containing or likely to contain chlorophyll. For objects not likely to contain chlorophyll, the choice of peak wavelength for the red would be near 600 mμ. Our equations are:

For unbleached oils
a) $\text{Color} = 70.6D_{550} - 10.7D_{670}$
For bleached oils
b) $\text{Color} = 4.7D_{460} + 34D_{550}$

In a companion paper, "The Effect of Chlorophyll on the Color and Value of Oils," published in the Journal of The American Oil Chemists' Society, the development of these values is shown.

REFERENCES

1. Judd, Deane B., "Color in Business, Science, and Industry,"
2. McNicholas, H. J., "Color and Spectral Transmittance of Vegetable Oils," Bureau of Standards, RP 815, Vol. 15, August, 1935.

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

• Oils and Fats

R. A. Reiners, Abstractor

Fractional determination of free and esterified vitamin A. M. Aoyama (Kitasato Inst., Tokyo). *Kitasato Arch. Exptl. Med.* 25, 63(1952). Approximately 10 mg. liver oil (containing less than 10 γ vitamin A alcohol and less than 20 γ of its ester) is dissolved in 5 ml. petroleum ether. One ml. of this solution is passed twice through an alumina column. The ester comes through quantitatively and the alcohol is removed by using 2 ml. of benzene or 20% acetone in petroleum ether. The fractions are analyzed by the glycerol dichlorohydrin or fluorometric method. Most liver oils contain about 97% ester and only 3% alcohol. (*Chem. Abs.* 47, 3392)

Direct determination of the genuine vitamin A in liver oils. M. Aoyama (Kitasato Inst., Tokyo). *Kitasato Arch. Exptl. Med.* 25, 65-66(1952). Directions are given for the preparation of an activated alumina suitable for separating vitamin A alcohol and ester. (*Chem. Abs.* 47, 3392)

Effects of high-intensity electron bursts upon various vegetable and fish oils. A. Astrack, O. Sorbye, A. Brasch and W. Huber (Electronized Chemicals Corp., Brooklyn, N. Y.). *Food Research* 17, 571-83(1952). The effects of sterilizing doses of high-intensity electron bursts on cottonseed oil, castor and linseed oils, as well as cod-liver, herring, mackerel, and whale oils were examined by chemical and organoleptic methods. The radiation mechanism includes polymerization, bond breakage, as well as a variety of oxidative changes. The organoleptic changes in irradiated oils are not parallel with chemical changes and are uninfluenced by the presence or absence of antioxidants. Oxygen as well as air plays a role in the formation of radiation-induced off-flavors since treatment in vacuum or under inert gases successfully inhibits off-flavors. (*Chem. Abs.* 47, 3009)

New salts of undecenoic acid. A. Calo and Olga Mariani-Marelli (Ist. super. sanita, Rome). *Ann. chim.* (Rome) 41, 594-9; *Rend. ist. super. sanita* (Rome) 14, Pt. 9, 647-53(1951). Three new salts of 10-undecenoic acid, which may have pharmaceutical applications, have been prepared: $Hg(C_{11}H_{19}O_2)_2$, $Al(C_{11}H_{19}O_2)_3$, and $BiO(C_{11}H_{19}O_2)$. (*Chem. Abs.* 47, 3231)

A study on the determination of polymerized fatty acids. G. N. Catravas and G. M. Knafo. *Oleagineux* 8, 139-140(1953). The acids are prepared from the polymerized oil and the monomeric acids precipitated as adducts by a methanolic solution of urea while the polymerized acids remain in solution. The maximum error is 3 to 5%.

The chemical composition in fatty acids of a grape fusel oil. P. Cattaneo, A. Iacobacci, Germaine K. de Sutton and A. R. Lynch (Univ. nacl., Buenos Aires). *Anales asoc. quim. argentina* 40, 150-9(1952). A residue, obtained from direct distillation of the oil, contained fatty acids. This is 10.5% of the crude fusel oil. The major acids were capric, caprylic, and lauric; the minor ones are caproic, myristic, palmitic, linoleic, probably isovaleric, and saturated acids containing more than 16 C atoms. Small amounts of monoethylenic acids of 6-16 C atoms are also present. (*Chem. Abs.* 47, 3008)

Synthesis of some effective antioxidants. L-C Chiang and O. Gisvold (Univ. of Minnesota, Minneapolis). *J. Am. Pharm. Assoc., Sci. Ed.* 41, 348-51(1952). Some new biphenyltetrols were prepared for use as antioxidants. The antioxidant properties of 2,2′,3,3′-biphenyltetrol, 5,5′-diethyl-2,2′,3,3′-biphenyltetrol, and 3,3′-dimethoxy-2,2′,5,5′-biphenyltetrol were determined by the Swift stability test. In lard and oil they are less active than 5,5′-dimethyl-2,2′,3,3′-biphenyltetrol, but 3,3′-dimethoxy-2,2′,5,5′-biphenyltetrol with citric acid was more than twice as effective as the 5,5′-dimethyl derivative with citric acid or NDGA with citric acid in lard. (*Chem. Abs.* 47, 3282)

Determination of the saponification equivalent of low boiling esters. R. Davis (North Central College, Naperville, Ill.). *Chemist Analyst* 42(1), 20(1953). The apparatus described by Shriner and Fuson is modified by attaching a balloon to the side arm of the reflux tube.

Some oxidation products of dl-α-tocopherol obtained with ferric chloride. V. L. Frampton, W. A. Skinner and P. S. Bailey (Univ. of Texas, Austin). *Science* 116, 34-5(1952). Five products, 4 colored oils and a colorless wax, were isolated from the oxidation of *dl-α*-tocopherol with $FeCl_3$ in methanol. (*Chem. Abs.* 47, 3306)

The technique of extracting olive oil without pressure and solvent. G. Frezzotti. *Oleagineux* 8, 141-145((1953). The numerous methods proposed to replace pressing are divided into 5 groups and discussed. It is concluded that none of them is likely to replace the classic methods of grinding and pressing.

Determination of lipides. A density gradient method. A. Gibor and P. L. Kirk (Univ. of California Med. School, Berkeley). *Mikrochemie ver. Mikrochim. Acta* 40, 182-8(1952). The amount of dissolved fat in a heavy organic solvent is determined by measuring the density of the solution. Chloroform solutions of known concentrations of fat were used as standards by suspending them in the density gradient tubes. The density of any other sample could then be evaluated by introducing a drop into the same tube. Saturated $CdCl_2$ solution was diluted to the various concentrations needed for the gradient preparation with each of the diluted solutions saturated with chloroform. About 0.15 γ of lipide can be detected. (*Chem. Abs.* 47, 3007)

Stability of drum-cooled fat. E. Gol'dman and M. Makeeva (A. I. Mikoyan, Meat Combine, Moscow). *Myasnaya Ind. S.S.S.R.* 23, No. 6, 32-5(1952). In 26-31 day storage periods animal fats cooled at room temperature 20-25°, were practically as stable as fats cooled on a drum refrigerated at −8 to −13°. Tests for moisture, acid no., and peroxide no. were made. (*Chem. Abs.* 47, 3005)

Determination of fatty acids by potentiometric titration. B. W. Grunbaum, F. L. Schaffer and P. L. Kirk (Univ. Calif., Berkeley). *Anal. Chem.* 25, 480-2(1953). Microgram quantities of fatty acids were titrated with dilute base produced by an ion exchange column. End points were determined potentiometrically with a glass electrode in a CO_2 free atmosphere.

Determination of the sebaceous secretion on the dorsal region of the hand during the summer period. K. Iversen (Washington Univ., St. Louis, Mo.). *Acta Dermato-Venereol.* 32, 206-8 (1952). The 24-hr. sebaceous secretion of the dorsal region of the hand during the summer months averaged 11.6 γ of lipide per sq. cm. of skin. (*Chem. Abs.* 47, 3442)

Determination of the skin lipide secretion in the dorsal region of the hand. S. G. Johnsen (Washington Univ., St. Louis, Mo.). *Acta Dermato-Venereol.* 32, 168-73(1952). The 24-hr. lipide secretion of the dorsal region of the hand during the winter months averaged 13 γ per sq. cm. for 75 individuals aged 13-93. The magnitude of the secretion was not affected by age or sex. (*Chem. Abs.* 47, 3442)

The use of chestnut-bark extract as an inhibitor of rancidity of salted fish. C. Kelaidites. *Prakt. akad. Athenon* 25, 334-43 (1950). Experiments on freshly prepared salted fish showed that addition of commercially prepared extract of chestnut bark to the brine in the proportion of 2 parts per thousand retarded the development of rancidity of the dried fish. (*Chem. Abs.* **47**, 3488)

Semi-industrial molecular distillation of oil and fat. I. Concentration of vitamin A from shark-liver oil. S. Komori, S. Kikuchi, K. Hachiya, A. Shinsugi and T. Agawa (Osaka Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54**, 225-7(1951). The efficiency attained with a falling-type molecular still having 600 sq. cm. evaporation area and capacity of 10 l. of feed oil per hr. was the same as with laboratory operation. (*Chem. Abs.* **47**, 3010)

Fatty acid from fruits of umbelliferae plants. IV. Fatty acids from the fruit oil of Foeniculum vulgare. G. Kurono and T. Ishida (Univ. Kanazawa). *J. Pharm. Soc. Japan* **72**, 684-5 (1952). Ether extraction of 667 g. dried fruit powder and steam distillation of the oil gave 45 g. volatile oil and 110 g. residual oil; fractionation of the methyl ester of residual oil and saponification of the fraction yielded 86% solid acid as petroselinic acid, m. 32-3°, and 14% liquid acid which was mostly linoleic acid. (*Chem. Abs.* **47**, 3008)

Fatty acid from fruits of umbelliferae plants. V. Fatty acids from the fruit of Angelica glabra. F. Kurono and T. Sakai. *J. Pharm. Soc. Japan* **72**, 686-7(1952). Ether extraction of 550 g. of the fruit and steam distillation of the oil give 100 g. residual oil and 3.5 g. volatile oil. Residual oil contained 35% solid acid (large amount of petroselinic acid) and 65% liquid acid consisting mostly of linoleic acid (*Chem. Abs.* **47**, 3008)

Fatty acids from fruit oil of umbelliferae. VI. Elaidination of petroselinic acid. G. Kurono, T. Sakai and T. Ishida (Univ. Kanazawa). *J. Pharm. Soc. Japan* **72**, 1434-6(1952). Petroselinic acid in plants underwent elaidination to petroselaidic acid by irradiation with ultraviolet light. Elaidination did not take place with heating, saponification with alkali or with dilute acid. Petroselaidic acid, m. 53°, obtained from the fruits of *Anthriscus sylvestris,* is a normal constituent of the oil, though present in small amount. (*Chem. Abs.* **47**, 3008)

Fatty acids from fruit oil of umbelliferae. VII. Fatty acids from the fruit oil of Conioselinum univittatum turcz. G. Kurano and T. Sakai. *J. Pharm. Soc. Japan* **72**, 1436-9(1952). The fruits (490 g.) gave 55 g. fat acids. Palmitic acid, petroselinic acid and linoleic acid were found. (*Chem. Abs.* **47**, 3008)

Physical and chemical constants of edible oils and fats. A. LaCerda. A reprint from *Revista da Sociedade Brasileira de Quimica.* **20**, Nos. 1-4(1951). A tabular review in booklet form of 17 pages of the physical and chemical constants of fats and oils obtained from 81 plants with 118 references.

Fatty acids. II. Separation of fatty acids of soybean oil and the esters of the separated fatty acids and sorbitol. S. Maruta (Yamanashi Univ., Kofu). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54**, 234-5(1951). The amounts of soybean-oil fatty acids solidifying from a 10% solution in acetone at various decreasing temperatures are tabulated. (*Chem. Abs.* **47**, 3008)

The extraction of oil from fresh coconut kernels. P. H. Mensier. *Oleagineux* **8**, 75-78, 131-134(1953). The methods that have been patented for the extraction of oil from fresh coconut kernels rather than from copra are discussed. It is concluded that such methods eventually will replace copra operations.

Lipides and total nitrogen in the central nervous tissues of vertebrates. T. Mihara (Kyushu Univ., Fukuoka). *Kyushu Mem. Med. Sci.* **3**, 11-20(1952). Cephalin, sphingomyelin, cerebroside, total cholesterol, crude protein, and total ash were present in the whole cerebrum in higher concentration in mammals than in lower-class vertebrates, but lecithins, total N, and ash were in lower concentration in mammals than in lower-class vertebrates. (*Chem. Abs.* **47**, 2858)

Saponification of fatty oil by carbonated alkali under ordinary pressure. J. Mikumo, Y. Setsuda and K. Mamiya (Nagoya Univ.). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54**, 342-4(1951). The saponification velocity of coconut oil has been determined at 99° ±1° in the presence of excess Na_2CO_3. It has been observed that saponification proceeds noticeably if a soap, as an emulsifier, is present in an amount more than 10% of the oil. Agitation is favorable for the reaction. (*Chem. Abs.* **47**, 3854)

Oil splitting by Twitchell method and the treatment of sweet water. II. Refining and concentration of sweet water. A. Nagata, M. Ebara, S. Igarashi and H. Nobori (Kao Oil & Fat Co., Tokyo). *J. Chem. Soc. Japan,* Ind. Chem. Sect. **54**, 338-9 (1951). The sweet water which underwent the treatments with ion-exchange resin and active charcoal is colorless and does not foam and gives no foots upon concentration. (*Chem. Abs.* **47**, 3584)

The odor of whale oil. I. R. Nodzu, K. Onoe, T. Hori and R. Goto (Kyoto Univ.). *J. Chem. Soc. Japan,* Pure Chem. Sect. **73**, 193-6(1952). Distillation (at 5-6 mm. Hg) removes acid, carbonyl, and peroxide compounds. (*Chem. Abs.* **47**, 3585)

The odor of whale oil. II. Free fatty acids. R. Goto, K. Onoe and T. Hori (Kyoto Univ.). *J. Chem. Soc. Japan,* Pure Chem. Sect. **73**, 196-7(1952). The acidic fraction of the volatile whale-oil distillate contains isovaleric acid, which was identified as its Pb salt, and formic, acetic, propionic, and butyric acids, which were identified by means of paper chromatography. (*Chem. Abs.* **47**, 3585)

The odor of whale oil. III. Carbonyl compounds. K. Onoe and T. Hori (Kyoto Univ.). *J. Chem. Soc. Japan,* Pure Chem. Sect. **73**, 275-8(1952). 2,4-Dinitrophenylhydrazine added to the neutral fraction of the volatile whale distillate, gives rise to 3 carbonyl derivatives. (*Chem. Abs.* **47**, 3585)

Increasing the iodine number of grapeseed oil by selective action of furfural. J. M. Nolla, E. Diaz, A. Alcon and C. Mataix. *Afinidad* **29**, 446-9(1952). In a countercurrent column at furfural: oil ratio from 4:1 to 6.4:1 and a reflux volume per volume of oil of 0.5-2 the extract is rich in unsaturated glycerides, as shown by the increase in iodine no. from 126.5 to a maximum of 144 and hydroxyl no. from 16.5 to 46. Best results were obtained with a furfural: oil ratio of 6:1. (*Chem. Abs.* **47**, 3009)

Acetol esters of fatty acids. Preparation and crystalline derivatives. C. Paquot and P. Hiep (Centre natl. recherche sci., Paris). *J. recherches centre natl. recherche sci., Labs. Bellevue* (Paris) No. **18**, 136-7(1952). The Na salt of a fatty acid with ClCH$_2$COMe yields 70-75% acetol ester. The acetol esters form easily crystallized oximes, 2,4-dinitrophenylhydrazones, and semicarbazones, thus providing compounds for identifying the fatty acids. (*Chem. Abs.* **47**, 3231)

Oil from the meat of sperm whale (Physeter catodon). T. Pedersen. *Norsk Hvalfangst Tid.* **41**, 296-8(1952). Two back muscles which contained 74.3 and 68.6% moisture and 1.6 and 28% oil, respectively, had oil which showed, respectively: saponification no. 138.0, 124.6; iodine no. 85.6, 77.4; unsaponifiable matter 35.3, 39.3%; and iodine no. of the latter 64.6, 63.8. These results agree with other published results from the same animal. (*Chem. Abs.* **47**, 3010)

The milk fat of sperm whale. T. Pedersen. *Norsk Hvalfangst Tid.* **41**, 300(1952). The milk contained 30% fat (ether extract) of iodine no. (Wijs) 161.5, saponification equivalent 302.0, neutralization equivalent of fatty acids 285.0, unsaponifiable matter 0.74%, acid no. 0.27, saturated acids 31.2% of 100 g. of acids, and equivalent weight of saturated acids 258.0. In many respects this fat resembles the milk fats of blue, fin, sei, and humpback whales, but the average equivalent weight of sperm-whale milk fat is higher. (*Chem. Abs.* **47**, 3010)

Esterification of fatty acids by the higher primary aliphatic alcohols in the presence of p-toluenesulfonic acid. R. Perron (Labs. Bellevue, Paris). *J. recherches centre natl. recherche sci., Labs. Bellevue* (Paris), No. **18**, 141-9(1952). It was suggested that esterification of a fatty alcohol by a fatty acid in the presence of p-MeC$_6$H$_4$SO$_3$H as catalyst may occur with the formation of an intermediate p-toluenesulfonic ester. This intermediate has been isolated in the etherification of an alcohol by dehydration in the presence of p-MeC$_6$H$_4$SO$_3$H. It was concluded that esterification proceeds by a different mechanism than etherification in the presence of p-MeC$_6$H$_4$SO$_3$H, although this acid is a catalyst for both reactions, and under the proper conditions both reactions may occur simultaneously and independently. (*Chem. Abs.* **47**, 3232)

Dielectric constants of fatty acids. I. Comparative study of the equations of Onsager and of Jatkar in relation to experimental data on pure liquids. R. P. Phadke (Indian Inst. Sci., Bangalore). *J. Indian Inst. Sci.* **34**, 189-207(1952). Previous work on dielectric constants, dipole moments, and dimeric structures of fatty acids is reviewed. By comparison, the dipole moment calculated from Onsager's equation is greater than the dipole moment calculated from Jatkar's equation. For the normal and iso saturated fatty acids and oleic and elaidic acids, the dipole moment (Jatkar) increases linearly with increasing temperature, owing to dissociation of these dimers, whereas for ricinoleic and ricinelaidic acids and the esters, it remains nearly constant; this indicates much less association for these monomers. The degree of association and the dipole moment are larger for the dimers of saturated fatty acids of lower molecular weight. (*Chem. Abs.* **47**, 3060)

Dielectric constants of fatty acids. II. Correlation between the structure and dielectric constant of fatty acids. R. S. Phadke (Indian Inst. Sci., Bangalore). *J. Indian Inst Sci.* **34**, 293-304(1952). The dielectric constants of propionic, *n*- and isobutyric, isovaleric, *n*- and isocaproic, caprylic, oleic, elaidic, ricinoleic, and ricinelaidic acids were measured over the temperature range 25-160°. The dielectric constant for these acids increases linearly with temperature, the temperature coefficient decreasing with increase in molecular weight. In general, normal acids have a higher ϵ than the corresponding iso-acids, the difference between the ϵ of *n*- and iso-acids decreasing with increasing molecular weight. Introduction of unsaturation into the fatty acid chain causes an increase depending on the no. of double bonds introduced. The substitution of an OH group for H in oleic acid (i.e., ricinoleic) causes an increase in ϵ. (*Chem. Abs.* **47**, 3061)

Reaction of ammonia with the oxide of oleic acid. G. V. Pigulevskii and I. L. Kuranova (A. Zhdanov State Univ., Leningrad). *Doklady Akad. Nauk S.S.S.R.* **82**, 601-2(1952). Treatment of the methyl esters of peach oil with peracetic acid gave the methyl esters of the corresponding oxide acids, which gave methyl oleate oxide, $b_{0.06}$ 161-3°, hydrolyzed to oleic acid oxide, m. 57-8° (from ethanol-petroleum ether). This with a 15-fold amount of NH_4OH in a sealed tube after 12 hrs. at 130° gave a product, m. 154-5° (from ethanol), which is either $C_8H_{17}CH(OH)CH(NH_2)(CH_2)_7CO_2H$ or the corresponding isomer. (*Chem. Abs.* **47**, 2703)

Composition of animal biles. Phospholipides of bile. M. Polonovski and R. Bourrillon (Univ. Paris). *Bull. soc. chim. biol.* **34**, 712-19(1952). Phospholipides make up 15-20% of the dry matter of bile. Compounds of fatty acids other than lecithin are absent. (*Chem. Abs.* **47**, 3427)

Studies on the origin of oxidized flavor in whole milk. E. G. Pont (Dairy Res. Sect., C.S.I.R.O., Melbourne, Australia). *J. Dairy Res.* **19**, 316-27(1952). The presence of copper greatly accelerated the development of off-flavors in milk. Marked off-flavors were always associated with peroxide values in the milk fat of 0.2 or more. The oily and metallic flavors noted in this milk could be reproduced by oxidizing milk fat in the presence of copper and reconstituting it with skim milk. The cardboard flavor, however, could be produced only by the action of copper in pasteurized skim milk.

Interrelationships of lipoic acids. L. J. Reed, Betty G. DeBusk, C. S. Hornberger, Jr., and I. C. Gunsalus (Univ. Texas, Austin). *J. Am. Chem. Soc.* **75**, 1271-3(1953). α-Lipoic acid is converted to β-lipoic acid by treatment with H_2O_2 or aqueous $KMnO_4$. This suggests that β-lipoic acid is an oxidized form of α-lipoic acid, probably a sulfoxide.

Isolation, characterization and structure of α-lipoic acid. L. M. Reed, I. C. Gunsalus, G. H. F. Schnakenberg, Q. F. Soper, H. E. Boaz, S. F. Kern and T. V. Parke (Univ. Texas, Austin). *J. Am. Chem. Soc.* **75**, 1267-70(1953). Procedures are described for the isolation of crystalline α-lipoic acid from acid hydrolyzed liver residue. α-Lipoic acid, which can replace acetate in its growth promoting function for some lactic acid bacteria, is the cyclic disulfide derived from 4,8-, 5,8-, or 6,8-dimercapto-*n*-caprylic acid.

The pressure processing of the most important European oil seeds with refining of the obtained oils. Part I. A. Rentenberger. *Seifen-Öle-Fette-Wachse* **79**, 125-127(1953). The preparation of the seeds and the production of oils by pressure processing are discussed.

The influence of moisture on the rate of extraction of press cakes by naphtha. D. Rossetti. *Olii minerali-Grassi e Saponi-Colori e Vernici* **30**, 1-5(1953). The influence of the presence of moisture on the rate of extraction of the oil with naphtha from peanut, colza, copra, flax and sesame press cakes obtained by continuous pressing was studied. It is concluded that moisture exerts a retarding action on the extraction of the oil without influencing the final quantity of oil extracted.

The chemistry of cork. IX. Contribution to the structure of phellonic acid. I. Ribas and G. G. Curbera (Univ. Santiago, Santiago de Compostela, Spain). *Anales real soc. espan. fis. y quim.* **47B**, 713-14(1951). Since phellonic acid and its acetyl derivative both form complexes with the same percentage of urea (75.87 and 75.51%, respectively), the authors prefer for phellonic acid the structure ω-hydroxybehenic acid rather than the structure 22-hydroxytetracosanoic acid whose acetyl derivative would be branched. (*Chem. Abs.* **47**, 2698)

The chemistry of cork. X. Contribution to the study of the formula of phellonic acid. E. Seoane, G. Gil-Curbera and I. Ribas. *Anales de la Real Sociedad Espanola de Fisica Y Quimica.* **49B**, 145-152(1953). By means of elementary analysis of phellonic acid, its methyl ester, fixing of the equivalent of neutralization and analysis of the potassium salt a decision is taken for the formula of phellonic acid between $C_{22}H_{44}O_3$ and $C_{24}H_{48}O_3$ and the C_{22} is chosen. By reducing the methyl-phellogenic half ester to phellonic acid and the dimethyl-phellogenic and methyl-phellonic esters to the same glycol, phellonic acid is identified as ω-hydroxy-behenic acid.

Influence of supersonics on oil and fat. I. Influence of supersonics upon the oil under atmospheric pressure. H. Sakurai (Osaka Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 246-8(1951). Rice-bran oil subjected to the action of supersonics does not undergo a noticeable change, whereas sardine oil does. Autoxidation is accelerated. (*Chem. Abs.* **47**, 3010)

Fat, fat constants, and phospholipide content of sow milk. B. E. Sheffy, P. H. Phillips, H. A. Dymsza, R. H. Grummer and G. Bohstedt (Univ. of Wisconsin, Madison). *J. Animal Sci.* **11**, 727-35(1952). The total fat and phospholipide content decreased with stage of lactation but the phospholipide content, when expressed as percent of the fat, did not vary significantly. The iodine no. of colostrum fat was higher than that of 15- and 30-day milk fat. The saponification and Hehner nos. were relatively constant. The composition of sow milk fat, as indicated by fat constants, resembles that of swine depot fats (*Chem. Abs.* **47**, 3426)

Selenium as a catalyst in cis-trans isomerization of unsaturated fatty acids. J. H. Skellon and J. W. Spence (Acton Tech. College, Acton, London, W. 3). *Chemistry & Industry* **1953**, 302. Contrary to published reports selenium was found to be an ineffective isomerization catalyst in concentrations from 0.15 to 0.30% at temperatures below 210° and a reaction time of one hour. A longer contact time (up to 8 hrs.) appears necessary.

Preparation of dihydroxystearic acid. J. C. Traynard (Faculte sci., Marseille). *Bull. soc. chim. France* **1952**, 323-4. An improved technique for the permanganate oxidation of oleic acid is described. (*Chem. Abs.* **47**, 3237)

Catalytic hydrogenation in the presence of water. V. Simultaneous hydrogenation and hydrolysis of the fatty oils of high acid value. S. Tsutsumi, Tadashi Yoshijima and M. Eto (Osaka Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 235-7(1951). Highly acid rice bran and embryo bud oils undergo hydrogenation and hydrolysis at 180° with NiO as the catalyst, the initial H_2 pressure being 20 atmospheres. Careful purification is necessary for the process. (*Chem. Abs.* **47**, 3010)

Determination of the iodine value of crude oils by the Kaufman method. T. Watanabe (Tamagawa Chem. Ind. Co. Tokyo). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 322-4(1951). The Kaufman iodine no. method can replace the Wijs method when the procedure is carried out at 20-30° with excess halogen (*Chem. Abs.* **47**, 3584)

Sinitiro Kawamura, Abstractor

Solubility of fats and oils. 1. Solubilities of linseed and rapeseed oils in furfural. Yoshirô Abe (Keiô Univ., Tokyo). *J. Oil Chemists' Soc., Japan* **1**, 169-71(1952). These oils and partially hydrolyzed oils from them were separately mixed with different amounts of furfural, and the mixtures were heated to observe the point of transparency, and then cooled slowly to observe the point of turbidity; the average temperature of the two points was defined as the point of solution. The solubility of oils in furfural increased as acid no., iodine no., and saponification no. increased. The lowest solubility was observed in the mixtures consisting of 20-30 oil and 80-70 furfural.

II. Solubilities of cottonseed, soybean, corn, peanut, and castor oils in furfural. Yoshirô Abe (Keiô Univ., Tokyo). *J. Oil Chemists' Soc., Japan* **1**, 171-4(1952). Except for castor oil which was miscible in any proportion with furfural, the same conclusion as in I could be obtained concerning the solubilities in furfural.

III. Solubilities of coconut, palm, and chrysalis oils and beef tallow in furfural. Yoshirô Abe (Keiô Univ., Tokyo). *J. Oil Chemists' Soc., Japan* **2**, 16-18(1953). Entirely similar conclusions to those of I were obtained.

IV. Solubilities of cod-liver, calamory, and sperm head oils in furfural. Yoshirô Abe (Keiô Univ., Tokyo). *J. Oil Chemists' Soc., Japan* **2**, 19-21(1953). Similar results to those of I were obtained.

Preparation of pentadecyl bromide from palmitic acid. Akemi Adachi and Nenokichi Hirao (Kinki Univ., Osaka). *J. Oil Chemists' Soc., Japan* **1**, 167-8(1952). Ag palmitate reacted with Br_2 in CCl_4 gave 73.5-77.4% pentadecyl bromide. Other solvents were not suitable: butyl ether and ethyl acetate yielded about 60% bromide; benzene, toluene, and petroleum naphtha, about 40%; others (chloroform, butyl bromide, bromobenzene, chlorobenzene, and ligroin), about 30% or less. Ca palmitate gave only 6-7% pentadecyl bromide in CCl_4. Mg palmitate did not react with Br_2 under similar conditions. Ag palmitate with Cl_2 gave 24-28% pentadecyl chloride.

The reaction of the metallic salts of fatty acids with halogen. II. Consideration of reaction mechanism and supplement to Part I. Etsurô Maekawa (Nagoya Engineering Coll.). *J. Oil Chemists' Soc., Japan* 1, 164-6(1952). Zn and Cd laurates gave a small amount of 1-bromohendecane when reacted with Br_2. Analyses of the reaction products of Ag laurate with Br_2 revealed the presence of 1-bromohendecane and lauric acid. As the reaction mechanism intermediate formation of free radical was considered.

Foams and defoaming. Jirô Mikumo (Nagoya Univ.). *J. Oil Chemists' Soc., Japan* 2, 51-54(1953). A review with 14 references.

Prevention of rancidity of edible oils. Seimi Satô, Masami Hôjô, and Yoshito Tazawa (Kôgyô Shidôjo, Aichi Pref.). *J. Oil Chemists' Soc., Japan* 1, 157-64(1952). Among 3 edible oils tested, coconut oil was the most apt to be rancid, hardened whale oil (I no. 47.0) was next, and hardened cottonseed oil (I no. 58.8) was the least apt to be rancid, when tested without antioxidant. NDGA (nordihydroguaiaretic acid) had superior antioxidant activity when used at 0.005-0.01%. Butyl parahydroxybenzoate was often ineffective as antioxidant; this was effective only for coconut oil with the addition of 0.005%. The degree of rancidity was tested by 3 methods: acid no., peroxide value [by the method of Drozdov and Starikova (*Chem. Abs.* **45**, 9281*d*)] and the Kreis color reaction (with Pulfrich photometer).

Fat-splitting agents. Kyôsuke Nishizawa (Tohoku Univ., Sendai). *J. Oil Chemists' Soc., Japan* 2, 2-3(1953). A review chiefly of the author's studies.

The seed oil of Cinnamomum camphora. Keiji Sekimoto and Nenokichi Hirao (Kinki Univ., Osaka). *J. Oil Chemists' Soc., Japan* 2, 4-5(1953). Extraction from seeds of *Cinnamomum camphora* with benzene gave 41.75% oil, d^{23} 0.9307, n^{23} 1.4498, acid no. 7.7, saponification no. 289.5, iodine no. 6.6, m.p. 20-22.5°, and unsaponifiable matter 2.2%. The mixed fatty acids consisted of 68% solid acids (iodine no. 0.2) and 32% liquid acids (iodine no. 26.2), when separated by the Pb salt-ethyl alcohol method. Fractional distillation of methyl esters of solid acids revealed the presence of capric and lauric (the chief constituents) and caprylic, myristic, and palmitic acids (in minor amounts). The Hazura oxidation of fatty acids obtained by saponifying fractionated methyl esters of liquid acids showed the presence of oleic acid and probably obtusilic acid (4-decenoic acid). Examination of saturated triglyceride showed the probable presence of caprolauromyristin.

Constituents of sperm oil. Hisakazu Senda (Dai Ichi Kôgyô Seiyaku Co., Tokyo). *J. Oil Chemists' Soc., Japan* 2, 6-10 (1953). Higher alcohols are prepared industrially from sperm oil by saponification with alkali and distillation with superheated steam in vacuo. The changes of the constituents of sperm oil during these treatments were investigated by comparing fatty acids and higher alcohols obtained industrially with those prepared in the laboratory. Decomposition of the highly unsaturated constituents occurred. They disappeared while lower monöolefinic hydrocarbons increased, and lower water-soluble fatty acids were formed. Formation of aldehydes and ketones due to pyrolysis of sodium salts of fatty acids was not observed. A part of the unsaturated fatty acids was transformed into trans isomers.

Inhibition of the autoxidation of fats and oils. II. The antioxygenic preperty of caffeic and dihydrocaffeic esters. Saburô Tamura, Kazuhiko Okuma, and Tadahiko Hayashi (Univ. Tokyo). *J. Agr Chem. Soc. Japan* 26, 410-12 (1952). Caffeic and dihydrocaffeic acid esters were synthesized and their effectiveness for stabilizing vitamin A in cod-liver oil was determined. As the standard antioxidant, ethyl gallate was added to liver oil at 0.05%; other compounds were compared on the equivalent molecular basis. The time in days for 50% loss of vitamin A shaken at 24° was as follows: control 11, ethyl gallate 46, methyl caffeate 32, ethyl caffeate 32, *n*-propyl caffeate 32, methyl dihydrocaffeate 35, ethyl dihydrocaffeate 35, *n*-propyl dihydrocaffeate 38, and ethyl protocatechuate 13.

III. The antioxygenic property of hydroxycoumarins. Saburô Tamura, Kazuhiko Okuma, and Tadahiko Hayashi (Univ. Tokyo). *J. Agr. Chem. Soc. Japan* 26, 413-14(1952). Twelve hydroxycoumarins were synthesized and the stability value as defined in Part II was compared: control 11, coumarin 11, 6-hydroxy-4-methyl-coumarin 11, 7-hydroxy-coumarin 11, 7-hydroxy-4-methyl-coumarin 11, 5,7-dihydroxy-4-methyl-coumarin 11, esculetin 21, 4-methyl-esculetin 17, 3,4-dimethyl-esculetin (new compd.) 31, 3-isopropyl-4-methyl-esculetin (new compd.) 25, 4-methyl-3,4-dihydro-esculetin (new compd.) 42, daphnetin 17, 4-methyl-daphnetin 14, 3,4-dimethyl-daphnetin (new compd.) 12, resorcinol 10, hydroquinone 48, and pyrogallol more than 50.

PATENTS

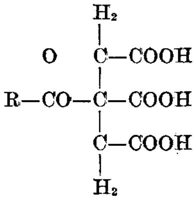
Stabilization of fats and oils. J. B. Martin (The Procter and Gamble Co.). *U. S. 2,634,213.* A shortening stabilized against oxidative deterioration at temperatures encountered in the deep fat frying of foods and suitable for use in cake baking is claimed, comprising nonfoaming fatty glyceride and a stabilizing amount of methyl silicone having a viscosity of at least 50 centistokes, the amount being not less than 0.03 p.p.m. and not more than 0.5 p.p.m. of the fatty glyceride.

Process for substantially complete conversion of fatty material to partial ester. N. H. Kuhrt (Eastman Kodak Co.). *U. S. 2,634,278.* The process is claimed which comprises admixing a fatty material, an alcohol and an ester-interchange catalyst, reacting the resulting mixture at a reaction temperature effective to cause substantial formation of a desired fatty acid partial ester, separating the partial ester from the composition while the composition contains the catalyst in active form, the separating being effected by spreading the composition in a thin film while maintaining the film at a temperature substantially below the decomposition temperature of the active catalyst and subjecting the composition while in the thin film to vacuum effective to distill the partial ester therefrom leaving a distillation residue containing the active catalyst, replenishing the distillation residue with make-up amounts of the fatty material and the alcohol and again effecting reaction of the replenished residue and separating partial ester formed thereby, and repeating the process at least until the amount of the partial ester being recovered is substantially equivalent to the amount of convertible fatty material being added to the distillation residue whereby substantially complete conversion of the fatty material to the partial ester is effected.

Preparation of monoglycerides. N. H. Kuhrt (Eastman Kodak Co.). *U. S. 2,634,279.* The process is claimed which comprises reacting fatty material and glycerine in the presence of an ester-interchange catalyst and thereby forming an equilibrium composition including a substantial amount of monoglyceride, and thereafter recovering substantially all of the monoglyceride from the composition before elapse of the reversion time interval which is in the range below the maximum values of 2 minutes at 400°, 10 minutes at 200° and 480 minutes at 100°, the recovery being effected by cooling the composition and separating unreacted glycerine therefrom and thereafter, while the composition contains the catalyst in active form, separating the monoglyceride from the composition by progressively spreading the composition in a thin film and vacuum distilling monoglyceride from the film, both the separatings being completed within the reversion time interval.

Recovery of fat from fat containing material. I. H. Chayen (British Glues and Chems. Ltd., Garden City, England). *U. S. 2,635,104.* Pieces of material containing fat in cells are subjected to intense impacts while surrounded by water whereby the cells are ruptured to release fat. The fat is scrubbed from the residues by the water and the resulting mixture of water, fat and residues is separated by difference of density to obtain a material of high fat content.

Antioxidant for fats and fatty oils. A. W. Schwab and H. J. Dutton (Sec. of Agr.). *U. S. 2,636,887.* Fats and oils are claimed having dissolved therein an ester represented by the structural formula



$$\begin{array}{ccl} & & H_2 \\ & & | \\ O & & C-COOH \\ & & | \\ R-CO- & & C-COOH \\ & & | \\ & & C-COOH \\ & & | \\ & & H_2 \end{array}$$

in which R is an aliphatic radical of at least seven carbon atoms.

Fractionation of oat oil and use of same. E. L. Washburn (The Quaker Oats Co., Chicago, Ill.). *U. S. 2,636,888.* A method is claimed of making an oat extract useful for addition to food products which comprises intimately contacting oat oil with an ether-methanol solvent, allowing the mixture to separate, removing the ether-methanol solvent from the upper layer, adding acetone to the ether-methanol extract with cooling and then separating the acetone insoluble product from the acetone.

Modified soybean lecithin. E. P. Jones and J. C. Cowan (Sec. of Agr.). *U. S. 2,636,889.* The method is claimed comprising reacting soybean lecithin containing about 27 to 35% glyceride oil and about 7 to 12% carbohydrates with one of the group consisting of aromatic and aliphatic isocyanates at temperatures in excess of 50° for a period of time at least until the odor of isocyanate disappears, the reacting proportions being from 0.2 mole to 4 moles of isocyanate per mole of soybean lecithin.

Methods for preparing peroxides of unsaturated fatty acids and the like. W. O. Lundberg (Regents, Univ. of Minn.). *U. S. 2,636,890.* The method is claimed of preparing peroxide concentrates which comprises reacting fatty acids or the soaps or monohydric alcohol esters thereof with a gas containing oxygen at a temperature in the range of 0° to 110° until the peroxide value of the reaction mass is in the range of about 50 to 3000 milliequivalents per kilogram and without the substantial formation of aldehydes, ketones or acids, partitioning the reaction mixture between a polar solvent and a non-polar solvent to yield a peroxide concentrate in the polar solvent.

Deodorization of chrysalis oil. Y. Nagai (Nissin Industrial Co.). *Japan. 179,944* (1949). The pupas are treated in dilute HCl or H_2SO_4, oil is extracted in a press or by use of a solvent, and the oil is boiled in water or steam distilled in vacuo to remove a low-boiling fraction. (*Chem. Abs.* **47**, 3588)

Castor-oil substitute. S. Yoritachi. *Japan, 4534('51).* A mixture of 100 kg. soybean oil, 10 kg. 95% acetic acid, 25 kg. 30% H_2O_2 is heated for 1 hr. at 65-75°, for 1 hr. at 79-90°, and then heated for 2 hrs. at 90-102°. The product is neutralized with alkali, washed with water, and dehydrated. (*Chem. Abs.* **47**, 3012)

Separation of free acid from rice oil. T. Nishimura. *Japan. 4630('51).* Rice oil (acid no. 102) 100, water 100, Na_2CO_3 17, and Na_2SO_4 3 parts are mixed for saponification of the fatty acid, the product is selectively hydrogenated with 0.6 part Raney Ni in H to obtain hydrogenated solid soap. Liquid neutral soap (42 parts) is separated. (*Chem. Abs.* **47**, 3012)

Refining of rice oil. S. Sumimoto. *Japan. 4934('51).* Crude rice oil having an acid no. of 130 (1 kg.) is treated with 2 volumes of 85% alcohol and refluxed for 10 min. to give 400 g. of oil with an acid no. of 30, and this is treated with NaOH, decolorizing clay, and dewaxed to give 220 g. refined oil. (*Chem. Abs.* **47**, 3012)

Prevention of increase of acidity of oil-containing rice bran. K. Tsujino, *et al. Japan. 5935('51).* Rice bran is heated 3-30 min. at 100-150°; the heating apparatus is described. (*Chem. Abs.* **47**, 3588)

Hydrogenation of fats and oils at high pressure. M. Hitosumatsu and Y. Takeshita. *Japan 5936('51).* Rice oil fatty acids are hydrogenated in the presence of 1% Ni and 1% trichloroethylene at 80 kg./sq. cm. for 2 hours at 180° to give a light-colored product, melting at 50°. (*Chem. Abs.* **47**, 3587)

Continuous centrifugal dewaxing. H. Marumo. *Japan. 6188 ('51).* Crude rice oil is mixed with 5 parts 10% $CaCl_2$ solution and centrifuged to obtain 75 parts dewaxed oil. (*Chem. Abs.* **47**, 3588)

Dibasic long-chain fatty acids. S. U. K. A. Richter and B. S. Berndtsson (Svenska Oljeslageriaktiebolaget). *Swed. 133,160.* Unsaturated long-chain monobasic acids are oxidized in the gaseous phase in the presence of an oxidation catalyst at 300-450°, and long-chain dibasic acids are isolated from the product, e.g., by crystallization, or by dissolving the product in alkali and separating the dibasic acids by fractional precipitation. Suitable catalysts for the oxidation are V, Fe, and Os compounds; with oleic, linoleic, or linolenic acid or tall oil as starting material, suberic and azelaic acids are obtained. (*Chem. Abs.* **47**, 3340)

Dibasic long-chain fatty acids. S. U. K. A. Richter and B. S. Berndtsson (Svenska Oljeslageriaktiebolaget). *Swed. 134,616.* The process of patent *Swed. 133,160* is modified by using, instead of the free monobasic acids, the esters of these acids with lower alcohols. E.g., a mixture of hot air and the vapor of technical methyl oleate is passed through a tube containing a catalyst made by spraying pure V_2O_5 onto 4 mm. Cu granules, heated to 425-550°. A yield of 21% azelaic and 6% suberic acid is obtained. Other starting materials are the esters of linoleic, linolenic, and tall-oil acids. Fe and Os compounds are alternative catalysts. (*Chem. Abs.* **47**, 3340)

• Biology and Nutrition

R. A. Reiners, Abstractor

Rapid method for calculating Stubbs correction in vitamin A assay. L. Korr (Chas. L. Huisking & Co., Brooklyn, N. Y.). *Chemists Analyst* 42(1), 15(1953).

The effect of various fatty acid fractions of coconut oil on calcium metabolism in normal growing rats. M. N. Rao and S. S. De (Indian Inst. Sci., Bangalore). *Indian J. Med. Research* **40**, 235-42(1952). The percentage of Ca utilized by young growing rats when fed a diet containing (a) 10% coconut oil was 52.2%; (b) 10% unsaturated fatty acid fraction of coconut oil was 64.2%; (c) 10% saturated fatty acid fraction of coconut oil was 49.1%; and (d) no fat was 46.0%. Apparently the utilization of Ca after the ingestion of the fat was dependent upon the acidity of the intestinal contents. Accordingly the decreased acidity of the intestinal contents on a fat-free diet may contribute to the lowered Ca utilization. When the fecal excretion of Ca was increased, the urinary excretion of Ca tended to decrease. (*Chem. Abs.* **47**, 2849)

• Drying Oils

Stuart A. Harrison, Abstractor

Fractionation of tall oil. D. H. Wheeler, R. J. Foster, and A. P. Berry. *Am. Paint J.* 37, No. 24, 62(1953). Fractionation of tall oil in commercial equipment is described. Tall oil can be separated into four fractions by continuous vacuum distillation. They are: (1) Low boiling color-odor fraction. (2) Fatty acid fraction. (3) Rosin acid fraction. (4) Pitch. Of these the second and third are of most importance. A fatty acid fraction can be produced having less than 2% rosin acids, and a rosin acid fraction can be produced having about 70% rosin acids. Both fractions have important uses in the coatings field.

Note on the influence of phenolic diterpenoids from some New Zealand conifers on the drying of linseed oil. C. W. Brandt. *New Zealand J. Sci. Technol.* **34B**, 65(1952). It is well known that linseed-oil paints applied to certain native timber, such as totara and rimu are retarded in drying time. This is attributed to the presence of resins, namely *totarol*, a diterpenic phenol in totara wood and related phenols, in rimu wood. When these phenols are isolated and added to linseed oil in 1-5% concentration they extend the drying time six to eight fold. The acetylated resins have no effect on drying time. (*Chem. Abs.* **47**, 2997)

Use of polyhydric alcohols in alkyd resin preparation. S. Creselius. *Official Digest Federation Paint and Varnish Production Clubs* **No.** 338, 175(1953). The use of different polyhydric alcohols in alkyd production is reviewed.

Flat alkyd paints. B. Farber. *Am. Paint J.* 37, No. 28, 66 (1953). The problems of preparation and use of flat alkyd paints are discussed. Paint formulations are given.

Copolymers of maleic anhydride. W. H. Gardner. *Am. Paint J.* 37, No. 29, 56(1953). The use of maleic anhydride and maleic anhydride adducts in the preparation of modified alkyds and polyesters is reviewed.

Methyl glucoside, a new industrial polyol for protective coatings. J. P. Gibbons. *Am. Paint J.* 37, No. 31, 70(1953). Methyl glucoside is a ring polyol having one primary hydroxyl group and three secondary hydroxyl groups. It was found, however, that two of the hydroxyls esterified with nearly equal ease whereas the other two esterified more slowly. Using litharge catalyst about 90% esterification can be obtained in 12 hours at 392°F. with linseed fatty acids. The glucoside oils body more rapidly than the corresponding pentaerythritol or glycerol esters. Varnishes made from the glucoside oils give films which dry faster to harder films with better water resistance than the corresponding varnishes made from pentaerythritol or glycerol oils.

Some recent developments in the analysis of paints and painting materials. N. W. Hanson. *Official Digest Federation Paint and Varnish Production Clubs* **No.** 338, 163(1953). Methods used in analysis of paints and vehicles are briefly reviewed. The use of infrared analysis on resins, oils, and pigments is described. In the infrared analysis of diene and triene esters the author believes that the bands observed at 10.0μ and 10.3μ for those with conjugated and with isolated double bonds is not due to conjugation but to presence of trans double bonds. The shift, however, is caused by conjugation.

The effect of pigments on the drying times of conjugated unsaturated oils. J. D. von Mikusch and K. Mebes. *Deut. Farber-Z.* **7,** 1(1953). The drying rates of paint films were compared. The vehicles were: lacquer linseed oil, isomerized linseed oil (50% conjugation), tung oil and dehydrated castor oil. Results showed that the oils containing conjugated unsaturation are more affected by pigments than the non-conjugated oils. Many formulations and drying times are given (*Chem. Abs.* **47,** 3580)

Co-operative research: exposure testing on a co-operative basis. A. Pass. *J. Oil and Colour Chemists' Assoc.* **36,** 151(1953). An account is given of the problems encountered in conducting paint exposure tests on a co-operative basis. Attention is drawn to: the difficulties which may arise when wooden panels are exposed only in duplicate; the necessity of using check tests with individual observers; the difficulties attending the use of more than one paint system on test panels; the desirability of obtaining complete meterological records at the exposure sites.

The gas checking of stoving finishes containing various alkyds. L. R. Rogers. *J. Oil and Colour Chemists' Assoc.* **36,** 95(1953). The gas checking of alkyd containing stoving finishes was investigated to determine the cause of the phenomenon. Tests in the presence of ozone disprove the theory that conjugated double bonds are necessary in the oil or alkyd before gas checking can occur. It is suggested that the only certain method of preventing stoving finishes from gas checking is to use alkyds modified with saturated fatty acids.

Micelle formation in alkyd resin solvent systems. C. M. Shaw and J. F. Johnson. *Official Digest Federation Paint and Varnish Production Clubs* **No. 339,** 216(1953). A study of an alkyd in solution in different hydrocarbon solvents was made. Three types of solvents were used—aromatics, naphthenes and paraffins. It was found that though at low concentrations (25% resin) there was little difference in the viscosities at high concentrations (60% resin) there were pronounced differences in viscosities in different solvents. The difference was attributed to micelle formation. In different solvents the molecular weight of the micelle differed. A light scattering method of studying the micelle molecular weight is described.

The oxidation of monoethanoid fatty acids and esters. Catalytic oxidation of elaidic acid, methyl elaidate, and n-propyl elaidate. The oxidation products. J. H. Skellon and M. N. Thruston. *J. Chem. Soc.* **1953,** 138. The oxidation of the acid and its esters was studied at 98°. The catalyst used was 0.05% uranium as the elaidate. Conclusions were that the oxidations are probably chain reactions initiated by ·OOH with direct attack at the double bond resulting in its migration to the adjacent position. The resulting hydroperoxide group is, therefore, alpha to the double bond.

Some paint-technical properties of the oil of Camelina sativa. H. W. Talen and Mrs. P. M. J. Jansen Verplanke-Kupers. *Verfkroniek* **25,** 331(1952). Oil of *Camelina sativa* by itself does not dry as well as linseed oil, but is very useful in modified alkyds. Stoved for one hour at 120° such alkyd resins yellowed less than similar linseed oil-alkyd resins. *Camelina sativa* is a native plant of Holland; its seeds grow in sandy ground in which linseed would not thrive. (*Chem. Abs.* **47,** 3581)

The influence of temperature on the polymerization of Chinese wood oil. J. van Loon. *Verfkroniek* **26,** 61-64(1953). The influence of temperature on the polymerization of Chinese wood oil particularly in connection with the percentage of polymeric acids formed during the process was investigated. It was concluded that the isomerization of the α into the β-elaeostearic is very important in connection with the gelation phenomenon. Below about 240°C. α-elaeostearic acid is only slowly isomerized into the β-acid; above this temperature the isomerization takes place instantly.

The effect of driers on the properties of alkyd resin finishes. *Paint Manuf.* **23,** 81(1953). The effect of various driers on turbidity of clear alkyd varnishes was studied. Lead driers frequently cause turbidity of varnishes on standing. This can frequently be corrected by the addition of calcium. In grinding pigments, particularly zinc oxide, into alkyds the drier should not be added before grinding because a large increase in viscosity frequently results on storage. Relative activity of driers are cobalt, manganese and lead in order of decreasing activity.

Evaluation of polyhydric alcohols, Part 1. *Paint, Oil Chem. Rev.* **116,** No. 7, 12(1953). Systematic tests for determining the value of a polyhydric alcohol as the base for the preparation of a drying oil are described. The following points are discussed: (1) characterization of the alcohol and (2) the preparation of reconstituted oils. The choice of standards, fatty acids used, esterification procedure, esterification kinetics and calculations required are discussed.

Evaluation of polyhydric alcohols, Part 2. *Paint, Oil and Chemical Review* **116,** No. 8, 24(1953). This concludes the review of methods of evaluation of polyhydric alcohols used for the preparation of drying oils.

Sinitiro Kawamura, Abstractor

Preparation of drying oil from semi-drying oil. II. Esters of unsaturated fatty acids with pentaerythritol. Teruzô Asahara, Chôichirô Hirai, and Yoshiharu Takahashi. *J. Oil Chemists' Soc., Japan* **1,** 175-8(1952). Esters with pentaerythritol were prepared from fatty acids of soybean, linseed, and calamory oils, and improved unsaturated acids from these oils by urea treatment. Esterification could be better effectuated without catalyst under CO_2 stream, at 240-250° for 3-4 hrs. Esters from fatty acids improved by the urea-adduct method were excellent as paint oils. The esters of soybean oil fatty acids with pentaerythritol were also satisfactory for paints.

PATENTS

Allyl alcohol-styrene copolymers. E. C. Shokal and P. A. Devlin. *U. S.2,630,430.* Styrene and allyl alcohol are charged to an autoclave in a weight ratio of 1 to 9. Polymerization is carried out for four hours at 125°C. with air as catalyst. The copolymer formed with about 25% conversion is about 38% styrene. When it is esterified with linseed fatty acids it gives a resin oil which dries lint-free at room temperature in six and one-quarter hours.

• Waxes

R. L. Broadhead, Abstractor

The refining of sugar-cane wax. B. K. Davison and L. F. Wiggins (Imperial Coll. Trop. Agr., Trinidad. *Intern. Sugar J.* **55,** 10-12(1953). Crude wax (400 parts) is melted with 40 parts bentonite and 10 parts active C. The required alcohol (4000-7000 parts) is added and the mixture refluxed one hour. The wax solution and suspended bentonite and C are decanted from the resin and filtered at 70°. The hard wax crystallizes from the cooled filtrate and soft fatty material is obtained by evaporating the solvent. Any lower hydroxylated solvent can be used. In the West Indies fusel oil has been found excellent for the process. (*Chem. Abs.* **47,** 3015)

Wax encyclopedia. Part II. Four rigid systems. L. Ivanovszky. *Seifen-Öle-Fette-Wachse* **79,** 39-41, 61-63, 87-88(1953). Rigid systems are defined as those waxes and wax mixtures which are free of solvents in contrast to the ''semi-solid'' systems such as oily petrolatums which contain large amounts of fluid. Crystal packing and intermolecular forces are considered with particular attention being given to hydrogen bonding among the various types of molecules making up a wax.

Montan wax. Its place and that of its derivatives in the floor-wax industry. Charles J. Marsel (New York Univ., New York, N. Y.). *Soap Sanit. Chemicals* **29,** No. 1, 120-1, 123, 125(1953). A review of the montan-wax industry in the United States and Germany. (*Chem. Abs.* **47,** 2956c)

Electrochemical refining of crude Montan wax. Stefan Rosinski and Antoni Swieca (Zaklad V Chem. Przerobki Glownego Inst. Gornictwa, Katowice, Poland). *Prace Badawcze Glownego Inst. Gornictwa (Katowice) Komun.* **No. 76,** 11 pp.(1950); cf. *C.A.* **45,** 6859d. Crude wax is anodically oxidized in a 1-liter lead Erlenmeyer flask which acts as the anode. The cathode is a lead ring suspended horizontally on a lead wire. The flask has an inlet for wax, a reflux condenser, and Hg-sealed stirrer. Heating is by a thermostatic oil bath. Example: To 800 cc. of a 4-5% solution of Cr_2O_3 in 40-46% H_2SO_4 heated up to 100-5° add a solution of 10-15 grams of crude wax in 100 cc. of gasoline (boiling at 105-20°), treat at a current density 1.5-4.5 amp./sq./dm., and at 3.4-4.2 volts for at least 6.5 hours. If the resins are removed by a solvent before the refining treat 3.5 hours. The yield is about 90%. The refined wax has greater acid, saponification, and esterification numbers than the crude. The yield is higher than with the $K_2Cr_2O_7$ method and the product is similar. (*Chem. Abs.* **47,** 2956)

Properties of lignites of the United States. W. A. Selvig (U. S. Bureau of Mines, Pittsburgh, Pa.). *Fuel* **32,** 28-35(1953). Two general types of lignites that occur in the U. S. are recognizable by physical appearance and petrographic components. The commonly occurring kind is designated as xyloid or ''woody'' type. The other is known as the attrital type. One variety of this latter type, designated as canneloid attrital lignite, is made up largely of cuticular matter, spores, pollen, resin, and waxes. This variety has been mined and processed to recover wax. Information on occurrence, chemical and physical properties, petrography and classification of the different American lignites was prepared for use by the Classification Working Party, Coal Committee, E.C.E., Geneva, in connection with work in standardizing an international system for classifying coals. (*Chem. Abs.* **47**, 2956b)

Hydroxy acids in beeswax. Yoshiyuki Toyama and Hiroshi Hirai (Nagoya Univ.). *J. Chem. Soc. Japan*, Ind. Chem. Sect. **54**, 293-4(1951); cf. *C.A.* **46**, 3776f. It has been found that the hydroxypalmitic acids present in Japanese beeswax (from *Apis indica*) as well as in the beeswax imported from the United States are the same. The structure is confirmed as 14-hydroxypalmitic acid. (*Chem. Abs.* **47**, 3010)

Investigations on the synthesis of glycerides. P. E. Verkade. *Chimie et Industrie* **69**, 239-251(1953). A review with 72 references of modern methods for the preparation of simple and mixed mono-, di-, and triglycerides of all possible types having an absolutely certain structure. In particular, the transposition of an acyl group from the β to the α position is described.

PATENTS

Bleachable transfer ink. Helen J. Steiner. *U. S. 2,589,306.* An ink composition for use on carbon paper, typewriter ribbons, etc., the imprint of which may be removed from paper by a chemical bleach, such as NaOCl, is formed by incorporating a bleachable coloring material in a wax or waxlike vehicle to which are added other substances. The colorant may be any substance which imparts the desired color to the composition and is bleachable. For the vehicle, carnauba, candelilla, montan, paraffin, microcrystalline waxes, and beeswax, also Carbowaxes, Vistanex, and natural or synthetic latex are mentioned. (*Chem. Abs.* **47**, 3003)

Carnauba wax substitute. N. V. de Bataafsche Petroleum Maatschappij. *B. P. 681,263.* See *U. S. 2,546,328.* (*Chem. Abs.* **45**, 7367b)

Refining of rice wax. Yoshiro Ishiwata. *Japan. 4533('51).* Crude rice wax (20.2 kg.) (acid number 8, saponification number 90) at 90-5° was treated with 10 kg. CrO_3 in 90-120 kg. 25-35% H_2SO_4 portionwise at 95-110° and stirred for three hours; the lower aqueous layer is removed and the wax washed with 50 kg. 1-5% H_2SO_4 at 100° and water to give a light-colored wax, melting at 80-2°, acid number 17, saponification number 90, and Iodine number 4. (*Chem. Abs.* **47**, 3012i)

Coating material for wooden ship bottom. Eitaro Takamatsu. *Japan. 4538('51).* The ship bottom is coated with a mixture of NaF 15, glutin 10, and water 75%, dried for 5-6 hours, and then coated with a mixture of coumarone resin 45, carnauba wax 5, 2-$HOC_{10}H_7$ 8, fish oil 10, and drying agent 2% and then dried for 24 hours. (*Chem. Abs.* **47**, 2912f).

Preparation of pure rice wax and dewaxed rice oil from rice polishings, crude rice oil, or crude rice wax. Kisaku Kitsuta. *Japan. 5339('51).* Rice polishings (900 kg.) containing 20% oil are extracted three times with C_6H_6 (2500 l., 1300 l., and 1300 l., respectively); the extract is concentrated to 780 l., let stand overnight at 16° to separate into 561 l. upper clear layer and 219 l. ppt., which is filtered, washed six times with 60 l. C_6H_6 each time, and the C_6H_6 removed to obtain 7.1 kg. pure rice wax; the upper clear layer and C_6H_6 washings of the wax are combined and the C_6H_6 is removed to obtain 166.9 kg. dewaxed oil; 250 g. crude rice oil in 1 liter C_6H_6 is let stand overnight, the precipitate filtered and washed with C_6H_6 to give 10 grams wax, melting at 80°, iodine number 8, and 240 grams dewaxed oil; 400 grams crude wax is extracted with 1200 ml. C_6H_6 to give 70 grams wax, melting at 80°, and 290 grams dewaxed oil. (*Chem. Abs.* **47**, 3013)

• Detergents

Lenore Petchaft, Abstractor

Electron microscopic studies of some paraffinic sodium soaps. Morton L. E. Chwalow (Temple Univ., Philadelphia, Penn.). *J. Phys. Chem.* **57**, 354-8(1953). Electron microscopic investigations of the crystalline structures formed by the paraffinic sodium soaps, from sodium butyrate through sodium stearate show these to consist, primarily, of ribbon-like fibers, which in the higher molecular weight soaps occasionally form closed rings. The maximum widths of these fibers decrease as the molecular weights of the soaps increase. As is known from previous diffraction studies, sodium soap molecules align themselves with the long axes of their hydrocarbon chains parallel and with their ionic ends adjacent to each other.

Modern detergency. F. Courtney Harwood (British Launderers Research Association, London, Eng.). *J. Textile Inst.* **44**, P 105-13(1953). The field of detergency is reviewed with attention to early washing techniques, detergency characteristics, properties of new synthetic detergents and their comparison with soap, and new developments including brighteners and soil suspending agents.

Synthetic surface-active agents in industry. Jean Henrion. *Industries chim. belge.* **17**, 265-8(1952). Uses in the textile, leather, cement, metal, and flotation industries are discussed. Removal of dusts from gases is improved by spraying water containing a wetting agent, less water being thus required. (*Chem. Abs.* **47**, 3583)

Physical-chemical aspects of wetting power. G. Knafo, G. Reutenauer, and L. Rosano. *Teintex* **17**, 187-97(1952). Measurements of surface tension and its variation with time, adhesion tension for paraffin wax, penetration of solution into wool felt, and wetting power have been made with solutions of eight commercial wetting agents at concentrations of 0.005-4.0 g./liter. Adhesion tension is defined as $\gamma \cos \theta$ (γ = surface tension: θ = angle of contact). Results suggest that, where wetting occurs without penetration, the adhesion tension is the important factor. Where penetration into material occurs, the concentration of the wetting agent is also important, and it seems that considerable inhibition takes place only when the concentration at which micelle formation occurs is exceeded.

Effect of carboxymethylcellulose (CMC) as detergent. Th. Madsen (Technol. Inst., Copenhagen). *Tidsskr. Textiltek.* **10**, 243-5 (1952). A washed cotton sample marked with aqueous 1% CMC solution, washed for 10 min. in running water, dried, soiled with a standard soil, and again washed in water retained markings brightly on a dark background. CMC markings stained with India ink appear to be a light color after washing 18 hrs. with soap-soda solution. This indicates CMC is adsorbed on cellulose fabrics. It is not adsorbed on wool, silk, or nylon. It is assumed that the CMC crystal structure is so similar to that of common cellulose that an adaptation to the crystal lattice of the fiber takes place. Cocoa or fatty substances used for soiling inhibit the affinity between the cellulose fiber and the C of CMC. This is explained on the basis of the types of charge carried by the soiling substances. The CMC settling on the cellulose reduces the adsorption of certain dirt particles, especially C, from the dirty liquor. Pretreatment of cellulose textiles with a relatively strong CMC solution to obtain complete adsorption is recommended. (*Chem. Abs.* **47**, 3585)

The physical action of surface-active agents in the mechanism of detergency. Henri L. Rosano and Marianne Weill. *Am. Dyestuff Reptr.* **42**, 227-9(1953). This study seems to indicate that with detergent solutions, the mechanical work of detergency reduces itself to a matter of emulsification facilitated by adsorption of the detergent. There is a limit to the physical action of the detergent, and a more-or-less strongly adhering film of soil, varying with the nature of the substrate, is left on the surface. This film can be removed only by chemical action of the detergent itself or of the mineral salts added to the detergent compound. Moreover, the direct observations show the importance of the electrical charge of the lipophillic ion in the phenomenon of soil redeposition. From this it can be understood why pure sodium lauryl sulfonate is not as good a detergent as the same compound with added mineral salts. These salts increase the speed of adsorption of the detergent and dispersion of calcium ions and also complete the actual detergent operation by chemically attacking the thin residual film of soil.

Sinitiro Kawamura, Abstractor

Testing of detergency. Tadashige Kodama and Kiichirô Murakami (Miike Gôsei Kôgyô K. K.). *J. Oil Chemists Soc., Japan* **2**, 27-34, 75-80, 74(1953). A review on the soil to be removed by detergents, mechanism of detergency, history of measurements of detergency, preparation of soiled cloth, testing apparatus for detergency, and the evaluation of the removal of soils, with 160 references.

PATENT

Wetting, foaming, and detergent agents from coconut and palm oils. Societe anon. d'innovations chimiques dite: Sinnova ou Sadic. *Fr. 874,464.* Coconut, palm, and similar oils are reduced to alcohols. These are fractionated to definite products which are sulfonated. The process permits the production of sulfonated or other type detergents for use alone, or mixed with other detergents.