Abstracts

Oils and Fats

Edited by
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Postwar prospects for drying oils. O. and G. Eisenschiml. *Chem. Industries 55,* 912-4 (1944).

Preparation and application of soluble oils. A. Treffler. *Chem. Industries 55,* 922-4 (1944).

The solvent extraction of soybean flakes. C. O. King *et al.* Trans Am. Inst. Chem. Engrs. *40,* 533-56 (1944).

Some characteristics of the liver and visceral oils of British Columbia flatfishes. B. H. Morton. *Prog. Repts. Pacific Coast Sta.,* No. 61, 6-7 (1944).

Flavor reversion in hydrogenated linseed oil. I. The production of linoleic acid from linolenic acid. H. W. Lemon. *Can. J. Res. 22F,* 191-8 (1944).

Fat acid formation during oil deposition in flaxseed. E. P. Painter. *Arch. Biochem. 5,* 337-48 (1944). Oil deposition was rapid each season and oil continued to form for about 5 days after the max. percentage of oil in the seed had been reached. In 1942 I no. increased rapidly from 135.4, 8 days after flowering, to a max. of 198.1, 27 days after flowering. In 1941 the I no. increased during the early stages of growth then dropped sharply long before all of the oil accumulated in the seed. Free fat acids and unsaponifiable matter decrease in percentage as the oil accumulates. Changes in the percentage of the fat acids in the oils from the 1941 samples were small and paralleled changes in the I no. In 1942 linolenic acid increased in percentage until the max. I no. was reached. The percentage of oleic acid dropped sharply in the early part of the growing period, then leveled off to a near constant value. Linoleic acid remained nearly constant until 14th day of growth, then decreased in percentage until about the 24th day. The percentage of satd. acids decreased throughout the period of oil formation in both 1941 and 1942. The results presented may be interpreted to indicate that unsatd. fat acids are formed by desatn., but it appears doubtful whether this is the only mechanism. It seems equally probable that unsatd. acids are preformed.

Mechanism of heat bodying linseed oil. H. E. Adams and P. O. Powers. *Ind. Eng. Chem. 36,* 1124-7 (1944). The data obtained are in substantial agreement with published results. Polymerization with the formation of a 6-membered ring between 2 fatty acid groups is clearly indicated. Three fatty acid groups may also combine, but no estimate of the extent of this reaction is possible at present. The formation of an intermediate compd. is indicated by the results. This compd. has a low I value, but apparently is not a true polymer. It may be an intrapolymer formed by combination of 2 fatty acid groups in the same glyceride. Whatever the structure of the intermediate compd. may be, it rearranges during later stages of heat bodying to form an interpolymer.

A detailed analysis of the back fat of the pig, with special reference to the C_{20-22} unsaturated acids. P. B. D. de la Mare and F. B. Shorland. *Analyst 69,* 337-9 (1944). The results are interpreted as indicating the presence in this fat of a trace of highly unsatd. C_{20-22} acids. The original total acids contained 0.04 mol. % of C_{20-22} highly unsatd. acids calcd. as arachidonic acid. The subject is under further examn. and these tentative conclusions are presented because of the report of the possible presence of an eicosenoic acid in human depot fat. It is interesting that in this fat also the isolated C_{20} fraction appeared to be a complex mixt. of acids. The discrepancies found by us and by other workers between the amt. of arachidonic acid calcd. from the wt. of isolated polybromides and the amt. of C_{20} acids calcd. from the esterfractionation data supports the contention that in pig back fat the C_{20} acids are not entirely "highly unsatd." It seems possible, therefore, that diethenoid C_{20} acids are more widely distributed in animal fats than has previously been suspected.

Further observations on the water and fat content of the skin and body of the albino rat on a high fat diet. W. Wynn and J. Haldi. *Am. J. Physiol. 142,* 508-11 (1944). A high fat diet induced a definite increase in the fat content and a decrease in the percentage of water and of protein in the skin and body of the albino rat within 1 week. These changes were qualitatively the same although quantitatively not as large as those previously observed at the end of 70 days on the diet. The same sex differences in the compn. of the skin were obtained on a high fat diet as on a stock and high carbohydrate diet. Drying of the animal tissues in an evacuated desiccator is a more reliable method of detg. the water and fat content than drying in an oven at 100-105°.

The chemical estimation of *a*-tocopherol and total tocopherol in mixtures of the *a*-, *b*-, and γ-forms. E. L. Hove and Z. Hove. *J. Biol. Chem. 156,* 601-10 (1944).

A method for estimating total fat-soluble antioxidants based on the relation between fat peroxides and carotene destruction. E. L. Hove and Z. Hove. *J. Biol. Chem. 156,* 611-21 (1944). *a*-, *b*-, and γ--tocopherols or mixts. of the 3 and gossypol were essentially equiv. in protecting carotene against preformed fat peroxides. Lecithin and cholesterol were without activity as antioxidants. A method was developed for estg. total fat-sol. antioxidants based upon the protection of carotene against preformed fat peroxides. This method was applied to vegetable salad oils, dry yeast and rat liver.

The effect of temperature on the relative antioxidant activity of *a*-, *b*-, and γ-tocopherols and of gossypol. E. L. Hove and Z. Hove. *J. Biol. Chem. 156,* 623-32 (1944). The relative antioxidant activity of *a*-, *b*-, and γ-tocopherols has been found to be dependent upon temp. At low temps. the 3 compds. showed approx. equal activity, while at elevated temps. the γ-tocopherol was several times more active than the *a* form. This held true both for the protection of carotene against preformed fat peroxides and for the inhibition of peroxide formation in aerated Et oleate. Gossypol was about equal to the tocopherols as an antioxidant at 35°. The dianilinogossypol was equal to the free gossypol on a mol. basis. A distinction is pointed out between antioxidant potency and activity. Evidence was obtained that at physiol. temps. *a*-tocopherol had the greatest antioxygenic potency, followed in order by *b*- and γ-tocopherols and gossypol.

GOSSYPOL AS A CAROTENE-PROTECTING ANTIOXIDANT, IN VIVO AND IN VITRO. E. L. Hove. *J. Biol. Chem. 156,* 633-52 (1944). Pure gossypol and dianilinogossypol were effective antioxidants at daily doses of 1 mg., for the preservation of carotene fed with lard or Me linolate to depleted rats. These compds. were only slightly inferior to α-tocopherol in this respect. Cottonseed oil meal was equal to wheat germ in stabilizing a carotene soln. in Et oleate, in vitro, and much superior in this respect to several other common feedstuffs. Defatted cotton seeds added to peanut oil meals at a 10% level extended the keeping quality of the meals by 4 to 5 times.

THE DEPOSITION OF ANTIOXIDANTS IN THE ABDOMINAL FAT DEPOTS. H. T. Hanson, R. H. Barnes, W. O. Lundberg, and G. O. Burr. *J. Biol. Chem. 156,* 673-7 (1944). This work confirms our earlier report in showing that the keeping time of the body fat from rats fed a vitamin E-deficient diet is very low, practically lacking an induction period. Addn. to the diet of 5 antioxidants other than tocopherols (ascorbic acid, hydroquinone, α-naphthol, nordihydroguaiaretic acid, lecithin) does not increase the stability of the fat. The α- and γ-isomers of tocopherol greatly prolong the keeping time of the rendered fat when fed to rats which were previously vitamin E-deficient. This evidence strongly suggests that only compds. having the properties of vitamin E are deposited in adipose tissue as effective antioxidants.

STUDIES WITH RADIOACTIVE PHOSPHORUS OF THE CHANGES IN THE ACID-SOLUBLE PHOSPHATES IN THE LIVER COINCIDENT TO ALTERATIONS IN CARBOHYDRATE METABOLISM. III. THE EFFECT OF FASTING AND OF HIGH FAT, HIGH CARBOHYDRATE AND HIGH PROTEIN DIETS. N. O. Kaplan and D. M. Greenberg. *J. Biol. Chem. 156,* 543-51 (1944). The total acid-sol. P^{31} content of the liver decreased in the fasted and the high fat- and high protein-fed animals. The total acid-sol. P^{31} is increased by a high carbohydrate intake. The total acid-sol. P^{32} content of the liver is increased on all but the high fat regimen. In the fasted, fat-fed and protein-fed rats a great deal of the P^{32} is present in the inorg. form. These animals show a decreased ability to fix inorg. phosphate. The high carbohydrate-fed animals show a decrease in the inorg. P^{32}. They convert a larger percentage of the labeled P into org. form than do the animals on any other regimen.

PATENTS

TREATING SOYBEAN OIL. P. Oertling (Glidden Co.). *U. S. 2,363,016.* The process comprises heating soybean oil with up to about 20% of uncombined polyhydric alc. contg. 3 or more (OH) groups in the presence of a small amt. of a mixt. of ZnO and $PbSO_4$.

STABILIZATION OF SHORTENING. J. L. Jakobsen (General Mills, Inc.). *U. S. 2,363,672.* A process of stabilizing shortening comprises adding a tocopherol-contg. deodorizer sludge to a shortening and hydrogenating the resultant mixt.

OIL SETTLING TANK. *R. T. Anderson* (V. D. Anderson Co.). *U. S. 2,365,442.* This device is an accessory for an expeller press; it comprises a long cooling tank from which oil and settle solid can be removed separately.

STABILIZING AGENTS. C. F. Prutton, A. K. Smith, and D. R. Frey (Lubri-Zol Corp.). *U. S. 2,365,291.* This antioxidant which is suitable for fat and petroleum products is produced by the reaction of PCl_3 with an org. ester of lactic acid.

BENEFICIATED MINERAL OILS. J. M. Musselman (Standard Oil Co.). *U. S. 2,365,209.* A lubricant comprises a mineral oil and Na lauryl sulphate and the reaction product of phosphorus pentasulphide on degras, sperm oil, beeswax or other ester wax.

MAGNETIC FIELD CONTROL OF HETEROGENEOUS CATALYSTS. O. F. Krumboltz. *U. S. 2,352,791.* In the catalytic hydrogenation of unsatd. materials the process of controlling the activity of the heterogeneous catalyst comprises applying to said catalyst a magnetic field having an effective strength below about 5 gauss and proportioned to modify the effective magnetic field of the earth and to achieve a predetd. enhancement of the activity of said catalyst.

PREPARATION OF HYDROGENATED GLYCERIDIC OIL. C. J. Borkowski and J. L. Schile (Best Foods, Inc.). *U. S. 2,365,045.* A method of hydrogenating comprises reducing a compd. of Ni to active Ni in a mixt. composed principally of a mineral oil vehicle and a smaller proportion of a fatty material adding the reduced active Ni to the oil to be hydrogenated and adding to the oil prior to hydrogenation a finely divided active C having an apparent sp. gr. of not more than .30, a pH of 6.6 to 7.4 and less than 40 p.p.m. of free S.

DISTILLATION OF FATTY ACIDS. J. F. Murphy (Lever Bros. Co.). *U. S. 2,361,411.* A method of prepg. a good grade of fatty acids for manufg. soap from fatty acid stock obtained by splitting low grade fatty materials comprises subjecting the fatty acid stock to fractionation at an elevated temp. and sub-atm. pressure to remove the lowest boiling components and thereafter without any intermediate heating of the remaining stock subject it to distn. at a lower temp. and pressure to remove the fatty acids from higher boiling components.

DISTILLATION DEVICE AND PROCESS. W. A. Darrah. *U. S. 2,362,889.* The process of accelerating mol. distn. is by causing a flow of mols. to be torn from the surface of the flowing electrode and travel under the acceleration of a direct current elec. field through an evacuated space from an area of smaller radius of curvature from a warm portion of liquid being distd. to an area of larger radius of curvature on a colder zone of distillate. Process is used for distn. of fats.

COMPOSITION OF MATTER. G. Allen (Petrolite Corp). *U. S. 2,363,034-5.* A compn. useful as a demulsifier for crude petroleum and a break producer in the doctor treatment of gasoline, consists of reaction product of ethanolamine and S-converted triricinolein produced at 150° to less than 190° from ratio of 100 parts ester, 10-17 parts S and 10-20 parts alkanolamine. Polycarboxylic acids are also used in the prepn. of these compns.

CERTAIN WATER-SOLUBLE HIGH MOLAL OXYALKYLATED ESTERS. M. De Groote and B. Keiser (Petrolite Corp.). *U. S. 2,363,045-8.* The neutral water-sol. esterification product is derived by reaction between 1 mole of a dibasic compd. and 2 moles of a high molal water-insol. fat alc.; the dibasic compd. being the esterification product of: (1) a polyethylene glycol having at least 7 and not more than 17 ether linkages; and (2) a dibasic carboxy acid having not more than 6 C atoms; and the ratio of the esterifying reactants being within the range of more than 1 and not over 2 moles of the dibasic acid for each mole of the glycol.

METHOD OF STABILIZING CARBONYL CONTAINING MOTOR FUELS. R. T. Bell (Pure Oil Co.). *U. S. 2,365,377.* A motor fuel comprises a major portion of hydrocarbons boiling within the gasoline boiling range, a minor but sufficient amt. of a metal carbonyl compd. to raise the antiknock rating of the motor fuel and a phosphatide in an amt. of at least approx. equal in wt. to the metal present as carbonyl compd.

NITRIC ACID OXIDATION OF FATTY MATERIALS. D. Price and R. Griffith (National Oil Products Co.). *U. S. 2,365,290.* Process for oxidizing fatty substances contg. unsatd. fatty residues to lower mono- and dibasic acids comprises treating said substances with nitric acid in the presence of Mn oxides and salts of Mn-contg. acid radicles.

LUBRICANTS. J. D. Morgan (Cities Service Oil Co.). *U. S. 2,362,767.* A lubricating grease comprises approx. 6% of a Li soap, approx. 1% of an Al soap, the remainder of the grease consisting essentially of dialkyl phthalate.

STABLE LUBRICATING COMPOSITION. A. J. Morway and J. C. Zimmer (Standard Oil Development Co.). *U. S. 2,363,013.* An improved stable grease compn. consists of a low viscosity, low pour mineral lubricating oil, 15.5% of a mixt. of Li and Al soaps, a slight excess of free higher fatty acid and as an oxidation inhibitor, 0.5% phenyl *a*-naphthylamine and 0.5% Zn naphthenate.

WAX EMULSIONS. J. O. Handy (Duzzel Corp.). *U. S. 2,364,632.* A coating compn. for fresh fruits and vegetables has approx. the following compn. alkali neutralized candelilla wax from 15% to 20%; paraffin from 1% to 3%; stearic and oleic soap from 2.5% to 7%.

COATED FLATTING AGENT AND PROCESS FOR MAKING THE SAME. L. Auer (Interchemical Corp.). *U. S. 2,364,611.* A new compn. of matter useful as a flatting agent which is substantially transparent in conventional lacquer and varnish films comprises pigment size particles of a soap of a metal of the class consisting of Al, Zn, Mg, and alk. earth metals and rosin which has been modified by chem. reaction to increase its m.p. while leaving its carboxyl group free to form soaps coated with a film deposited from an aq. soln. of casein.

EMULSION PAINT AND METHOD OF PRODUCING THE SAME. L. J. Howlett. *U. S. 2,362,635.* A paint compn. comprises an emulsion of a vegetable oil and water and contg. $MgCO_3$ dissolved therein in the ratio of about 1 part $MgCO_3$ to 35 parts water and a pigment, the amt. of water in the emulsion not exceeding the volumetric amt. of oil and in which the $MgCO_3$ acts as an emulsifying medium.

Abstracts

Soaps

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THE SPRAY DRYING OF SOAP POWDERS. Brian N. Reavell. *Soap, Perfumery & Cosmetics 17,* 816-8 (1944). Early methods of producing soap powders included casting hot mixture into frames and, after cooling, slabbing, cutting, and drying, they were ground or milled into powder. Powders of soap with a high fatty acid content could not be made in this manner. The new method consists of passing the molten soap mixture into an atomizer where the soap is atomized by centrifugal force into multitudinous small particles. These particles are projected into a stream of air which is blown into a drying chamber. Powders made in this way are characterized by their uniformity of particle size, absence of "fines" or dust, and rapid solubility. The powders may be in the form of hollow spherical particles which are very light in weight, and this method is equally applicable to soaps or synthetic detergents.

IMPROVED TOILET SOAP PRODUCTION. E. T. Webb. *Soap, Perfumery & Cosmetics 17,* 830-2 (1944). This article discusses the importance of temperature control in the manufacture of toilet soaps. The general appearance of soap, its bright and lustrous surface clearly marked can be improved or impaired by the temperature. The lasting properties of the bar, its resistance to a pappy consistency may be controlled by temperature conditions during the milling and plodding operations. The formation of "grit" which prevents a soap bar from having a smooth and velvety surface is caused by over-drying due to improper control of heat. Soap cracking, whether external or internal, may also be due to temperature influences during milling and plodding. The temperature of the machines, the room in which they work, and of the cooling water used on the mills and plodders; all these, separately and together, have a tremendous effect on both quality and output of toilet soaps.

SOAP FIGHTS INDUSTRIAL DERMATITIS. Georgia Leffingwell. *Am. Perfumer & Essential Oil Rev. 46,* No. 12, 67-9 (1944). Soap has several important roles in dermatitis prevention, but its most essential part is in helping to maintain extreme and basic cleanliness for all persons subject to irritation resulting from their work. Soap is also used in many protective creams used on the skin. Formulas are given. 25 references.

ANALYTICAL DISPERSION METHODS FOR THE PARTICLE-SIZE DETERMINATION OF MINERAL FILLERS. R. Schmucker. *Fette u. Seifen 50,* 265-73. Methods of detg. particle-size distribution in mineral fillers for soap by optical means, filtration, elutriation, sedimentation and settling are discussed. The Andreasen pipet method (settling) appears to be most satisfactory. App. and procedure are described in detail. (*Chem. Abs.*)

PRODUCTION OF RIF-STANDARD SOAP. B. Kinzl. *Seifensieder-Ztg. 70,* 69-71 (1943). Since soaps made from synthetic fatty acids are salted out only with difficulty, it is recommended that sapon. be carried out by the half-heat method and about 1% salt be added at the start to prevent clot formation and rising. Such soap is mixed in a second kettle with other soap. When only one kettle and open steam are used, special precautions must be taken. Other steps in soap manuf. are described. (*Chem. Abs.*)