ABSTRACTS

Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

Chem. Listy Vedu Prumysl **31,** 88-93, 114-20 (1937); *Chem. Zentr.* **108,** II, 313.—Premier jus contains a relatively large amt. of vitamins A and D. In winter the vitamin A content of premier jus is ⅓-½ as great as in winter butter and the vitamin D is ½. In summer premier jus is equivalent to butter in vitamin D and it is ⅓ less than butter in vitamin A. Lard is poor in vitamin A. The vitamin D value of lard is less than ⅓ that of tallow in winter and ⅖ in summer.

Assay procedure for vitamin K (anti-hemorrhagic vitamin). H. J. Almquist and E. L. R. Stokstad. *J. Nutr.* **14,** 235-240 (1937).—A rapid procedure for assay of vitamin K supplements is described. Determination of hemoglobin levels is unnecessary in such assay, since avitaminosis K is not a primary cause of anemia in chicks. Vitamin K is present in soybean oil.

Lecithinaemia following the administration of fat. G. Hevesy and E. Lundsgaard. *Nature* **140,** 275-6 (1937).—By feeding a dog with oil and with radioactive phosphorus and then determining the proportion of "labelled" phosphorus in the lecithin of the blood and of the intestine, the authors found that the additional lecithin found in the blood contains only a small amt. of the active phosphorus, and conclude that during the absorption of neutral fats lecithin is formed outside the intestinal tract.

PATENTS

Emulsifying agents, emulsion and process of manufacture. W. F. Schanzle and A. S. Richardson (to the Procter and Gamble Co.). U. S. 2,091,886-7. —Partially esterified polyhydric alcohols (mono- and di-glycerides) are used as emulsifying agents.

Process of purifying oil and vitamin fractions thereof. A. O. Tischer (to Eastman Kodak Co.). U. S. 2,090,738.—Free fatty acids and other impurities are removed from an oil by shaking it with furfural and then allowing it to separate in two layers; the bottom layer contains an emulsion of furfural, free fatty acids, amine bodies and other impurities.

Fat splitting. Rus. P. 48,962; *Chem. Zentr.* **108,** 316 (1937).—One half of the fat is split with acid; the other half with alkali; whereafter both split products are mixed for the separation of free fat acids and neutral glycerin water.

Hydrolysis of fats. Henkel & Cie. G.m.b.H. Fr. 808,069, Jan. 28, 1937.—Water is passed in uninterrupted circulation through a column of molten fat also in circulation, at a temp. sufficiently high and under sufficiently high pressure to liberate the fat acid and glycerol. The glycerol liberated is constantly washed by the flowing water and is evacuated as glycerol contg. water while the fat is evacuated at the other end. (*Chem. Abs.*)

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Soaps

Edited by M. L. SHEELY

Analysis of toilet soap. *Oil & Colour Trades J.* **92,** 692 (1937).—The method for detg. the free alkali in soaps mentioned in most standard methods is that of finding the total and combined alkalis. This, however, does not always give the correct result. Bauschinger (*Fette u. Seifen,* **1937,** 250), cites a case where a sample of soap was tested by an official method, and there was only a trace of free caustic alkali as detd. by the titration and $BaCl_2$ method. As none of the usual filling agents was present, it was assumed that the alkali present was either combined with fatty acids or present as carbonate. The soap was then treated with a known excess of H_2SO_4 and the total alkali estimated as usual. The soap, which contd. 86.32% of total fatty acids, had a total alkali content of 17.59% as Na_2CO_3. The alkali required to neutralize the fatty acids represented 16.95% as Na_2CO_3. Free alkali according to this was 0.64% as Na_2CO_3. Actually the soap contd. 0.5% of ZnO used as a clouding agent. This was insoluble in H_2O and yet by the above method it was returned as free alkali carbonate. Subsequent tests showed that ZnO increases the % of total alkali but hardly affects the detn. of the combined alkali. Another point is that results for the combined alkali may be affected by the volatilizing of low mol. wt. fatty acids, i.e., caprylic acid. In the test as described in the Wizeoff methods, the fatty acids are heated until clear. (Wizeoff, 1930, Section 496.) The decompn. of a toilet soap always requires at least half an hr. It is, therefore, necessary to use a reflux condenser which is washed down with ether after the acid splitting. In 1 expt. 0.671 gm. of caprylic acid was heated for half an hr. in a 250 c.c. flat-bottomed flask on a H_2O bath, and the loss was 15% although the water in the bath merely touched the base of the flask. Many toilet soaps contain some low mol. wt. fatty acids, and the point mentioned above is important.

Solid potash soaps. *Seifensieder-Ztg.* **64,** 409-10 (1937).—Solid potash soaps for use in the textile industries are intermediate between hard soda soaps and the ordinary soft potash soaps. As hitherto made they have suffered under the disadvantage of being extremely hygroscopic, and although several attempts have been made to overcome this defect by the incorporation in the soap of special materials, such as beeswax for example, these have not proved entirely satisfactory. It has now been found that by using a fat charge consisting for the most part of satd. fatty acids or hardened fat, together with a small addn. of a suitable solvent, a satisfactory hard potash soap can be obtained which is very useful in the textile industries. The following is a suggested fat charge: 30% coconut oil fatty acids, 20% peanut oil fatty acids, 50% tallow fatty acids; or the charge may contain from 25 to 50%

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hardened fatty acids. The added solvent, to the extent of 5%, may be 2% tetralin plus 3% methylhexalin (methyl cyclo-hexanol), or a mixture of 1% turkey red oil, 3% hexalin, and 1% carbon tetrachloride. Brief directions are given for boiling, including a note on the soda-potash soaps. (*Soap, Perfumery and Cosmetics.*)

Hydrogenated fish oils. Dr. J. A. Lovern. *Chemistry and Industry* **56,** 75 (1937).—Hydrogenated oils are widely used in the manufacture of soaps. Untreated fish oils could not be used because on saponification they would darken considerably. This darkening is probably due in some measure to the presence of traces of aldehydes and ketones in highly unsaturated fats. These substances, produced by slight oxidation of the unsaturated acids, will condense to dark-colored resins on saponifying. With the partially hydrogenated oil, of a very much more saturated nature, there is no darkening on saponification. It is necessary to control the degree of hydrogenation since if much saturated acid—particularly any arachidic or behemic acid—was produced the soap would be largely of an almost insoluble nature. This control is facilitated by the selective nature of the hydrogenation reaction, monoethylenic acids only becoming saturated in appreciable amounts when all the polyethylenic acids (the dangerous ones as regards darkening) have been reduced to the monoethylenic stage.

Detergent, emulsifying, finishing and wetting agents. A communication to the A.A.T.C.C. *Amer. Dyestuff Reporter* **26,** 569-580 (1937).—Data on composition, properties and uses—particularly on the newer materials in these overlapping fields. Subjects discussed are colloidal electrolytes, special sulfonated oils, special properties of sulfonated oils, miscellaneous sulfonated products, the nekal type, aromatic sulfonic acids and their salts, sulfated aliphatic alcohols, the higher alcohols, fatty acid condensation products, protein-fatty acid products, cationic surface active materials, kinds of cation active assistants and their uses, active anions and cations in one molecule, other basic assistants, unclassified products, general properties.

Fatty acid shaving soap. *Seifensieder-Ztg.* **64,** 515 (1937).—The mildness and lather stability of shaving soap depends on the choice of fats and oils used. A good shaving soap can be made from the following fatty acids: 25-30% coconut oil fatty acids, 75-70% tallow fatty acids. Half of the latter may be replaced by bleached palm oil fatty acids, bone fat fatty acids, or hardened fat fatty acids. Saponification is carried out at 90° C. (104° F.) with an alkali mixture containing 50% caustic soda and 30% caustic potash which has been heated to the same temperature. The alkali is added slowly with stirring, in an amount dependent on the saponification number of the fatty acid mixture. Finally 0.2% concentrated solution of sodium thiosulfate is added. (*Soap.*)

Soap flakes. H. Gabler. *Seifen.-Ztg.* **64,** 628-9 (1937).—Brief descriptions of some app. for production of soap flakes. Some new machines yield flakes of definite form, i.e., square, triangular, rhombus, etc., contg. designs or other printed matter on them. Applying heat during milling yields transparent flakes; however, this removes some of the perfumes when milling perfumed soap.

Acid resistant metals in soap industry. *Oil & Colour Trades J.* **92,** 691 (1937).—According to Hougardy (*Fette u. Seifen,* **1937,** 230), with acid resistant steel fat splitting can be done at 225-230° C. at a pressure of 25 atm. 2.5 tons of fat can be split in three hours in a suitable steel autoclave without the use of any catalyst. This results in greater output per plant unit, increase of the free fatty acid content and economy in chemicals. Resistant steel will actually permit of higher temperatures, but as fat commences to undergo cracking at 300° C. these are naturally not desirable. A heat insulated autoclave to take a charge of 5 tons of fat will measure 1.25 m. dia. and 8 m. in height. It is provided with a stirrer which is also made from resistant steel and is designed to give extremely efficient mixing of the oil and water so that the steam will not cause decomposition. This steel is also used for making distillation plants. The plants can be designed for distilling fatty acids and for distilling off free fatty acids from glycerides. Copper has only two-thirds the resistance at 250° C. that it has at room temperatures, and the steels do not alter much in this respect with this difference in temperature.

There are two main groups of steel used for resistance purposes. The first, martensitic steel, contains from about 14% chromium to 17-18% chromium. Sometimes 1.2-2% molybdenum is also alloyed with the steel. The second type is austenitic, two examples being 18/8 chromium/nickel steel and more recently chromium/managanese steel. This last is very malleable but not so resistant as the others mentioned.

The hydrolysis of sodium soaps in aqueous solution. B. Lustig and F. Schmerda. *Fette u. Seifen* **44,** 51-4 (1937).—Soap solns. contg. 0.1% of various pure fat acids or certain combinations thereof were prepd. by exactly neutralizing a weighed amt. of fat acid (or acids) with the calcd. amt. of NaOH. The solns. were then heated briefly on a boiling water bath, kept for 48 hrs. at 20-22° and filtered. After the *p*H of the filtrate was detd., it was acidified with HCl and the liberated fat acid (or acids) and the NaCl were detd. gravimetrically. Tabulated data support the following conclusions. The degree of hydrolysis of the soaps increased on passing from the lower to the higher satd. acids, e.g., Na laurate 4.8, Na myristate 44.8 and Na stearate 92.1%. The hydrolysis of Na oleate (36.6%) was much greater than that of soaps from the other unsatd. acids tested (Na ricinoleate 0.1, Na linoleate 1.7, Na stearolate 0.3%). On addn. of either unsatd. (e.g., linoleic, oleic) or lower satd. (e.g., lauric) acid to the stearic acid used in making the soap soln., increased amts. of stearic and decreased amts. of other fat acid were found in the filtered soap soln. Expts. with solns. contg. up to 2% stearic acid as its

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Na soap showed that the amt. of fat acid in the filtrate increased much more rapidly than the amt. of NaOH. The presence of soap decreases the dissocn. of NaOH in dil. soln. (*Chem. Abs.*)

The solubility of sodium soaps. B. Lustig and F. Schmerda. *Dermatol. Wochschr.* **104**, 607-13 (1937). —The Na salts of palmitic and stearic acid are highly hydrolyzed and the solns. react strongly alk. to phenolphthalein. Increase of concn. reduces the hydrolysis. Satd. acids of lower mol. wt. and unsatd. acids give less hydrolysis. The addn. of unsatd. acids to stearic acid causes a decrease of the soly. of the unsatd. acid and an increase of the satd. in the soln. (*Chem. Abs.*)

PATENTS

De-oiling neutralized soap stock. Aktiebolaget Separator, a Swedish company, of Stockholm. British Patent 469,204 (July 21, 1937).—The present invention consists of de-oiling a soap stock, the aqueous phase of which has a density of about 18 to 25 degrees Be. by continuously passing the undiluted soap stock through a centrifugal separator, operating at high speed and continuously discharging the de-oiled soap stock and the recovered neutral oil into different vessels.

In this way the de-oiling is more complete than the one effected by discontinuous centrifugation of the soap stock in a separator with large diameter, and less complete than the one obtainable by dilution and continuous centrifugal treatment in a separator working at high speed. But, on the other hand, the method is a continuous one, the installation costs are smaller than those of the two methods described in the foregoing, and the costs for diluting the mass, for salt, heating and work are also less.

The continuous discharge of the thick and efficiently de-oiled soap stock from the rotor of the centrifuge in a suitable receiving vessel makes it desirable to provide special arrangements for rendering the soap stock easily mobile.

In the construction illustrated in the specification the receiving vessel for the soap stock is of a normal form used in centrifugal separators designed for the treatment of liquids, but provided with one or more injection tubes for water; these tubes are integral with the fixed part of the centrifuge and sprinkle water over the bowl. The quantity of water can be regulated at will. The injection tube or tubes are preferably arranged in such a manner that the jet or jets of water issuing therefrom hit the wall of the bowl at the height of the discharge shoulders for the de-oiled soap stock. The water, which is atomized by the movement of the bowl, encloses the soap globules, dilutes the peripheral mass of the globules, and thereby prevents the soap stock from sticking to the receiving vessel. (*The Perfumery and Essential Oil Record* **28**, 308, 1937.)

Soap and glycerol production. Henry W. F. Lorenz (40% to Charles H. Wilson). U. S. 2,084,446, June 22.—A mixt. of fat and a base such as caustic alkali is heated to a temp. in excess of the m. p. of the resulting anhyd. soap and the mixt. is thoroughly agitated in an air-free gas or vacuum while the mixt. is intimately brought into contact with a stream of water vapor. (*Chem. Abs.*)

Naphtha-soluble soap composition suitable for use in "dry cleaning." Theodore R. Donlan (to Standard Oil Development Co.). U. S. 2,084,483, June 22.—K oleate constitutes about 10-30% of the compn. and is used with about an equal amount of water and an oil-sol. alkali metal sulfonate derived from a fuming sulfuric acid treated lubricating fraction of a petroleum oil in an amt. of 7% or more, and with a major proportion of a heavy hydrocarbon oil. (*Chem. Abs.*)

Detergent (alkali soap). Alexander C. Brown (to Emery Industries, Inc.). U. S. 2,085,691, June 29.—A mixt. formed from Na_2CO_3 and liquefied fatty acids in the absence of any substantial quantity of water is atomized by means of steam, the proportions of the mixed materials and steam being such that the fatty acids are sapond. by the Na_2CO_3 while in the atomized condition and hard particles are formed which are not tacky (the amt. of steam used being less than would be required to dissolve the Na_2CO_3). App. is described. (*Chem. Abs.*)

Liquid potassium soaps. Fritz Draisbach (to Hall Laboratories, Inc.). U. S. 2,081,617, May 25.—K and Na metaphosphates in the relative mol. proportions of about 3:2, resp., are added to liquid K soaps, and serve conjointly to give good soly. in water. (*Chem. Abs.*)

Device for processing soap. K. Bolsoe and H. Stone. U. S. Pat. 2,092,047.—App. and a means of providing a cake of soap having completely sealed therein a card contg. advertising or other printing matter.

Detergent composition. R. A. Duncan and W. H. McAllister (to the Procter and Gamble Co.). U. S. Pat. 2,091,704.—The detergent suitable for use on the human skin comprises essentially glyceryl ammonium salts of alkyl sulfuric acids having 10 to 18 C-atoms per mol.

Wetting, Sudsing, Emulsifying and Detergent Agents Suitable for Laundry Use. U. S. 2,075,914, April 6, 1937. Arnon O. Snoddy and Wilfred S. Martin (to Procter & Gamble Co.). Alcs. from sperm oil or other unsatd. aliphatic alc. contg. 12-22 C atoms per mol. is caused to react with a reaction product of SO_3 on a metal chloride such as NaCl or a reaction product of chlorosulfonic acid on a chloride or sulfate (the metal of the reacting salt being one which forms a water-sol. product with the sulfuric ester of the alc.). U. S. 2,075,915 relates to similar reaction products derived from alcs. from coconut oil or other aliphatic alcs. contg. 10-22 C atoms per mol. (*Chem. Abs.*)

Cotton Research Foundation

(Condensed from "The Commercial Appeal," Memphis)

Dr. R. F. Nickerson, Dr. H. S. Olcott, and Dr. D. M. Musser, Fellows of the Cotton Research Foundation of Mellon Institute at Pittsburgh, are making a trip through cotton growing territory. The object of this trip is a survey of the cotton industry which, it was expected, would give them a background for their research on new uses for cotton.

The Fellows are visiting industrial laboratories, oil mills, compresses and finishing plants in the South and Mid-South.

The Cotton Research Foundation was established by Memphis and Mid-South cotton and business men and plantation interests for research into fields of suggested uses for cotton. The Fellows have already completed a preliminary study of cotton literature which revealed seven hundred (700) potential sources of cotton consumption.

The data gathered on their trip will be classified and assembled when they return to their duties at Mellon Institute. The practical work on their program will begin when they return to Pittsburgh.

Dr. Olcott made the following statement with regard to the program:

"Immediate results from this visit and our early researches are, of course, impossible. The study and search for new uses must necessarily include steps of trial and error. However, we are enthusiastic at the opportunity given by the Foundation for scientific exploration into the field of cotton uses. It is a vast field in its boundaries and rich in possibilities, almost a virgin soil to be cultivated and promising fruitful returns to the South through its important crops of cotton."

Announces Appointments

The following are now representing the Glyco Products Co., Inc., 148 Lafayette St., New York, N. Y., in their respective countries:

Siber Hegner & Co., Inc., Central P. O. Box No. 19, Osaka, Japan.

Marcel Quarre et Cie, 94 Rue Lafayette, Paris X(e), France.

E. Landerholm, Box 2152, Stockholm 2, Sweden.

Exclusivas Benet, S A, Apartado Postal 7538, Mexico, D. F., Mexico.

Pelegrina & Llorens, Salvador Brau 70, Apartado Postal 1558, San Juan, P. R.

Soap Fat Supplies Expected More Plentiful

A more plentiful supply of fats and oils used in the manufacture of soap has been reported by the Bureau of Agricultural Economics in its August "Fats and Oils Situation."

Increased production of major soap fats during the first half of this year compared with last was reported. And for the remainder of this year "plentiful supplies of all domestic vegetable oils" were forecast.

Reporting the availability of soap making materials, the Bureau said that the "production of tallow is expected to be lower during the last half of 1937 than it was in the same period of 1936. . . . Reports from the Philippines indicate expected increased supplies of copra during the remainder of 1937. . . .

"Prospective large cotton, corn and soybean crops will have direct and indirect effect on the total supply of soap materials. . . . Imports of palm oil in the first half (of this year) exceeded imports in the first 6 months of 1936 by more than 6 per cent. . . .

"Oil equivalent of imported babassu nuts amounted to about 35 million pounds in 1936. During the first half of 1937 oil equivalent of imports amounted to almost 27 million pounds. . . . Domestic production of fish oils has increased steadily in the past 6 years, from 64 million pounds in 1931 to 267 million in 1936."

The Bureau's situation report this month deals exclusively with soap fats and oils.

Cottonseed Oil Leads in Margarine Production

For the year ending June 30, 1937, cottonseed oil led all other fats and oils as an ingredient of margarine. This is the first time on record that cottonseed oil has taken first place in margarine production and is the first time since 1919 that coconut oil has not held the lead. The year's consumption of cottonseed oil by the margarine industry totaled 137 million pounds, or 43 per cent of all oils so used, as compared with 93 million pounds, or 31 per cent, in the year ending June 30, 1936.

The substantial increase in cottonseed oil raised the proportion of domestic oils used in margarine to 60 per cent. This compares with 41 per cent the previous year and is the first time since 1925 that American-produced oils have exceeded imported oils in this important food product. Corn oil, soybean oil and beef fats are other domestic oils which entered margarine in larger quantities during the past year.