ABSTRACTS

Oils and Fats

Edited by
W. F. BOLLENS and M. M. PISKUR

100% means the amt. used to neutralize the total free fat acid in the oil. Part of the oils were then polymerized and another fraction was treated with acid clay before polymerization. The acid value decreases as polymerization proceeds and the degree of the decrease is larger when the original acid value is large. The effect of acid-clay refining is negligible. The I no. also decreases with polymerization but the effect of both alkali- and acid-clay refining is negligible. **II. Changes of the specific gravity and the specific viscosity.** *Ibid.* 51.—The effect of refining upon the sp. gr. in polymerization is very small. The sp. viscosity is increased by polymerization and it is very high when there are both free fat acid and alkali soap. **III. Changes of the color and the index of refraction.** *Ibid.* 51-2.—In general, the color is decreased by both alkali- and acid-clay refining. With polymerization, the color of the imperfectly refined oil increases, while that of the fully refined oil decreases. The n^{20}/D was increased by alkali refining but not by acid-clay refining. Polymerization increased it considerably, and the imperfectly refined polymerized oil showed a greater index than the fully refined oil.

K. K.

The alcohol-extraction process for fatty oils. III. Extraction of cottonseed oil. M. Satô, T. Inaba and K. Kitagawa. *J. Soc. Chem. Ind., Japan* 38, Suppl. binding 50 (1935); cf. *C. A.* 29, 1272^9.—In extn. at higher temps. the ratio of extd. oil to total ext. increases with decreasing alc. concn. Extn. should be carried out at about 78° with an alc. concn. of 85% by wt. The oil from the lower layer (extd. oil) is much lighter in color and far superior in free fat acid content to the benzine- (gasoline-) extd. oil. The N_2 content of the extd. oil reaches 8.2-8.5%.

KARL KAMMERMEYER.

PATENTS

Fatty glycerides. The Procter & Gamble Co. Brit. 421,063, Dec. 13, 1934. Mono- and di-glycerides are prepd. by the reaction of a triglyceride with glycerol (I) at 140-205° in the presence of an alcoholate of an alkali metal, *e.g.,* Na glyceroxide, K. alcoholates and alcoholates prepd. from EtOH. In examples, Na is dissolved in I and the soln. treated with hydrogenated cottonseed oil. The products may be used as emulsifying agents for mixts. of fatty or mineral oils with H_2O in the production, *e.g.,* of cosmetics. In 421,284, Dec. 13, 1934, fatty esters contg. unesterified OH groups are prepd. by the reaction of a triglyceride of a fat or fatty oil with a polyhydric alc. in the presence of an alk. catalyst while removing H_2O vapor from the reactive medium by means of a stream of inert gas or by vacuum distn. Suitable catalysts include soaps, alcoholates and alk. materials which react with fatty acids to form soap. Among examples, (1) coconut oil is caused to react with I in the presence of soap flakes, N being passed through the mixt., and (2) hydrogenated cottonseed oil is caused to react with ethylene glycol in a similar manner. The products have similar uses to those of 421,063.

Preserving fats, fatty oils, fatty esters, fat acid salts, soap stock and soap. Wm. S. Calcott, Wm. A. Douglass and Herbert W. Walker (to E. I. du Pont de Nemours & Co.). U. S. 1,993,771, March 12. *p,p'*-Dihydroxybiphenyl (suitably in a proportion of about 0.001-1.0%) is used as an oxidation inhibitor. Cf. *C. A.* 29, 1672^1.

Mineral oil soluble castor oil. I. Davidsohn and R. Strauss. Ger. 608,973. Cl 23c Gr 2. Feb. 5, 1935. Castor oil is made sol, in mineral oil by addn. of chlorinated paraffin or other chlorinated, high, mol. wt., aliphatic hydrocarbons and followed by heating to about 200°.

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Soaps

***Edited by* M. L. SHEELY**

Textile Detergents. *Soap Perfumery and Cosmetics Trade Review,* 8, 5, 36 (May, 1935). Literature on the newer detergents increases. In Seifens, Zeit, 1935, 62, 135-8, a reprint is given of a paper read by Munch at the annual meeting of the German Chemical Society last year, on the fatty alcohol sulphonates, and fatty acid condensation products. This paper, already published in *Melliands Textilber,* 1934, (December) attempted to show the great superiority of the fatty acid condensation products over the sulphonates in respect to stability and especially colloid protective action. This view was strongly contested by K. Lindner, among others, and led to a lengthy polemic in the columns of *Melliands Textilber* (1934, pp. 417-18, 557, 558-61). Both groups are now being manufactured under various trade names (Igepons, Neopols, etc.) of widely differing properties, as is fairly well known by now; and each type would seem to have its own special sphere of application and usefulness. If the claims are not too widely drawn, each type has its advantages if properly used under the right conditions. In his articles on the fatty alcohol sulphonates (*Der*

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chem.-tech. Fabrikant, 1935, Nos. 9 and 10) Dr. E. H. Kadmer distinguishes between the sulphonation of the saturated fatty alcohols, and that of the unsaturated fatty alcohols, but he is mainly concerned with the sulphonation of fatty oils, such as castor oil in the production of Turkey red oil, and other similar products. German patent 609,456, by Oranienburger Chem. Fab. recently issued. Kadmer's paper is criticized by Welwart in *Seifens. Zeit.* 1935, 62, 242.

Dispersing and Regenreating Agents for Lime Soaps. Ralph Hart, *American Silk Rayon Journal,* 54, 40-2, 59, 60-1, March, 1935. A method is described for testing soap and similar materials for lime-proofness, also a method for evaluating the various commercial products recommended for dispersing or regenerating lime soaps. Results are given of tests, according to these methods of several processing agents for wet treatment of textiles. Tables show the effect of depth, dilution and temperature on lime-proof test, the effect of $CaCl_2$ on processing agents, the effect of Calgon concentration in regenerating Ca soap between 60° and 100°, and the $CaCl_2$ tolerance (limit of Ca-soap solubility) of various commercial inhibitors. Pyrophosphate acts like the metaphosphate but to a different degree. It is less effective with lime soap but superior in dissolving Mg soap. C. A. 29, 10, 3543, May 20, 1935.)

Selective Adsorption from Soap Solutions. *Technical News Bulletin,* Number 218, page 64, June, 1935. National Bureau of Standards, U. S. Department of Commerce. The existence of an acid soap resulting from the hydrolysis of soap in dilute aqueous solution has been suggested by different investigators. There is considerable evidence to show that the principal surface-active constituent of a soap solution, to which is attributed its efficiency as a lubricant, detergent, and emulsifying agent is the acid soap. This view is consistent with the fact that the addition of alkali to a neutral soap solution raises the surface tension and decreases the effectiveness of the soap in the processes mentioned, while the addition of fatty acid often improves the emulsifying and lubricating ability of the soap solution.

If the acid soap is the surface-active agent in the solution, it will concentrate at the interfaces and the aqueous medium will become more alkaline, unless the material forming the interface with the soap solution is acidic in nature or strongly adsorbs hydroxyl ions.

It was the purpose of a research described in RP801 in the June number of the *Journal of Research,* to study the selective adsorption at various types of interfaces formed by soap solutions in contact with different materials.

Soap is adsorbed from aqueous solution at all types of interfaces, but the ratio of fatty acid to alkali in the adsorbed portion varies with the nature of the interface.

Soap foam, continuously removed from an aqueous solution by CO_2—free air, was found to be less alkaline than the original solution, while the latter became progressively more alkaline. The addition of alkalies to the soap solution decreased the selective effect and modified the character of the foam.

When carbon black, paraffin oil and pure olive oil were brought in contact with soap solutions, the aqueous medium became more alkaline and acid soap was adsorbed at the interface.

Rancidity. *Perfumery and Essential Oil Record,* 26, 5, 198, May, 1935. The development of rancidity in soap was formerly attributed chiefly to the presence of unsaponified fat in the soap, resulting from an imperfect process of saponification. It has now become recognized, however, that even a completely saponified soap may turn rancid under certain conditions, and though, no doubt, the presence of free unsaponified fat does render a soap more liable to rancidity, other contributory causes may be the use of a fat charge in which some of the fat is already rancid, exposure of the soap to air and light, and the presence in the soap of even minute amounts of copper or iron, derived from the apparatus in which the soap has been made, such metal acting as a catalyst.

Any test, therefore, which assissts the soapmaker to detect rancidity both in the raw materials and in the fatty acids separated from a soap, will be of interest to him. One of the best known tests for rancidity is that of Kreis, and a modification of this was proposed in a paper read by M. A. Pyke before the last meeting of the Society of Public Analysts. In this new test, a solution of phloroglucinol in acetone is added to the oil or fatty acids, followed by a few drops of concentrated sulphuric acid, and the red color produced compared by means of the tintometer with the colors produced by standard amounts of epihydrinaldehyde, the substance which was shown a few years ago to be responsible for the color produced in the Kreis test by rancid oils.

Unfortunately the test is specific for epihydrinaldehyde, and as has been pointed out by several investigators, there are various types of rancidity, some of which do not give any reaction at all in the Kreis test, so that the absence of any red coloration is not necessarily a proof of the absence of rancidity. Tests on various oils and fatty acids from soaps have demonstrated, however, that the test is a useful one.

Stearin Pitches, Fatty Pitches and Fat Tars. *Seifensieder-Ztg.,* 62, 161-3, 195-6 (1935). The distillation of fat acids yields still residues whose properties depend both on the materials subjected to distillation and the distillation process itself. With increasing severity of distillation conditions both the decomposition of fatty materials and the formation of asphalt increase with the result that the resulting still residues tend to assume, to an increasing extent, the character of hard pitches. Thus on passing from fat tars to soft

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pitches and then to hard pitches, analytical data show that the saponification number (either in alcohol—Et_2O or alcohol-benzene) decreases, the acid number varies irregularly, the specific gravity increases somewhat as a rule, while the increasing asphalt content is the best criterion for differentiating between the various types of products. Asphalt was determined by extracting a 5-g. sample mixed with sand first with EtOAc and then with benzene and finally weighing the material insoluble in EtOAc but soluble in benzene. (C. A. 29, 10, 3540, May 20, 1935.)

Glycerine and Lanolin in Soap Preparations. *Oil and Colour Trades Journal,* 87, 1909, 1465, May 17, 1935. Liquid soaps and shampoos may contain up to 15 per cent glycerine, as it prevents undue frothing in the containers. In excess, however, it is apt to set up skin irritation, says T. Ruemele (*Oel u. Fett Ztg.,* 1935, p. 101). Before the addition of glycerine, the soap should be diluted with water. In shaving soaps about 2-3 per cent glycerine will prevent efflorescence, and prevents the lather from drying out. When added to transparent soaps, the glycerine should be free from lime salts. Lanolin is used as a superfatting material, and as little as 2-3 per cent distinctly improves soaps especially with regard to skin protection. Even up to 5 per cent does not affect odor, which, in any case can be masked, but stabilizes the lather. Soap superfatted with lanolin is recommended for certain skin troubles such as eczema. An interest-modification is known as lecithin-lanolin in which the natural oil of industrial lecithin is replaced by lanolin. This combination gives increased lathering power, while in cosmetics it is useful as some of the lecithin is adsorbed by the cleaned skin. Three per cent of lecithin-lanolin (representing 1.2 per cent lanolin) is used.

Triethanolamine soaps are very good emulsifiers. For emulsifying 100 parts of lanolin 5 parts of triethanolamine, 15 parts of stearic acid and 200 parts of water are required. Non-lathering shaving creams may be prepared in this way. The penetrating odor of lanolin is particularly noticeable in hot climates, and therefore products for export to the tropics should be efficiently perfumed.

New Detergent and Finishing Agents. R. J. Hannay, *J. Soc. Dyers Colourists,* 50, 273-82 (1934). A lecture. The requirements for textile finishes and the properties of the new types of assistants (sulfonated alcohols, etc.) are discussed in comparison with soap, and in relation to the selection of the most suitable agent in a given case. When used in hard H_2O in conjunction with soap for scouring, sulfonated alcohols only emulsify the Ca soaps, but do not prevent their formation. Hard waters reduce the efficiency of the new agents, but to an extent less than is the case with soap. A scheme of analysis of the new agents is described. (C. A. 29, 7, 3070, May 10, 1935.)

The Methods of Determining of "Free Alkalies" and the Determination of the Hydrolytically Dissociated Alkali in Soaps. I. Davidsohn, *Rayon and Melliand Textile Monthly,* 16, 23-4, 83-4, (1935) of C. A. 29, 369. The methods in use for determining free alkali are reviewed. The replacement or supplementing of requirements for minimum free alkali content of soaps by a requirement fixing the minimum OH-ion concentration is suggested, but is considered impractical until simple inexpensive apparatus can be devised for pH determinations. (C. A. 29, 9, 3186, May 10, 1935.)

Recovery of Glycerine from Fat Splitting. R. B. Dutt, *Indian Soap Journal,* 1, 163-4 (1935). Glycerine obtained from fat splitting is recovered by treatment with barium carbonate to neutralize sulfuric acid, with aluminum sulfate to remove albuminous matter, with barium hydroxide to precipitate the lower fatty acids, and with ammonium sulfate to reduce the ash content. The loss of glycerine in evaporation in open vessels may be 25 per cent, but by evaporating in vacuo, this loss is 2 per cent or less. (Soap, XI, 5, 69, May, 1935.)

Properties of (Commercial) Solid Soaps. J. L. Bowen and R. Thomas, *Trans. Faraday Soc.,* 31, 164-82 (1935). Two genuine household soaps were allowed to contract by (a) slow cooling, (b) rapid cooling, from 75° to 25°. The differences in the amounts of contraction were not significant. A machine was developed which registers the resistance in lb. offered to a cutting wire by a bar of soap. The hardness of the soap was determined by the titer of the fat acids in the mixed fat charges. Na chloride, carbonate or sulfate was added to a genuine 63% T. F. M. household soap. With increasing concentrations of all 3 salts the hardness of the soap falls to a minimum and thereafter increases. The ratio concentration of added anhydride salt at minimum hardness/molecular weight is roughly the same for all the salts, viz., Na thiosulfate, trisodium phosphate, borax, Na chloride, carbonate and sulfate. Photomicrographs of soap containing 0.5, 1.0, 1.5 and 2.0% Na carbonate are shown. The migration of Na chloride, carbonate and silicate in soap was studied. (C. A. 29, 7, 3186, May 10, 1935.)

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PATENTS

A New Process for the Manufacture of Soap. *The Industrial Chemist,* Vol. XI, No. 124, page 181, May, 1935. British Patent 367,513 provides for the manufacture of soap by a continuous process. An experimental plant was set up and saponification brought about in a tube of $\frac{1}{8}$ inch bore. By keeping the reaction time very short (about 30 seconds), and working at a high pressure (800 to 1500 lbs. per square inch) the soap formed was found to be very stable.

In a typical experiment two kilograms of cottonseed oil were mixed with 800 grams of caustic solution and the whole was saponified by pumping through the heating coil. The time of transit was about 30 seconds. The heating coil was immersed in an oil bath at about 300° C.

The continuous feature of the process is provided by running known weights of oil and caustic soda solution into a jacketed mixing pan kept at a suitable temperature by means of hot water in the jacket. The mixture is then pumped by means of a three-throw plunger pump through the heated saponifier coil. The second jacketed mixer is then filled up with oil and caustic soda solution to be ready to be pumped through the saponifier coil, as soon as the first mixer is empty. This cycle is repeated. The soap is sprayed into a butter-muslin covered horizontal chamber on to a band conveyor, discharged into a chute, and thence into bags.

Fluffy Soap Powder Made from Petroleum. *Drug Trade News,* 10, 11, 1 (May 27, 1935). Powdered cleaning soaps made without the use of a large quantity of water by the interaction of fatty acids, derived from the oxidation of petroleum products, and solid alkali are the subject of U. S. Patent 1,999,184 recently issued to the Standard Oil Development Company of New York City. This process is said to result in a soap powder which is light and fluffy and can be easily ground to a fine powder.

The fatty acids used in the manufacture of these soap powders may be obtained by oxidizing paraffin wax with strong nitric acid, air, oxygen, or oxidizing gases. In addition to paraffin waxes, ceresin, ozokerite, Palembang wax, slop wax, wax tailings, or Montan wax may be oxidized to corresponding acids.

The acids obtained by the oxidation of petroleum or mineral products may be used alone or mixed with oleic acid, stearic acid, distilled cottonseed oil acids or other natural fat soap stocks. If desired, the resulting acids may be separated and divided into several fractions, the initial fraction containing between 9 to 11 carbon atoms, while the remaining fractions may contain acids corresponding to large numbers of carbon atoms, such as 12 to 18.

The soap powders made from the lower fractions are softer than those made from the higher fractions. The acids may be separated from one another, not only by distillation, but also by filtering off the more solid acids from the liquid ones.

Fillers and abrasives, such as pumice powder, silex, tripoli and infusorial earths may be added. Vegetable ivory dust, a by-product of the button industry and a material which cleans without scratching, may also be used.

Detergents and Emulsifying Agents. U. S. 1,994,-467, March, 19, 1935. Robert B. Flint and Paul L. Salzberg (to E. I. du Pont de Nemours & Company). Single or mixed bases such as methylglucamine, methylxylamine, butylxylamine, ethylglucamine, hydroxyethylglucamine, methylgalactamine, methylfructamine, arabinamine, mannamine, galactamine, butylglucamine, isobutylglucamine, laurylglucamine and dimethylfructamine (details of preparing some of which are given) are caused to react with acids such as oleic acid, stearic acid, or other acids such as lauric, behenic, hydroxystearic, coconut oil acids, elaidic, erucic, brassidic, eleostearic, China wood oil acids, stearolic, linoleic, linolenic, linseed oil acids, behenolic, ricinoleic, castor oil acids, sulfated higher alcohols such as lauryl and stearyl sulfate, sulfonated fish oil, sulfonated mineral oils, alkyl naphthalenesulfonic acids, sulfonated oxidized mineral oils, the so-called mahogany sulfonic acids, sulfonated abietenes, hydroxy sulfonic acids, abistic acid, resins of high acid number such as glyptals, acid phthalic esters of fat acid glycerides, etc., to form salts which may be used as detergents, emulsifying agents for insecticides, polishing and waterproofing compositions in cosmetics, shaving creams, shampoos, in the preparation of soluble mineral oils, in textile lubrication, etc. (C. A. 29, 7, 3188, May 10, 1935.)

Glycerol Production by Fermentation. U. S. 1,990,908, February 12, 1935. William F. King, Jr., and Frank A. McDermott (to E. I. du Pont de Nemours & Company). A yeast fermentable sugar is fermented by means of yeast while a pH of about 7 to 8 is maintained during the major part of the fermentation by adding NH_3 as required for this purpose, so that the quantity of fixed salts in the fermentation solution is not substantially increased over the quantity originally present in the sugar solution. (C. A. 29, 7, 2297, April 10, 1935.)

Treating Dry Fats or Fatty Acids to Retard Oxidation. U. S. 1,993,152. Eddy W. Eckey, Wyoming, Ohio, to Procter & Gamble Company, Cincinnati, Ohio. Process for treating substantially dry fats or fatty acids to retard oxidation and the consequent undesirable changes. *(Chemical Industries,* 36,

quent undesirable changes. (Chemical Industries, 36,

5, 454, May, 1935.)

WHO WHAT WHERE WHEN WHY ?

C. Bennett Appointed

Wilson & Bennett Manufacturing Company with offices and factories at Chicago, Jersey City and New Orleans, announce the appointment of Mr. C. Bennett, Bennett Brokerage Company, 223 Fourth Avenue, N., Birmingham, Alabama, as their sales representative in Birmingham trade area.

Mr. Bennett is well known to the Birmingham trade and is acquainted with their requirements. He is in a splendid position to cooperate in the solving of container problems.

Wilson & Bennett have recently published a new catalog, "Modern Steel Containers," representing a complete manual on the subject of steel containers. It is available to those interested by writing to the Chicago office.

Cliffs-Dow Chemical Company Organized

The Dow Chemical Company of Midland, Michigan, and the Cleveland-Cliffs Iron Company of Cleveland, announce that they have joined in organizing the Cliffs-Dow Chemical Company. The new company was incorporated at Lansing with an authorized capital of 25,000 shares of "A" preferred, 10,000 shares of "B" preferred, and 25,000 shares of common stock. The amount of capital issued at this time was not stated, but it is understood that arrangements have been made to dispose of shares to provide money for further expansion and development. The Cleveland-Cliffs Iron Company has owned and operated a chemical plant at Marquette, Michigan for 30 years. The scope of the new company will be to manufacture chemicals derived from wood, a field in which both companies have been experimenting and carrying on research work. The location at Marquette is considered a very favorable site as it is adjacent to the large timber holdings of the Cleveland-Cliffs Iron Co.

Develops New Merchandising Plan

Manufacturers of soaps, perfumes and similar merchandise sold in department and general stores will be given an opportunity for representation in the Chicago Wholesale Market District after July 15 by a new merchandising plan originated by L. I. Neff & Co., Inc., manufacturer's agents.

The newly organized firm will represent one responsible manufacturer from each of more than 150 noncompetitive lines carried by the small department store. It will display merchandise to department store buyers in its sales rooms in the Brooks Building, 223 W. Jackson Blvd., in the heart of the wholesale district, and it will advertise and publicize the lines represented among 5,000 owners of department stores in Illinois, Iowa, Wisconsin, Indiana, Michigan and Kentucky.

Mr. Neff, the founder of the new merchandising plan, has been associated for many years with dry goods advertising and merchandising in Chicago.

New Plant Completed

The new manufacturing plant of Bennett-Clark Company, Inc., in Nacogdoches, Texas, has been completed and offices and all operations of the company have been located in that city since May 18.

Edward Rosendahl Visits European Representatives

Edward Rosendahl, Vice-President and General Manager of the Glyco Products Company, Inc., New York City, left for a business trip to Europe on the S. S. Berengaria on June 19. Mr. Rosendahl will visit the Glyco Products Company's Continental European representatives, General Industrielle in Paris; and the company's British representatives, Rex Campbell & Co., in London, with a view of obtaining first hand information on the European market.

New Type Laboratory Apron

The Blossom Manufacturing Company, of New York City, is manufacturing a new type laboratory apron made of oiled silk and oiled pongee. The fabrics are manufactured by General Electric Company especially for this purpose. The apron is strong, durable, light in weight, fits well and resists most acids. It will not stick, and contains no rubber of any kind.