Summary

The gossypol-like pigments, gossypurpurin and diaminogossypol, have been shown to react with aniline to give the same reaction product as does gossypol. These pigments also react with *p*-anisidine to give products whose absorption spectra exhibit maxima in the same positions as that of the reaction product of gossypol and *p*-anisidine.

Acknowledgment

The authors wish to express their appreciation to Lawrence E. Brown of the Analytical and Physical Division for the microdeterminations of carbon, hydrogen, and nitrogen reported in Table II.

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ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Color in margarine. I. Evaluation of color using the Lovibond tintometer. Audrey M. K. Brabant-Smith (Ontario Res. Found., Toronto). *Can. J. Tech.* 29, 296(1951). Readings of duplicate samples of each of 4 margarines was made by a panel of 12 members, using a B.D.H. pattern Lovibond tintometer. Statistical analysis of the results indicated that the accuracy of the method was ± 0.5 units.

II. An indirect method for measurement of color in terms of the Lovibond color system. *Ibid.* 303. A three-filter photoelectric reflectometer has been adapted to measure the color of margarine. From the results chromaticity co-ordinates can be calculated and these co-ordinates converted to Lovibond units.

Solvent extraction research. W. D. Harris (Texas A. and M. College. College Station). *Oil Mill Gazetteer* 56(1), 49(1951). The extraction of cottonseed with isopropyl alcohol is discussed. A new type solvent extractor is also mentioned.

Solvent extraction of cottonseed. J. W. Dunning (V. D. Anderson Co.). *Oil Mill Gazetteer* 56(1), 64(1951). The Exsolex process as applied to cottonseed is discussed with particular reference to the quality of the oil and the meal produced.

Mixed hydrocarbon solvents for fatty acids and their triglycerides. R. Bogash and A. N. Hixon (Univ. Penna., Philadelphia). *Chem. Eng. Prog.* 47, 347(1951). The solubility relationships of fatty acids and their triglycerides in mixtures of methane and propane have been investigated and it is shown that the addition of methane effectively lowers the critical solution temperature for a given solute. Evidence of the importance of solvent density is presented. It is shown that the use of methane mixtures increases the versatility of propane as a selective solvent.

2-thiobarbituric acid as a reagent for detecting milk fat oxidation. S. Patton and G. W. Kurtz (Penna. Agr. Exp. Station, College Station). *J. Dairy Sci.* 34, 669(1951). A preliminary study concerning the use of 2-thiobarbituric acid to measure oxidative deterioration in pure milk fat has indicated that this reagent is more sensitive than the Kreis test. Malonic dialdehyde has been shown to yield a red color when heated with this reagent. Spectral analysis of this color has revealed it to be identical with that obtained similarly from oxidized milk fat and to resemble closely colors secured on oxidation of unsaturated fatty acids.

Recent technological advances in cottonseed processing. E. A. Gastrock (Southern Reg. Res. Lab., New Orleans, La.). *Oil Mill Gazetteer* 56(1), 35(1951). Hydraulic pressing, screw pressing, and solvent extraction are discussed as well as the quality of the variously prepared meals.

The petroleum and solvent extraction industries under the impact of war. H. E. MacGee (Skelly Oil Co.). *Oil Mill Gazetteer* 56(1), 44(1951). Although the volume of solvents required for oil extraction is small compared with the total output of the petroleum refiners, every effort should be made to conserve extraction naphthas as there is a tendency for oil companies to lose interest in small volume business during war time.

Detection of artificial coloring of fats. H. Thaler (Deut. Forschungsanst. Lebensm., Munich, Ger.). *Fette u. Seifen* 53, 132-3(1951). A review covering mainly chromatographic methods. (*Chem. Abs.* 45, 6857)

Microdetermination of glycerol. R. B. Bradbury (Melbourne, Australia). *Mikrochemie ver. Mikrochim. Acta* 38, 114-19(1951). The test depends on hydrolyzing a fat with 50% aqueous KOH and converting the freed glycerol to isopropyl iodide with HI in the presence of propionic acid. The reaction $C_3H_{10}O_3 + 3\ HI = (CH_3)_2CHI + 3\ H_2O + I_2$ takes place, and the liberated I is collected in a solution containing Br, acetic acid, and sodium acetate which oxidizes the I to IO_3^-. At the end, the excess Br is removed by adding HCO_2H, $H_2SO_4 + KI$ and the liberated I is titrated with 0.02 *N* $Na_2S_2O_3$. (*Chem. Abs.* 45, 6857)

Aging of oleins (red oils). Th. Francois and M. Juillard (Lab. Chevreul, Paris). *Bull. mens. ITERG* 5, 238-43(1951). After unsuccessful attempts to remove part of the linoleic acid present in commercial red oils by selective polymerization or selective solvents, the following method was adopted: Neutralization of equal parts of red oil and ethyl ether with NH_3 under reflux, addition of more ethyl ether to the mixture to twice its volume, and filtration at 15-18°. Under these conditions only the NH_4 oleate is easily soluble. The liquid phase is treated with HCl and the liberated oleic acid examined by the Mackey test. By variation of the quantities of solvent employed, up to 80% of fatty acids could be obtained from the liquid phase. All red oils thus purified gave distinctly better Mackey tests than the original red oils. Methyl esters of six red oils prepared by the usual method with H_2SO_4 as catalyst, were perfectly stable against oxidation. (*Chem. Abs.* 45, 6857)

Utilization of elder-tree oils. H. Heller (Hamburg, Ger.). *Seifen-Ole-Fette-Wachse* 77, 161-2(1951). A brief review on the utilization of the oils from the fruit pulp and the seed of *Sambucus racemosa.* (*Chem. Abs.* 45, 6857)

Re-evaluation of grapeseed oil and of extracted grapeseed. M. C. Goday and F. S. Catala. *Ion* 11, 17-21(1951). Grapeseed oils of high acidity were neutralized by esterification. The acid number was brought from 60 to 2-3 in 2 hours. The resulting ester mixture was used for further processing, e.g. hydrogenation to solid fat, reduction to fatty alcohol with Na, transesterification, extraction, or distillation, refining, or alcoholysis. (*Chem. Abs.* 45, 6857)

Phospholipids in foods. II. Changes in phospholipid content of foods, particularly of milk. H. P. Kaufmann, J. Baltes and B. Sibbel (Chem. Landesuntersuchungsamt, Nordrhein-Westfalen, Ger.). *Fette u. Seifen* 52, 736-7(1950). The phospholipid content of whole milk was not affected by heating to 100° or by ultra-violet irradiation. Acidification of whole milk before heating resulted in a decrease in phospholipid content of 19.8%. Condensed milk on heating at 100° showed a 23.8% decrease in phospholipid content. (*Chem. Abs.* 45, 6763)

Physiological role of polyunsaturated fat acids. Phosphoaminolipid content of brains of rats fed a lipid-free diet. M. Beauvallet (Sorbonne, Paris). *Compt. rend. soc. biol.* **144**, 1596-9 (1950). Feeding a diet free of lipids (but supplemented with fat-soluble and water-soluble vitamins) to adult rats for 3 months had no effect on the weight of the brain or on its total lipid content and phosphatide/total lipid ratio. Young born of these rats, examined when 25 days old, were undersized but their brain phosphatide/total lipid ratio was normal.

Distribution of unsaturated fat acids in the brain phosphoaminolipids of the rat. M. Beauvallet and S. Manuel. *Ibid.* 1599-1602. The phospholipid fraction from brains of normal adult rats contained 13-15% of tetraene fat acids (chiefly arachidonic), almost no triene and diene acids, and 32-36% of acids with one double bond. In adult rats fed a lipid-free diet for 3 months the tetraenic acids decreased slightly and the fat acids with one double bond increased correspondingly. In young, growing rats from mothers fed the lipid-free diet a similar picture was observed except that the decrease in tetraenic acids was slightly greater (values were 75-85% of the normal). (*Chem. Abs.* **45**, 6708)

Refractive indexes of pure or mixed fat alcohols. C. Paquot. *Oleagineux* **5**, 644-5(1950). The values of n of dodecyl, cetyl, octadecyl and cis-9-octadecen-1-yl alcohols vary linearly as a function of the temperature; the temperature constant is the same for the 4 alcohols, and the n of mixtures of any 2 of them varies linearly with the weight composition of the mixture. (*Chem. Abs.* **45**, 6567)

Comparison of the fat production of nine strains of fusarium. A. Kleinzeller and J. Skoda (Tech. Univ., Prague). *Chem. Listy* **44**, 184-5(1950). The fat coefficients of 9 strains of *Fusarium* were 5.0-11.5 for the pure fats. The fat was obtained by ethyl ester extraction and purified by petroleum ether extraction. The fats had n_D^{40} 1.4610-1.4665. The best results were obtained with *Fusarium latericium.* (*Chem. Abs.* **45**, 6688)

Modern approach to soybean processing. C. Vogt and K. McCubbin (Blaw-Knox Co.). *Can. Chem. Proc.* **35**, 468(1951). A description of a solvent extraction plant is given in which a Rotocel extractor is used.

C_{20-22} unsaturated acids in butterfat. F. B. Shorland and D. L. Johannesson (Dept. Sci. Ind. Res., Wellington, New Zealand). *Nature* **168**, 75(1951). The presence of monoene, diene, triene, tetraene, and pentaene C_{20-22} acids was established. Alkali isomerization techniques were used to obtain rough estimates of the quantities present.

Pre-pilot plant investigation of a solvent extraction method for cottonseed based on reduced pressure filtration. J. J. Spadaro, A. V. Graci, H. K. Gardner, J. S. Parker, E. J. Laborde and E. A. Gastrock (Southern Reg. Res. Lab., New Orleans, La.). *Oil Mill Gazetteer* **56**(1), 77(1951). This process consists of mixing rerolled, cooked cottonseed flakes and hexane-oil miscella, followed by filtration and countercurrent washing in the press. Preliminary data indicate that this method may be of particular interest for small plants.

Canadian erucic acid oils. VII. Preparation of sulfated and hydroxy acids from rapeseed oil acids. N. H. Grace and A. Zuckerman (Nat. Res. Labs., Ottawa). *Can. J. Tech.* **29**, 276 (1951). Crystallization of rapeseed oil acids from 10 volumes of acetone at —40°C. yielded a precipitated fraction designated as practical erucic and an approximately equal fraction of soluble acids. Equivalent weights and iodine values for the solid acids were 326 and 73; 302 and 130 for the soluble acids. Distillation of the ethyl esters yields 74% C_{22} monounsaturated; 4.3% C_{16} chiefly saturated, 9.7% C_{18} and C_{20} monounsaturated and 12% residue. Sulfation of the erucic acid fraction gave a product comparable to sulfated oleic acid; the more unsaturated fraction yielded a more mobile oil. Hydrolysis of the former yielded hydroxybehenic acid.

The mechanism of autoxidation of monoethenoid fatty acids and their derivatives. J. H. Skellon and A. Gordon (Acton Tech. Coll., London). *Chem. Ind.* **1951**, 629. A review.

Hydrogenation yields fatty alcohols. R. F. Warren. *Chem. Eng.* **58**(6), 117(1951). A description is given of the Procter & Gamble Co. experimental plant at Long Beach, Calif., in which fats and fatty acids are converted to fatty alcohols at a rate of about 5 tons per day. The DeNora high pressure hydrogenation process is used with a cupric-chromite type catalyst.

Directed interesterification in glycerides. III. The synthesis of single-fatty acid 1, 3-diglycerides. F. J. Baur and W. Lange (Procter & Gamble Co.). *J. Am. Chem. Soc.* **73**, 3926(1951). The process involves the use of low-temperature directed interesterification in which symetrical diglycerides are preferentially crystallized from statistically distributed catalyzed single-fatty acid triglyceride-triacetin-glycerol mixtures. The method is useful in the preparation of symetrical diglycerides derived from single fatty acids with melting points above 20°. The purity of the compounds so prepared after recrystallization is, in general, better than that of previously described preparations.

Evaluation of the thiobarbituric acid test as a measure of the oxidized flavor in milk. W. L. Dunkley (Univ. Calif., Davis). *Food Tech.* **5**, 342(1951). On treatment with 2-thiobarbituric acid oxidized milk develops a red color and intensity of this color was found to correlate closely with the organoleptic flavor scores.

Preparation of lipid extracts from brain tissue. J. Folch, A. M. Lees, J. A. Meath and F. N. Le Baron (Harvard Med. School, Boston, Mass.). *J. Biol. Chem.* **191**, 833(1951). The tissue is homogenized with a 2:1 chloroform-methanol solution, filtered and the extract water washed. The water removes from the crude extract all non-lipid contaminants.

Examination of the distillate obtained by deodorization of palm kernel oil. R. Calas and N. Duffault (Faculte sci., Bordeaux, France). *Bull. mens. ITERG* **5**, 147-51(1951). Methylnonylketone and methylnonylcarbinol were isolated in about 10 and 5% d.b. yield from palm kernel oil deodorizer distillate. (*Chem. Abs.* **45**, 6402)

Aging of oleins (red oils). II. M. Th. Francios and M. Juillard (Lab. Chevreul, Paris). *Bull. mens. ITERG* **5**, 173-85 (1951). A commercial red oil and the unsaturated fatty acids from sunflower oil were mixed in various proportions and these mixtures heated in air at 80-85° for 50 hours. It was found that the iodine numbers of the heated oils were inversely proportional to the iodine numbers of the original mixture.

III. *Ibid.* 186-90. The three most effective antioxidants in commercial red oil were (in order of decreasing effectiveness): tertiary-butyl-m-cresol, butylhydroxyanisole, and β-naphthol.

Effect of heat on vegetable oils. M. M. Bhasin and J. S. Aggarwal (Natl. Chem. Lab., Poona). *J. Sci. Ind. Research* (India) **9B**, 298-300(1950). The changes in physical properties which occur on heating oils for 4 hours at 125°, 200°, and 300° are summarized. The oils studied were coconut, castor, peanut, mustard, safflower, and linseed. (*Chem. Abs.* **45**, 6401)

Determination of metallic oxide content in metallic stearates. P. N. Cheremisinoff. *Paint, Oil & Chem. Rev.* **114**, No. 4, 14, 16(1951). Gravimetric and volumetric methods for analysis of Ca, Mg, and Zn stearates are described and compared. (*Chem. Abs.* **45**, 6400)

Colored derivatives of fatty acids. Colored esters prepared from C_1 to C_{18} normal saturated acids and 4-phenylazophenacyl bromide and their separation by chromatographic adsorption. S. Masuyama (Kyushu Univ., Fukuoka). *J. Chem. Soc. Japan*, Pure Chem. Sect., **71**, 402-5(1950). The 4-phenylazophenacyl esters of fatty acids are colored. Chromatographic separation, by means of activated alumina as adsorbent and C_6H_6-petroleum ether (1:1) as solvent [the eluent was in most cases C_6H_6-butyl acetate (9:1)], of the following mixtures of pairs of the above esters was effected: formic, palmitic; formic, acetic; acetic, propionic; propionic, butyric; butyric, valeric; lauric, stearic; myristic, stearic. (*Chem. Abs.* **45**, 6400)

Highly unsaturated hydrocarbon in fatty matter of finback whale liver. T. Tsuchiya and A. Kato (Govt. Chem. Ind. Research Inst., Tokyo). *J. Chem. Soc. Japan*, Pure Chem. Sect., **71**, 514-15(1950). From the unsaponifiable fraction of the oil from the liver of a finback whale an unsaturated hydrocarbon ($C_{48}H_{78}$) was isolated in small yield. (*Chem. Abs.* **45**, 6399)

The physicochemical nature of rendering livestock fat. E. Mirkin and A. Manerberger. *Myasnaya Ind. S.S.S.R.* **22**, No. 2, 9-13(1951). The character of fatty tissue and bones and effect of heat on this are discussed. Best yields and lowest fatty acid content of product were obtained from the raw material soaked in ice water for 6 hours. Rendering bones in an open tank yielded 30-45% of the fat, while in an autoclave 60-80% of the fat could be extracted. The curve on development of free fatty acid during rendering of bones showed the following rendering temperatures to free fatty acid: 65°, 0.45; 85°, 0.5; 100°, 0.7; and 120° over 1.0%. (*Chem. Abs.* **45**, 6399)

Antioxidants for butter in confectionery. M. G. Mayberry (Mellon Inst.). *Confectioners J.*, November, **1949**. An oven test at 60° was used to determine the effectiveness of 8 different additive mixtures upon the stability of butterfat. Propyl gallate was the most effective of the additives tested. The addition of 0.007% of propyl gallate or 0.0058% of propyl gallate with 0.0056% of ascorbyl palmitate increased the stability of butter by a factor of approximately 3. (*Chem. Abs.* **45**, 6314)

Determination of fat content of dairy products. S. Anselmi and Adriana Ceasri (Ist. super sanita, Rome). *Rend. ist. super sanita* (Rome) 13, 689-701(1950). Mix 5-10 g. of cheese or other dairy products in a mortar with 15-30 g. of Na_2SO_4. Let stand 1 hour. Transfer to an extraction thimble and extract in a Soxhlet apparatus with ether for 4 hours. Evaporate and dry at 100-105° for 2 hours before weighing. Fats are obtained unchanged and can be used for further study. (*Chem. Abs.* 45, 6313)

Fat determination in milk. A. Fabris (Univ. Sassari, Italy). *Mondo latte* 1951, 140, 143-4, 147, 149, 151, 153-4, 157, 159-60. The author thinks that differences found by analysts between the results of the standard Gerber method and other modified methods are due to the fact that the former method is not carried out properly. (*Chem. Abs.* 45, 6313)

The higher alkyl gallates as antioxidants. K. J. H. van Sluis. *Food Manuf.* 26, 99-101(1951). Octyl and dodecyl gallates are readily soluble in oils and fats. Tests on rats showed that high single doses of octyl, decyl, and (or) dodecyl gallates are not toxic. These higher gallates have an LD_{50} of approximately 4 g./kg.. In continuous-feeding tests when a diet containing 0.2% dodecyl gallate in the fat fraction was given, no decrease in growth could be noticed, even after 3 successive generations of rats. Some of the higher alkyl gallates possess fungicidal properties. (*Chem. Abs.* 45, 6289)

Apparatus for continuous distillation of miscella. J. Mayolle. *Bull. mens. ITERG* (Inst. tech. etudes et recherches corps gras) 5, 191-2(1951). Apparatus of A. Beckel, *et al.*, is modified by reducing the size of the gasification chamber and placing it directly on top of the distillation flask in order to avoid premature condensation of solvent vapors. (*Chem. Abs.* 45, 5977)

The woolens greasing problem. A. Parisot. *Oleagineux* 6, 491-493(1951). Woolens need to be greased to aid their mechanical processing and improve the behavior of the fibre. The various properties which are required for a satisfactory product are discussed.

Extraction of fats by selective solvents. C. Paquot. *Oleagineux* 6, 459-472(1951). The method, theory, and flow diagram for the fractionation of oils using furfural or propane are discussed in detail. The use of other solvents such as methanol and acetone as fractionation mediums is discussed.

Note on continuous fractionation columns and their application to fatty acid work. A. Fichoux. *Oleagineux* 6, 483-487(1951). Continuous fractionation of fatty acids offers advantages of fuel saving and regular composition of product. Discusses operation under partial vacuum with steam injection and suggests the possible use of a column with growing diameter from bottom to top.

Twenty years of esterification in oil refining in Italy. A. Paleni. *Oleagineux* 5, 149-164(1951). Discusses the theory and practice of esterification of vegetable oils, dehydration with azeotropes, effect of temperature and catalysts, particularly ones such as alkane sulfonic acids (Indoil), and the effect of improved contact between the reagents.

The treatment of oil expressed from olive pulp with solvents. E. Santelli. *Oleagineux* 5, 165-167(1951). Solvent extraction methods for obtaining edible olive oil are outlined. Yields and operating costs of such plants are given.

Extraction of certain oil-bearing materials with trichloroethylene. R. F. Russell (Iowa State Coll., Ames). *Iowa State Coll. J. Sci.* 25, 348-9(1951). The successful use of $CHCl:CCl_2$ in the extraction of oil from soybean flakes suggested its use in the extraction of other oils and waxes such as wheat germ oil, milkweed seed oil, sorghum oil, safflower seed oil, and cottonseed oil. Waste waxed papers were successfully dewaxed but the extraction of wax from sorghum bran failed because fines prevented proper flow of the solvent. (*Chem. Abs.* 45, 6858)

PATENTS

Separation of sterols from mixtures. J. T. Hackmann (Shell Div. Co.). *U. S. 2,559,153.* A process is disclosed for separating cholesterol from natural mixtures which comprises converting the cholesterol into a crystalline molecular urea complex and separating the complex from the other components of the mixture.

Baker's grease. R. S. Truesdall. *U. S. 2,559,481.* A method of producing baker's grease is disclosed in which a potable oil is heated to at least 150°F. and first lecithin, then melted beeswax are added, and the mixture homogenized.

Production of ether esters. M. K. Smith (Baker Castor Oil Co.). *U. S. 2,562,218.* From 7-13 parts of alkylene and polyalkylene glycol monoalkyl or aryl ethers are reacted with one part of castor oil under anhydrous conditions at 20° to 35° in the presence of 0.01 to 1.0% alkali metal hydroxide to form a castor oil ether.

Nut butter manufacture. P. J. Mitchell, Jr. *U. S. 2,562,630.* A process is disclosed which comprises dispersing in nut butter a melted hydrogenated fat (2-5% based on weight of nut butter), rapidly cooling to obtain crystallization of the hydrogenated fat predominantly in α and β' forms, agitating the dispersion and storing below the β crystallization temperature.

Acylating castor oil. C. H. Fisher and M. L. Fein (U.S.D.A.). *U. S. 2,562,900.* A continuous method of producing acetylated castor oil is disclosed in which a mixture of oil, acetic anhydride, and sulfuric acid is passed into a heated reaction zone maintained above the boiling point of acetic anhydride. Acetic acid and excess acetic anhydride are removed overhead.

Miscella refining. R. G. Folzenlogen (The Buckeye Cotton Oil Company). *U. S. 2,563,327.* Vegetable oils in solution in volatile solvents are refined by agitating the miscella with aqueous NaOH in the presence of a non-ionic compound which is liquid at 80°F. This compound may be either ethers of a polyhydric alcohol having 2-3 hydroxy groups and containing 2-8 carbon atoms, or a non-ionic organic derivative of such ethers containing an unreacted hydroxyl group.

Cottonseed oil refining process. R. G. Folzenlogen (The Procter and Gamble Company). *U. S. 2,563,328.* The refining yield from crude cottonseed oil is improved if, before the addition of sodium hydroxide, a non-ionic compound is added to the crude oil. This compound may be either a non-cyclic ether of a polyhydroxy alcohol containing up to 3 hydroxy groups and 2-8 carbon atoms, or the non-ionic organic derivative of these ethers in which at least one unreacted hydroxyl group has been substituted.

Food antioxidants. M. F. Gribbons and H. R. Dittmar (E. I. duPont deNemours & Co.). *U. S. 2,563,835.* A multiple component antioxidant suitable for inhibiting materials susceptible to rancidification is described which consists of a β-mercaptopropionic acid in which the sulfur atom is combined with a hydrocarbon, oxygenated hydrocarbon, sulfur hydrocarbon, sulfur and oxygenated hydrocarbon, or sulfur-nitrogen hydrocarbon, citric acid, and an alkylated hydroxyanisole, present on a weight basis within these proportions 1:1:1 to 10:1:1 to 10:10:1.

Food antioxidants. M. F. Gribbons and H. R. Dittmar (E. I. duPont deNemours & Co.). *U. S. 2,564,106.* An antioxidant composition is claimed which comprises an antioxidant from the group alkylated hydroxyanisole, tartaric acid, citric acid, glycerol, lecithin, and ethyl tyrosine, and from 10-75% of a beta-substituted-mercaptopropionic acid as described above.

Purified oils and processes of preparing same. F. P. Parkin and G. N. Walker (Minnesota Paints, Inc.). *U. S. 2,564,407.* A process for simultaneously removing the hydrophilic and waxy components from natural vegetable oils comprises continuously chilling the oil to 20-50°F., adding to the chilled oil an aqueous refining agent, mixing the two and centrifuging the oil at a temperature of less than 60°F. to remove foots and wax. The entire process must be carried out in a few minutes.

Extraction of oleiferous materials. L. C. Rubin (M. W. Kellogg Co.). *U. S. 2,564,409.* A finely divided oleiferous solid is treated with a solvent at superatmospheric pressure and a fraction of the extract oil is separated from the resulting miscella and used to slurry the entering solids.

Fractionation of tall oil. L. H. Dunlap and C. F. Sievert (Armstrong Cork Co.). *U. S. 2,565,484.* Tall oil is fractionated to obtain a fraction substantially completely free from saturated fatty acids by oxidizing tall oil until a product having a viscosity of between about 15 to 250 seconds at 25° is obtained, removing saturated fatty acids from the resulting material by means of a non-polar solvent, and recovering an oxidized saturated-fatty-acid-free tall oil fraction as residue.

Separation of stearin. G. Neudert and T. A. Lange. *British 650,720.* A flow sheet is presented for a process for separating stearin from olein and unsaponifiable material by warming to 50°, dissolving in a liquid hydrocarbon, cooling to 0-10°, so that stearin separates and may be filtered. (*Chem. Abs.* 45, 6406)

• Biology and Nutrition

R. A. Reiners, Abstractor

Soybean lecithin for feeding. J. Eichberg (American Lecithin Co.). *Soybean Digest* **11**(9), 18(1951). A review on effects of lecithin in animal feeding.

The digestibility of stearyl alcohol, isopropyl citrates, and stearyl citrates and the effect of these materials on the rate and degree of absorption of margarine fat. C. E. Calbert, S. M. Greenberg, G. Kryder and H. J. Deuel, Jr. (Univ. So. Calif., Los Angeles). *Food Res.* **16**, 294(1951). None of these additives were found to interfere with the digestibility of margarine in the rat or dog even when fed at a level 25 times the maximum proposed.

Turnover rate of fatty acids of the liver. G. Hevesy, R. Ruyssen and M. L. Beeckmans. *Experientia* **7**, 144-6(1951). Assuming the half life of fatty acids in the liver to be 1 day and allowing 30 minutes after feeding carboxyl-C^{14} labeled sodium acetate for the formation of active fatty acids, the decrease in specific activity of fatty acids between 30 and 60 minutes should be less than 3%. The actual decrease of 50% observed in the liver of mice suggests the presence of a rapidly renewable fatty acid fraction in the liver. There is no evidence for such a phenomenon in brain fatty acids and muscle fatty acids. (*Chem. Abs.* **45**, 6715)

Xanthophylls as a factor in the biological availability of vegetable carotenes. Elizabeth C. Callison, Lois F. Hallman, W. F. Martin and Elsa Orent-Keiles (Agr. Res. Admn., U.S.D.A., Washington, D. C.). *Arch. Biochem. Biophys.* **32**, 407(1951). Lutein, the chief xanthophyll in green leafy vegetables, was found to have no effect upon the utilization of carotene for growth of rats.

The level and interrelationship of plasma lipids of the laying hen. H. A. Walker, M. W. Taylor and W. C. Russell (Rutgers Univ., New Brunswick, N. J.). *Poultry Sci.* **30**, 525(1951). Total plasma lipid values of laying hens on normal rations averaged 1476 mg./100 ml. Of this 30% was phospholipid, 62% neutral fat, and 7% cholesterol (80% free). Blood plasma may contain as much as 13% lipids. A low fat diet caused a slight drop in total plasma lipids, a high fat diet caused no changes whatsoever.

Stability of aqueous and oily vitamin A acetate and carotene solutions. J. G. Bieri (Univ. Texas, Galveston). *J. Nutrition* **44**, 327(1951). Vitamin A acetate or β-carotene in dilute aqueous Tween 40 or cottonseed oil solutions with α-tocopherol or NDGA as antioxidants are essentially quantitatively retained for at least 50 days of storage under N_2 at 7° in the dark. Tocopherol affords slightly better protection to aqueous preparations than does NDGA.

Utilization of castor-seed cake. N. R. Kamath and R. K. Kulkarni (Univ. Dept. Chem. Technol., Bombay). *J. Sci. Ind. Research* (India) **9B**, 289-95(1950). The defatted castor-seed cake (1 part) is extracted with 0.2% NaOH solution (20 parts) at 60° for 30 minutes, and the proteins are precipitated by acetic acid or SO_2. Castor proteins can be used to produce excellent distempers, oil-bound water paints, products similar to casein plastics, adhesives for wood, and a potential raw material for textile fibers. (*Chem. Abs.* **45**, 6402)

Conversion of first and sixth carbons of stearic acid to carbon dioxide by rats. E. O. Weinman, J. L. Chaikoff, B. P. Stevens and W. G. Dauben (Univ. Calif., Berkeley). *J. Biol. Chem.* **191**, 523(1951). Stearic acids, labeled with C^{14} at either the carboxyl or the 6th carbon, were injected into fasted rats in the form of their triglycerides and the expired $C^{14}O_2$ measured. Body fats were examined for C^{14} 24 hours after injection. The data indicate that once the oxidation of stearic acid is initiated, the major portion of it is fragmented into small units.

The effect of fat content in feed on the development of the animal organism. I. The effect of feeding various amounts of crude fat on the growth and protein metabolism of albino rats. H. Tangl, V. Kurelec and L. Kallai (Research Inst. Animal Breeding, Budapest). *Agrartudomany* **2**, 365-74(1950). Three groups of albino rats weighing less than 50 g. were fed 60 days with feeds containing identical quantities of protein and starch. The fat contents of the feeds were 2% for group 1, 7.4% for group 2, and 18.0% for group 3. The average weight increase in the groups was 66.2, 109.6, and 121.4 g., respectively. A high fat content in the feed increased protein assimilation significantly. The fat content of the feed was increased for groups 2 and 3 by the addition of processed vegetable oil.

II. The control of protein assimilation in pigs by administering feeds with various fat contents. Pigs in successive periods received diets containing 2.7, 2.5, 4.6, and 20.0% crude fat. The presence of more fat definitely increased protein assimilation.

III. Suitability of sunflower seed cake and extracted sunflower seed meal for the feeding of young pigs. Young pigs weighing 12 kg. were fed barley meal as a basic diet. In various groups 15% of the barley meal was replaced by either sunflower seed cake from large oil mills, containing moisture 10.86, crude protein 31.36, and crude fat 8.63% (group 1), extracted sunflower seed flour, containing moisture 9.98, crude protein 49.05, and crude fat 1.63% (group 2), extracted sunflower seed meal containing moisture 9.68, crude protein 33.99, and crude fat 1.53% (group 3), or sunflower seed cake from small mills, containing moisture 9.20, crude protein 34.21, and crude fat 15.63% (group 4). The digestibility rates for groups 1, 2, 3, and 4, respectively, were for crude protein 80.99, 77.61, 76.79, and 80.43%. (*Chem. Abs.* **45**, 6253)

Absorption of fat and of cholesterol in the rat, guinea pig, and rabbit. R. P. Cook and R. O. Thomson (Univ. Coll., Dundee, Scot.). *Quart. J. Exptl. Physiol.* **36**, 61-74(1951). Sufficiently large amounts of fat and of cholesterol were added to diets to outweigh errors in absorption data due to synthesis or destruction in the gut. The apparent absorption by rats of cooking fat, butter, or olive oil at concentrations of 16.6% in chemically defined diets was 96, 97, and 97%, respectively. Cholesterol in a concentration of 1.7% was absorbed by rats from these diets at an average value of 0.3 g./kg. body weight/day and an average absorption of 30%. Apparent absorption occurred on a low-fat diet. On a basal diet of animal food cake and 16.6% olive oil rats absorbed 92% of olive oil, guinea pigs 77%, and rabbits 94%. On the food cake and olive oil diet containing 1.6% cholesterol the absorption of cholesterol, measured as unsaponifiable matter, was as g./kg. body weight/day for rats 0.35, for guinea pigs 0.25, and for rabbits 0.2; and the average absorption 34, 47, and 77%, respectively. After feeding cholesterol the plasma levels were very high in the rabbit, less in the guinea pig, and least in the rat. (*Chem. Abs.* **45**, 6251)

Practical application of physiological antioxidants. K. C. D. Hickman. *Conf. on Biol. Antioxidants, Trans.* **4**, 114-23(1949). It should be possible, with natural or artificial antioxidants, to control spontaneous oxidation at various stages of the *in transitu* journey of metabolites. An oxidative or reductive status of the gastro-intestinal tract must be recognized, rather than the mere presence or absence of antioxidants. Because of its sparing action on many organs, the physiological antioxidant has little specificity and no recognized deficiency syndrome. Clinical laboratory criteria for antioxidant status should be devised, and an appraisal made of health and disease in relation to physiological antioxidants. (*Chem. Abs.* **45**, 6251)

Changes in the tocopherol content of the body during fasting in the rat. A. Chevallier, R. Schneider and C. Burg (Univ. Strasbourg, France). *Compt. rend. soc. biol.* **144**, 1394-6(1950). In rats starved for 170 hours nearly all of the carcass fat dissappeared but the total tocopherol in the homogenized carcass remained unchanged.

Changes in fat acids with four double bonds during fasting in the rat. A. Chevallier, C. Burg and R. Wagner. *Ibid.* 1396-7. During 170 hours of fasting carcass fat descended to a very low level. The fat acids with 4 double bonds showed no decrease for the first 140 hours, then decreased to about one-half in the next 30 hours. (*Chem. Abs.* **45**, 6254)

Metabolism of lipids. M. Delaville. *Documentation biol. prat.* **4**, 247-73(1950). A historical review, including discussion of theories of normal lipid metabolism, of disorders due to abnormal lipid metabolism, and of the effect on lipid metabolism of various pathological conditions. (*Chem. Abs.* **45**, 6277)

Obtaining vitamin A from beta-carotene. M. T. Mellier and M. Servant. *Oleagineux* **6**, 473-478(1951). Beta-carotene isolated from palm oil can be converted to vitamin A aldehyde by oxidation with hydrogen peroxide in the presence of osmium tetroxide.

The use of industrial sterols from tall oil in the preparation of dehydroandrosterone. G. Jacini and F. Gastini. *Olearia* **5**, 145-148(1951). Sterols are separated from sulfate soap and the product is then oxidized to dehydroandrosterone.

• Drying Oils

Stuart A. Harrison, Abstractor

Some chemical changes associated with the thermal polymerization of drying oils. C. Barker, R. V. Crawford and T. P. Hilditch. *J. Oil and Colour Chemists' Assoc.* **34** No. 371, 215 (1951). Sunflower seed oils which are rich in linoleic acid and linseed oil which is rich in linolenic acid were heat bodied and component acids studied photometrically and by analysis. It was found that the iodine value of the heat bodied products was higher than it should be if the polymerization involved a Diels-Alder addition with the elimination of one double per acid molecule. Dimerization is apparently effected by a single cross-linking between two carbon atoms in different linoleic radicals, resulting in effect in the formation of a complex dicarboxylic acid grouping. In the early stages of the process this cross-linking takes place intramolecularly; i.e., between two linoleic groups in the same molecule. In the later stages there are indications that similar, but intermolecular, cross-linking occurs. The results with linseed oil appear to be strictly parallel to those for sunflower seed oil.

New developments in aluminum paint vehicle formulation. R. I. Wray. *Official Digest Federation Paint and Varnish Production Clubs.* No. 319, 492(1951). Reviews the effect of different vehicles on the properties of aluminum paints.

The swelling of linseed oil. K. Meier. *Farbe u. Lack* **57**, 186 (1951). Films of linseed oil varnish (age 14 days) on glass plates were placed in distilled water, removed every two days, dried, and weighed. In 2, 4, 6, and 18 days the weight of the film increased 16, 27, 36, and 62%. In .1, 0.4, and .7% sodium chloride solutions the rate of swelling fell off with increasing sodium chloride concentration. In 1% and 2% sodium chloride the film lost 3% and 7%, respectively, in 18 days by extraction of water soluble components. Hydrochloric acid solutions, ammonium chloride, calcium chloride, aluminum chloride, glucose, and sucrose all had similar effects. The swelling is reversible. Addition of 1% paraffin wax reduced the swelling of the film considerably. (*Chem. Abs.* **45**, 6396)

Tobaccoseed oil. J. H. Greaves. *Paint, Oil and Colour J.* 120 No. 2756, 320(1951). Tobaccoseed oil must be alkali refined before use in the paint and varnish industry. Though it is not a replacement for linseed oil its non-yellowing properties make it attractive for use in alkyds. It can also be copolymerized three to one with tung oil to give an oil suitable for general use.

Oils and synthetic resins as high-strength driers. R. Lipsky. *Bull. Soc. Chem. France* **1951**, 142. The acid chlorides of eleostearic and 4-cetoeleostearic acids dry very rapidly in the absence of ordinary driers. These synthetic oils are suggested as driers in the usual sense. Thus, the addition of 20-25% of eleostearoyl chloride to castor oil and heating for 1 hour at 190° produced an oil with 10% oleic acid which dried without drier in 20 hrs. (*Chem. Abs.* **45**, 6396)

Gloss of oil varnishes. C. Salvi. *Pitture e vernici* **4**, 395(1948). The gloss is influenced by the nature of the resin, oil, drier, thinner, and manner of preparation. For resins of the same class the gloss tends to vary inversely as the hardness of the resin. The more readily polymerizable oils usually give the best gloss; incorporation of oils such as grapeseed oil usually lowers the gloss. Rosin gives exceptionally glossy varnishes and where durability is not essential, a varnish containing rosin 55, linseed stand oil 5, and thinner 40 parts is outstanding. It is easier to obtain good gloss with rosin-modified phenolic and maleic resins than with pure phenolics. (*Chem. Abs.* **45**, 6398)

Wrinkle finishes. R. Goldenhill. *Org. Finishing* 12 No. 7, 8 (1951). Modern wrinkle finishes are based on the use of drying oils and alkyds while the early finishes were based on tung oil and linseed oil. The wrinkling is considered to result from the rapid oxidation of the surface causing an expansion of the top surface which in turn results in ruptures and wrinkles. The advantages, methods of evaluating films, methods of applying films and problems in applying the films are discussed.

The cultivation and production of tung oil. Part I. G. T. Bray, *Paint Manuf.* 21 No. 8, 287(1951). Tung oil comes largely from the nuts of two trees *Aleurites fordii* and *Aleurites montana*. Tung oil is now produced commercially in the United States, Union of South Africa, Australia, India, Argentina, Brazil, and Russia, as well as China. Some production figures are given.

PATENTS

Core binding material from drying oils. F. R. Moser. *U. S. 2,556,335.* A core binding material which dries faster and is not particularly sensitive to moisture is prepared by using a peroxide and drier with the oil. A typical recipe is: linseed oil (3 kg.) containing .1% cobalt and .3% lead as the napthenates, sodium perborate (90 g.) and dry quartz sand (100 kg.) are thoroughly mixed together. When 3% of this mixture and 97% quartz sand are mixed the shearing strength of the air dried core is considerably greater than that of a similar mixture that contains no sodium perborate. Other peroxides such as di-t-butyl peroxide and benzoyl peroxide may be used.

Copolymerization of styrene with blown unsaturated fatty oils. R. W. Nye. *U. S. 2,556,336.* An unsaturated oil such as linseed, soyabean, menhaden, etc. is blown until it has a viscosity of preferably 20-80 poises (Gardner method). The oil is then mixed with an equal weight of styrene or less and heated to 105-140° until the viscosity reaches at least 27 poises. The heating time varies generally from one to three hours. The monomeric styrene is removed to give a resin oil which dries to a flexible crease resistant coating having good electrical properties.

Polyvinyl ester-ester interchange process. E. W. Eckey. *U. S. 2,558,548.* An ester interchange between polyvinyl acetate and fatty acid esters of primary alcohols is brought about by alkaline catalyst in the presence of a promoter; e.g. the following materials were mixed in a flask: polyvinyl acetate AYAC (50 g.), linseed methyl esters (230 g.), methyl cellosolve acetate (17 g.), and methyl acetate (93 g.). The last two materials are called promoters and speed up the interchange. The mixture is warmed to 48° and then 6.3 c.c. of the catalyst, sodium hydride in suspension in heptane (0.34 g. per c.c.) was added. The reaction mixture was heated to 90° and the pressure gradually reduced to 15 mm. during the next 20 minutes and held there for another one-half hour. The vacuum was broken with nitrogen and the catalyst inactivated with acetic acid. The sodium compounds were converted to phosphates with phosphoric acid and filtered off. The volatile materials were removed by heating to 250° at 1 mm. The product contains not more than 1.5% combined acetic acid. The product dries much faster than linseed oil to a hard film with a high gloss. Other fatty esters both saturated and unsaturated may be used to give a variety of products.

Polymerizable esters. F. Armitage, J. Andrews and D. H. Hewitt. *U. S. 2,558,667.* Methyl maleate is heated with a mixture of methyl esters of fatty acids having non-conjugated polyunsaturation but no conjugated polyunsaturation to give an adduct, which is a substituted methyl succinate. For example, methyl maleate and linseed methyl esters give an adduct. The allyl ester of this adduct is then made by esterification with an excess of allyl alcohol using sodium as the interchange catalyst. The resulting polyallyl ester has drying properties which make it suitable for a coating material.

Ester-amides of amino-hydroxy compounds and derivatives thereof. W. A. Jordan and S. H. Shapiro. *U. S. 2,559,440.* An ester-amide is prepared by heating 1,000 lbs. of linseed fatty acids and 144 lbs. of trishydroxy methylaminomethane from 150 to 230° over four hours. To the ester-amide so formed is added 53.5 lbs. of paraformaldehyde. The temperature is held at 100° for two hours, then raised to 175° for one hour. The pressure is reduced to about 10 mm. and temperature raised to 200° and held for one-half hour to complete the reaction. The properties can be varied by varying the proportion of formaldehyde. The resin obtained is suitable for making surface coatings which dry rapidly and have good hardness, resistance to water and alkalies, and are durable.

Soluble copolymers of polymerizable monomers and drying oil acids—unsaturated dicarboxylic acid—polyhydric alcohol esters and process of making them. F. B. Root. *U. S. 2,559,465.* A diglyceride is made by heating linseed oil acids (4 moles) with glycerol (2 moles) for ten hours at 185-215°. To .8 mole of this diglyceride is added .4 mole of maleic anhydride. The mixture is agitated one hour at 170° to give the half ester. A mixture of 120 pts. of the half ester and 96 pts. of styrene is refluxed for 6.2 hours at 155-160° using 0.4% benzoyl peroxide as catalyst. The mixture is then heated for fifteen minutes at 165-230° under vacuum to remove unreacted styrene and cause esterification. A clear amber colored semi-solid material containing 41% reacted styrene is obtained. A solution of this containing drier dries tack free in four hours.

Acid-modified copolymers of drying oil acids, maleic-polyhydric alcohol esters, and process of making same. F. B. Root. *U. S. 2,559,466.* This is an extension of *U. S. 2,559,465* through modification of the described alkyd with rosin, chloro styrenes and phthalic anhydride.

Alkyd resin. C. J. Opp and R. E. Werner. *U. S. 2,560,592.* A modified alkyd resin is made as follows: First, dehydrated castor oil (60 pts.) is styrenated with styrene (40 pts.) at 260°, using tertiary butyl hydroperoxide as catalyst and tertiary butyl mercaptan (.5-5% of styrene) as modifier. One hundred parts of this styrenated product is then cooked at 230° with 14 parts of glycerol using a trace of calcium oxide as catalyst. Heating is continued until the product is clear, then phthalic anhydride (31 pts.) is added and heating continued at 230° until acid number drops to 45. At this point more glycerol (3.5 pts.) is added and cooking continued until the acid number is less than 20. The resin can be compounded with melamine-formaldehyde resins to give coatings of excellent soap resistance. Normally styrene copolymers are not compatible with melamine-formaldehyde resins.

Styrene fatty oil polyallyl ether copolymers. J. R. Roach. *U. S. 2,562,537.* A drying oil is prepared from soybean oil by a series of reactions involving allyl sucrose and styrene, e.g. a mixture of soybean oil (100 pts.) and allyl sucrose (D.S.= 6.3) (66 pts.) is blown at 135° for two hours. The mixture is cooled to 110° and styrene (27 pts.) is added in three portions over a five-hour period. The temperature is held another two hours. The unreacted styrene is stripped off giving a light amber colored polymer. A film of this product with drier has good resistance to hot and cold water, dilute acid, dilute alkali, and common organic solvents.

Shrinkproofing of wool. M. R. Coe, Jr. *U. S. 2,562,603.* Wool is shrink-proofed by treating with either a 3% solution in mineral spirits or water dispersion of tung oil. This puts a thin coating about .0001 in. (1-15% of wt. of wool) or less on the fibers. The film is cured on the wool by heating to 150° for 15 minutes. When 8% of tung oil is deposited on the wool and cured it reduces shrinkage on washing from 30% down to 2.5%.

Interpolymerization of vinyl aromatic compound and oil modified alkyd in the presence of sulfur. W. T. Craven. *U. S. 2,563,784.* A styrenated oil-modified alkyd is prepared as follows: linseed oil fatty acids (285 g.), glycerol (120 g.) and phthalic anhydride (203 g.) are heated to 260° and held there for one hour. The oil modified alkyd so prepared (150 g.) is mixed with styrene (75 g.) and sulfur (1 g.) then heated under reflux so that a reaction temperature of 205° is reached in four hours. The product with conventional amounts of lead and cobalt driers gives slightly opalescent films which touch dry in three hours.

Drying oils and varnish constituents. *Dutch 67,571.* Film-forming compounds are prepared by esterifying drying oil fatty acids with polyhydric alcohols which leave part of their hydroxyl groups etherified by unsaturated alcohols; the monoallyl ether of glycerol is used preferably. Other examples are allyl ethers of erythritol, pentaerythritol, sorbitol, dextrose, and the corresponding 2-chloroallyl, cinnamyl or linoleyl ethers. Glycerol monoallyl ether is prepared from allyl alcohol and epichlorohydrin or from 1-chloro-2-propene and glycerol. A drying oil can be prepared as follows: glycerol 1-allyl ether (32 g.) is mixed with oleic acid (140 g.) and slowly heated to 230° and kept at this temperature under CO_2 for four hours. The product is an amber colored oil which air dries. An alkyd type can be prepared from glycerol 1-allyl ether (60 g.) phthalic anhydride (45 g.) and a mixture of linseed fatty acids by heating to 230°. (*Chem. Abs.* **45**, 6856)

• Waxes

E. H. McMullen, Abstractor

The isolation of some homologous higher molecular weight glycols from the unsaponifiable fraction of wool wax. D. H. S. Horn and F. W. Hougen (National Chemical Research Laboratory, South African Council for Scientific and Industrial Research, Pretoria). *Chemistry and Industry* **1951**, 670. A chromatographic separation of the unsaponifiable material of wool wax has revealed the presence of a new series of organic components characterized as alkyl-1:2-diols. Five of these diols ranging in chain length from C_{16} to C_{24} were isolated.

Preparation of lanolin from wash water of wool. N. Haidee. *Mon. farm. y terap.* (Madrid) **57**, 177-8(1951). The soap present is decomposed with H_2SO_4 while air is blown through the liquid. Fatty acids and lanolin rise to the surface while dirt containing some fat settles to the bottom leaving a clear liquid. The aqueous medial layer is siphoned off, the solids dried, extracted with C_6H_6, the solution is washed with KOH in EtOH, and the C_6H_6 is distilled off. As an alternative method ultracentrifugation between 45 and 70°, and a pH below 8 is described. The crude fat is freed of acids with KOH in EtOH, bleached with oxidants and deodorized with superheated steam. (*Chem. Abs.* **45**, 6859)

The state of wax analysis. Leo Ivanovszky. *Seifen-Ole-Fette-Wachse* **77**, 213-19(1951). A discussion of the various chemical and physical analyses of waxes and their significances. (*Chem. Abs.* **45**, 6859)

The concept "wax" and its significance. C. Lüdecke. *Seifen-Ole-Fette-Wachse* **77**, 77(1951). Comments on the work of Ivanovsky. ***Reply.*** L. Ivanovsky. *Ibid.* 147-8. (*Chem. Abs.* **45**, 6859)

Centrifugal clarification of waxes and varnishes. C. M. Ambler (Sharples Corp., Philadelphia, Pa.). *Soap Sanit. Chemicals* **27**, No. 2, 118-20(1951). The use of centrifuges in two fields of surface coatings, crude waxes and wax emulsions, is discussed. (*Chem. Abs.* **45**, 4058)

Cooperative investigations of the German Association for Fat Research. XVIII. Important questions in the field of waxes. Introduction. H. P. Kaufmann (Univ. Münster Westfalen, Ger.). *Fette u. Seifen* **52**, 729(1950). **Definition and classification of waxes and waxlike materials.** C. Lüdecke. *Ibid.* 729-32. **Discussion.** G. v. Rosenberg. *Ibid.* 723-3. **Reply and Summary.** F. Gieser. *Ibid.* 733-5. (*Chem. Abs.* **45**, 6859).

Sperm oil. Brit. Standards Inst., London, S. W. 1. *Brit. Standard* 997:1951. Specifies the limits of volatile matter and dirt, I no., color, sp. gr., acidity, and content of unsaponifiable matter for 4 grades of crude oil and one of filtered oil. Gives methods of determination. (*Chem. Abs.* **45**, 6857)

Production and refining of montan wax. S. Rosiński and A. Swieca. Przeglad Górniczy **6**, 503-7(1950). A review with 18 references. (*Chem. Abs.* **45**, 6859)

The problem of resinification of turpentine-oil creams. W. Lützkendorf (Leverkusen, Ger.). *Seifen-Ole-Fette-Wachse* **77**, 221-3(1951). The addition of antioxidants (thymol, 2-naphthol, diphenylamine) and of basic dyes to shoe creams prepared with Spanish turpentine oil (d. = 0.850) prevents an increase of the acid no.; the addition of montan wax delays the increase. (*Chem. Abs.* **45**, 6859)

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Extracting wax from cachaza. O. J. Swenson (to Cuban-American Sugar Co., and S. C. Johnson & Son, Inc.). *U. S. 2,554,073.* Cachaza (sugar-mill filter-press cake) containing 85% water, heated and agitated to a fluidized state and in combination with bagacillo as a filter aid, is brought into countercurrent contact with an upward-moving water-immiscible organic solvent, such as heptane. The solvent could be aliphatic hydrocarbons distilling completely at 230°F. or benzene, toluene, xylenes, etc., chlorinated hydrocarbons, and lower alkyl acetates. (*Chem. Abs.* **45**, 6860)

• Detergents

Lenore Petchaft, Abstractor

Determination of free sodium hydroxide and sodium carbonate in soaps. I. P. Wolff. *Riv. ital, essenze, profumi, piante offic. olii vegetali, saponi* **32**, 94-5, 134-5(1950). The Na_2CO_3 is determined by insolubilizing it with absolute alcohol. (*Chem. Abs.* **45**, 4949)

Detergency properties of systems containing a solid nonionic detergent. H. R. Suter and M. G. Kramer (Wyandotte Chemicals Corp., Wyandotte, Mich.). *Soap Sanit. Chemicals* **27**, No. 8, 33-6, 149(1951). Laboratory detergency tests indicate that mixtures selected from the ternary system comprising "Pluronic F68," "Kreelon 4D," "Carbose D" are particularly suitable for hard water detergency. The detergency data for this system containing a solid nonionic detergent permits selection of a free flowing organic detergent base composition which is suitable for use with builders or for further formulation into a completely built detergent. Detergency data indicate that when properly built with sodium tripolyphosphate and soda ash this organic detergent base compares favorably with materials having proven effectiveness for cotton detergency in either soft or hard water.

Detergent sanitizers. M. A. Lesser. *Soap, Sanit. Chemicals* **27**, No. 8, 37-9, 67, 69, 98(1951). Review of use of quaternary ammonium compounds in formulations of detergent sanitizers. The detergent to be used in these products should be a nonionic type. Modifying the nonionics with alkalies raises soil removing ability of detergent-sanitizers substantially. The alkalies selected should be of the emulsifying rather than saponifying type.

Solvent-detergent products. A. Davidsohn. *Soap, Sanit. Chemicals* **27**, No. 8, 47, 49, 149(1951). Review of preparation of solvent-detergent products by sulfonating a starting material such as dodecyl benzene, mixing sulfonate with solvents such as kerosene and isopropanol and neutralizing with caustic soda. In this way, most of the commercially available alkyl aryl sulfonate detergents normally insoluble in cold nonpolar solvents may be combined with solvents to produce an all-purpose detergent.

Improvement of cotton cloth in resistance to soiling and in ease of washing. W. P. Utermohlen, Jr., Mary E. Ryan and Doris O. Young (Institute of Textile Technology, Charlottesville, Virginia). *Textile Research J.* 21, 510-21(1951). The general problem of producing resistance to soiling in cotton textiles is presented, and the effects of a number of treatments upon the ease of soil acquisition by cotton cloth and upon the ease of soil removal from the soiled cloth by washing are described.

Precipitated chalk as an abrasive in soap powders. Anon. *Am. Perfumer Essent. Oil Rev.* **58**, 126(1951). Precipitated chalk offers the following advantages for use in scouring powders and abrasive soaps: it has no odor or taste, and does not mask perfumes, it will not affect the alkalinity of the soap, is easily mixed with tinted ingredients, can produce very fine powders, and has excellent bulking properties.

Points on the drying of soap. P. I. Smith. *Am. Perfumer Essent. Oil Rev.* **58**, 125-6(1951). It is not possible to prescribe drying conditions for all soaps from past experiences. It is necessary to be able to modify drying conditions quickly and efficiently so as to suit specific makes of soap. The better the quality of the soap stock, the easier it is to achieve uniformity in drying. Soaps made from oils containing highly unsaturated fatty acids are more difficult to dry than those from saturated fatty acids. Color bodies and impurities are also potential sources of trouble.

The use of nonionic retarding assistants in the textile industry. J. A. Van der Hoeve. *Textielwezen* 6, No. 11, 66-9(1950). Polyethylene oxide derivatives (I) combine with vat dyes (II), thus increasing the molecular weight and retarding dyeing. I are more efficient when the hydrocarbon chain is long and attached by an ether linkage, and when the polyether chain is long. II are more susceptible to retarding action when the number of fused benzene rings is greater. Theories are given for these effects, as well as for the influence of anionic assistants. *Chem. Abs.* **45**, 4929)

Measurement of the adsorption of surface-active agents at a solution/air interface by a radiotracer method. D. J. Salley, A. J. Weith, Jr., Ann A. Argyle and J. K. Dixon (American Cyanamid Co., Stamford, Conn.). *Proc. Roy. Soc.* **A203**, 42-55 (1950). The adsorption of a water soluble surface-active agent at the solution/air interface was measured by taking advantage of the soft β-radiation from the radioactive isotope S^{35}. Purified di-n-octyl Na sulfosuccinate and sodium sulfate were each synthesized with S^{35}. The radiotracer technique permitted a successful determination of the adsorption. Counting rates over the solutions of agent were 1.1 to 20 times those of the corresponding sodium sulfate and for some 29 different solutions. A well-defined adsorption isotherm resulted. The surface excess agreed with that calculated from surface tension measurements by the Gibbs equation if it was assumed that no sodium ions and only H ions were associated with the long-chain ions adsorbed in the interface. After the agent had formed a unimolecular layer, a further increase in bulk concentration caused further adsorption at the interface. The rate of adsorption was followed in the low-concentration ranges. Other radio-isotopes having sufficiently soft radiation, such as C^{14}, Ca^{45}, Fe^{59}, etc. could be used. The method appears to open considerable possibility for examining interaction in surface layers. The application of the method to the study of surface phenomena in systems containing several surface-active materials is under consideration. In the case of such mixtures measurements of surface tension are not capable of yielding data that can be interpreted simply, but the tracer method will indicate the presence and amount of the tagged agent in the interface. (*Chem. Abs.* **45**, 4522)

Nomograph for the determination of the yield of soaps from neutral fats and fatty acids. Karl Stolzle. *Seifen-Ole-Fette-Wachse* **77**, 158-61(1951). A nomograph for the calculation of soap yields is described and illustrated with examples. (*Chem. Abs.* **45**, 6860)

Analysis of laundering and cleaning compounds. Qualitative identification of phosphates. Richard Neu (Univ. Munster Westfalen, Germany). *Fette u. Seifen* **53**, 148-9(1951). Alkyldimethylbenzylammonium chloride (I) gives a precipitate with metaphosphates and tripolyphosphates (II) in AcOH solution. Only the II precipitate is soluble in excess I. Pyrophosphates do not react with I. (*Chem. Abs.* **45**, 6860)

Identification of the phosphate in laundering compositions. E. Heinerth (Fa. Henkel u. Cie., G.m.b.H., Dusseldorf, Germany). *Fette u. Seifen* **53**, 31-4(1951). A scheme for the identification and determination of phosphates is given. Organic matter is removed first by alcohol extraction. Orthophosphates give a yellow precipitate with $AgNO_3$ in neutral solution. Pyrophosphates (I) give characteristic crystals of $Na_4P_2O_7 \cdot 10H_2O$ when Me_2CO is added to a solution of a 1 g. sample in 10 ml. N NaOH. I in aqueous solutions neutralized with 0.5 N $AgNO_3$ to methyl red gives an immediate white precipitate with a solution of 50 g. $Zn(OAc)_2 \cdot 2H_2O$ and 125 ml. of glacial AcOH in 1 liter of water. This precipitate, if any, is filtered off; in the presence of tripolyphosphates (II) characteristic crystals of $Zn_2NaP_3O_{10} \cdot 9H_2O$ form slowly in the filtrate (12 hours or longer). Since the structure is slightly changed in the presence of sulfates, metaphosphates, etc. the presence of II should be confirmed by chemical analysis of the crystals obtained. Interfering substances and their elimination are discussed and quantitative methods are reviewed. (*Chem. Abs.* **45**, 6860)

Relations between constitution and properties of substances of surface activity and detergent action. H. Stupel (Seifenfabrik Hochdorf, Switz.). *Seifen-Ole-Fette-Wachse* **77**, 182-6, 233-6, 256-8(1951). A review of the influence of the constitution of synthetic detergents on detergency, soil suspending power, soil-peptization, resistance to hard water, resistance to alkalies and acids, foaming power, foam stability, wetting power, emulsifying power, hydroscopicity, affinity to cellulose and protein fibers, reaction (pH), color and odor. (*Chem. Abs.* **45**, 6859)

Evaluation of detergents. Correlation of washing performance with dissolving and wetting ability. C. C. Ruchhoft and Francis I. Norris (Environmental Health Center, Cincinnati, Ohio). *U. S. Pub. Health Repts.* **66**, 655-67(1951). No single factor of detergency can be used to judge washing performance of the detergent. If the detergent is classified as a soap, surfactant, alkali, or combined detergent, a comparison of certain pertinent detergency factors will permit prediction of the washing performance of a large percentage of detergents. With present knowledge, a washing performance test is the only reliable method for evaluating the dish washing performance of detergents. (*Chem. Abs.* **45**, 6859)

Testing laundering compositions for skin compatibility. R. Herrmann (Justus-Liebig-Hochschule, Giessen, Ger.). *Fette u. Seifen* **53**, 146-8(1951). Methods are discussed and a simple agitator is described for hand washing tests. Use of the agitator increased reproducibility. (*Chem. Abs.* **45**, 6860)

PATENTS

Detergent composition. J. J. Ayo, F. J. Gajewski and H. L. Sanders (General Aniline and Film Corp.). *U. S. 2,560,839.* A liquid detergent composition useful in washing machines because of low-foaming properties consists of a mixture of oleyl or stearyl alcohol polyglycol ether, a small amount of an alkali metal soap, an alkali metal pyrophosphate, and a N,N-tetracarboxy-methylethylene diamine as corrosion inhibitor.

Wetting and detergent composition. E. A. Vitalis (American Cyanamid Company). *U. S. 2,562,155-6.* A wetting and detergent composition consisting essentially of a higher alkyl sulfosuccinate and a member of the group consisting of water-soluble magnesium beryllium and cobalt salts which are capable of increasing the water solubility of the sulfosuccinates.

Washing compositions for sea water. N. V. Dobbleman. *Dutch 67,413.* The washing agents to be used in hard water or sea water according to *Dutch 66,550*, consisting of soap and alkali fluorides are improved by using the fluorides in a readily soluble form and the soap in a form which dissolves more slowly, in order to form Ca, Mg, Fe, and Mn ion complexes with F ions to soften the hard water before the soap is dissolved. E.g. (1) coarse soap granules are mixed with NaF powder 1:1 or 1:3. (2) Dry soap powder is coated with a molten mixture of Na_2SO_4, Naf, and a small quantity of water. (*Chem. Abs.* **45**, 6861)