diene and triene contents are increased from 9 to 22%. (*Chem. Abs.* **44**, 7563)

Oiticica oil and its use in the varnish field. W. Garmsen. *Fette u. Seifen* **52**, 112(1950). This is a review of the source, composition, properties, and use of oiticica oil.

Straight and modified phenolic resins. W. B. Maass. *Paint and Varnish Production* **30**, No. 6, 14(1950). This is a review article.

A review of developments in drying oils. R. L. Terrill. *Official Digest Federation Paint & Varnish Production* **No. 306**, 527(1950). Methods of upgrading and treating drying oils by conjugation of oils, solvent fractionation of oils, use of higher polyhydric fatty esters, reinforcement with maleic anhydride, styrenation, and treatment of oil with cyclopentadiene are reviewed.

Practical evaluation of drying. R. Arzens and W. J. Nijveld. *Chim. Peintures* **13**, 172; *Verfkroniek* **23**, 106(1950). A simple method involving observation of the set, dust free, tack free, solid, and hard states is proposed. (*Chem. Abs.* **44**, 6656)

Commercial production of tung oil in Nyasaland. Technical aspects. V. R. Greenstreet. *Oil. Colour Trades J.* **116**, 1765(1949). The effect of factory operating humidity on oil yield from nuts is shown, based on plant figures. The oil yield (basis nuts) ranged from 29.7 to 33% and was highest when atmospheric relative humidity was 69 or less. The effect of particle size of meal on oil yield is also given. (*Chem. Abs.* **44**, 6655)

Preparation of tall oil esters. E. R. Mueller, P. L. Eness, and E. E. McSweeney. *Ind. Eng. Chem.* **42**, 1532(1950). The effect of catalysts, temperature, carbon dioxide, flow rate, and amount of polyhydric alcohol on the esterification rate of tall oil was investigated. The polyhydric alcohols studied were glycerol, pentaerythritol, and sorbitol. Under the conditions studied catalysts had no appreciable effect on the esterification rate. The use of a 10% excess of alcohol gave the best rates. The optimum esterification temperature in the range studied was determined for each alcohol. The variables studied appeared to have little effect on the drying rate of the films.

Inositol-linseed fatty acid drying oils. J. P. Gibbons and K. M. Gordon. *Ind. Eng. Chem.* **42**, 1591(1950). Drying oils prepared by the esterification of inositol (hexahydroxycyclohexane) with linseed fatty acids have bodying characteristics similar to tung oil. The esterification rate is roughly the same as that of glycerol. Varnishes prepared by cooking with phenolic resins had excellent water and alkali resistance.

Sulfurization of linseed oil. R. Jacquemain, J. Berger, and G. Betant. *Bull. Soc. Chim. France* **1950**, 32. The rate of S absorption by linseed oil at 130-135° was determined. The reaction of sulfur with a purified sample of linseed oil gave off no H_2S, indicating that addition had taken place. After the addition of 4 atoms of S per mole of triglyceride, the mixture becomes very viscous. Reaction mechanisms are given. (*Chem. Abs.* **44**, 7072)

Studies on softening and oil resistance of insulating cloth. II. Properties of dried film of mixed varnish from tung and linseed oils. K. Suzuki. *Waseda Applied Chem. Soc. Bull.* **19**, 74(1942). The greater the linseed oil content above 25% in mixed varnish, the lower the quality of film formed. The film resisted oil less than either tung or linseed oil varnish because the mixed varnish turned into a film and dried too rapidly.

III. *Ibid.* 78. Mixing 10% of oil soluble phenolic resin with oxidized or polymerized oil prevented softening and made film more resistant to oil. Similar mixing of rosin, fused dammar, and fused copal showed no clear effect. (*Chem. Abs.* **44**, 7069)

Testing techniques and uses of equipment for evaluating organic coatings. R. J. Phair. *Paint and Varnish Production* **30**, No. 6, 8 and No. 7, 12 (1950). The importance of controlled conditions of temperature and humidity in preparing samples for testing is stressed. The methods of measuring and controlling film thickness are discussed. The equipment for measuring distensibility, adhesion, mar resistance, impact resistance, abrasion resistance, hardness, tack resistance, and print resistance are described and illustrated. A discussion of the value of the tests in predicting the performance of a finish is given.

Resin index of 1950. Frances Scofield. *National Paint Varnish Lacquer Assoc., Sic. Sect., Circ.* **No. 738**, 150 pp.(1950). (*Chem. Abs.* **44**, 6656)

Paint proving in south Florida. O. J. Sieplein. *Official Digest Federation Paint & Varnish Clubs* **No. 303**, 309(1950). Discusses the comparative rates of weathering in south Florida with those in other regions of the country. One year of weathering in south Florida frequently causes more deterioration than three years in the Chicago area.

New seal primer for aircraft finishing. Gilbert C. Close. *Products Finishing* **14**, 44(1950). A mixture of standard AN-D-656 $ZnCrO_4$ primer with a clear medium oil synthetic alkyd resin is superior to the standard primer in protecting aluminum against corrosion by salt spray, weathering, moisture penetration, and aviation fuel. (*Chem. Abs.* **44**, 7071)

PATENTS

Synthetic drying compositions. S. O. Greenlee and J. D. Zech. *U. S. 2,502,518.* A polyester is made by heating the diacetate of a dihydroxyphenol such as bisphenol with a dimeric acid made by thermally polymerizing a linoleic acid rich mixture of fatty acids. Acetic acid is spit out at temperatures of 180-275° to form the polyester. Films of the polyester containing cobalt drier will air-dry.

Polymerizable styrene-tall oil modified polyester composition. S. E. Glick. *U. S. 2,514,389.* A polyester is made from a glycol, an unsaturated dicarboxylic acid such as maleic and tall oil. The polyester (30-70) is mixed with styrene (70-30) and used to impregnate porous castings. The castings are then heated to 130° to polymerize the mixture thus rendering them impervious.

Interpolymerization of styrene, alpha-methyl styrene, and oxidized soybean oil. H. M. Hoogsteen. *U. S. 2,521,675.* An air-blown soybean oil containing about 17% of combined oxygen is polymerized with a styrene and α-methyl styrene mixture by heating to 100-300° in the presence of a drier.

Protective coating compositions. W. J. Sweeney. *U. S. 2,522,469.* The metal wetting ability of protective coatings is improved by adding 0.1 to 10% of an alkylolamine such as diethylaminoethanol. This is claimed to improve the water resistance of the film and also permit the painting of moist objects.