ABSTRACTS

Oils and Fats

Edited by
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oil which has been previously heat-treated is mixed with a monoglyceride of a drying oil acid such as linoleic or eleostearic acid and with phthalic anhydride, and the mixt. is heated (suitably to about 250° for 15 min. or longer).—(*Chem. Abs.*).

Synthetic resins. Israel Rosenblum. Brit. 457,494, Nov. 30, 1936. Addn. to 444,021. Oil-sol. resin are prepd. by causing glycerol, phthalic acid (**I**), a polybasic aliphatic acid being in amt. more than 15% but not more than in equimol. proportion based on the amt. of **I**, and the amt. of fatty acid being in excess of 1 mol. for each mol. of dibasic acid. Suitable polybasic aliphatic acids include malic, maleic, fumaric and succinic. The resins are sol. in C_6H_6, PhMe, solvent naphtha, petroleum distillates, Me_2CO and alc. and miscible with oils, resin varnishes, natural and synthetic resins and nitrocellulose. To blend the product with China wood oil, the resin is desirably produced in the precence of the oil. In examples, soybean-oil fatty acids, phthalic anhydride, maleic acid and glycerol are used.—(*Chem. Abs.*).

Synthetic resins. The Resinous Products & Chemical Co. Ger. 637,602, Oct. 31, 1936 (Cl. 12_o. 26.02). A mixt. of castor oil and a half ester of maleic acid and a monohydric alc., or a polyhydric alc. etherified by an alkyl residue contg. onyl one OH group, is heated to 150-250° to give a resin. Several examples are given.—(*Chem. Abs.*).

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Soaps

Edited by M. L. SHEELY

New Uses for Fatty Acids. *Soap, Perfumery & Cosmetics* **10,** 215 (1937). It is difficult to saponify the last traces of oil in the manufacture of shampoos. An excess of potash lye or mixed potash and soda lyes can be deliberately added to ensure complete saponification of the oil or oils in the batch. When the reaction has gone to completion, coconut and/or olive fatty acid equivalent to the excess lye may be added. Since it is a contact reaction between the fatty acid and lye, a neutral or slightly alkaline product can be made as desired.

To develop a sheen in stearic acid creams, such as the vanishing and brushless shave type, a little oleic acid has long been employed. Coconut fatty acid will do the same job in most formulations and while it does have a slight characteristic odor, it is not difficult to cover as the finest oleic and it remains "sweet" indefinitely.

Much of the labor involved in making shaving cream can be eliminated by using the coconut and/or olive fatty acids in amounts equivalent to the corresponding oils in the formula. The procedure is quite simple. Melt half the stearic acid and all of the straight or mixed fatty acid. Add the glycerin to the warmed alkaline solution and run the latter into the former with agitation. Then run in the remaining melted stearic acid. This ensures that the excess acid present is stearic.

Soaps as Lubricants in the Rubber Industry. *Soap, Perfumery & Cosmetics* **10,** 240 (1937). The main purpose of a lubricant in moulding rubber goods is to prevent the rubber attaching itself to the mould surface. Experiments with sodium and potassium stearate and oleate soaps in distilled water solution showed that the harder soaps were much more effective than the soft ones at low concentrations. Sugar solutions were only effective at relatively high concentrations. French Chalk, a well-known and widely used mould lubricant, suffers from the disadvantage of causing bad scaling and unevenness of mould surface.

One point which must be watched is the tendency of soap solution to gel on standing in cold solution. Strengths used in the rubber industry usually range between 1.5 and 3 per cent. Many soaps submitted as suitable lubricant types will gel at these concentrations on standing overnight at normal temperatures, say, 60° F. The trouble can be overcome by incorporation by the rubber manufacturer of a little cyclohexanol (about 0.5 per cent) in the solution.

Wetting and Detergency. *Soap, Perfumery & Cosmetics* **10,** 220 (1937). A symposium devoted to the subject, "Scientific and Technical Aspects of Wetting and Detergency," was held on February 19 and 20 at the Huxley Building, Imperial College of Science and Technology, Kensington, S.W.7, under the auspices of the British Section of the International Society of Leather Trades' Chemists. Among the papers presented were the following:

Internal Solubility in Soap Micelles—A. S. C. Lawrence.

The Chemistry of Wetting-Out Agents—H. K. Dean.

Solvent Action of Detergent Solutions—G. S. Hartley.

Some Detergent Problems of the Woolen and Worsted Industries—H. Phillips.

Penetration of Fabrics by Detergent Solutions—J. Pewney.

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Some Factors in Detergency—Eric K. Rideal.

The Mechanism of Detergent Action—Conmar Robinson.

Some Aspects of the Action of the Newer Detergents —E. T. Williams, C. B. Brown and B. H. Oakley.

Fatty Acid Saponification. *Soap* **13,** No. 4, 61 (1937). When saponifying fatty acids with soda ash, hot fatty acids may be added to the carbonate with a spraying device by which they are introduced in a finely divided state. The carbonate may also be added through a spray to promote escape of CO_2, and to avoid raising of the mixture, or the whole of the carbonate charge may be put in the kettle and dissolved in H_2O before addition of fatty acids. The charge will swell during saponification. Hot water may be added to reduce the volume of the mass and make the soap smooth. It must never be allowed to become so thick as to prevent escape of CO_2. It is necessary to determine the content of free fatty acids present by calculating the acid number and saponification number. The percentage of fatty acid equals the number of cc. of 0.5 N KOH solution used for the determination of acid number, times 100, divided by the number of cc. of 0.5 N KOH solution required in determination of saponification number. (*Deutsche Parfumerie* Ztg. **23,** 32-5).

Soap Preservatives. Soap, No. 4, 21 (1937). The following list of preservatives has been suggested: 1. Borax. 2. Sodium thiosulfate. 3. Sodium hydrosulfite. 4. Sodium sulfite. 5. Salicylic acid. 6. Sodium salicylate. 7. Benzoic acid. 8. Sodium benzoate. This has been amplified by including stannous chloride, stannous oxide, sodium stannate, magnesium silicate, formalin para-formaldehyde, as well as many of the antitoxidants used in the treatment of oils.

The proportion of preservative used must necessarily be very low. In works practice, about 0.25 per cent thiosulfate in aqueous solution is recommended for semi-boiled and cold process soaps, but much greater quantities are sometimes recommended. Never more than 3.3 per cent of thiosulfate (crystallized) should be used; 2 per cent sodium sulfite (anhydrous); 3 per cent borax (crystallized); 2.5 per cent sodium benzoate. The optimum amount of stannous chloride to be used is about 0.2 per cent.

Limited use is also made of derivatives of polyhydric phenols containing hydroxyl groups together with ethyl ether, propenyl and ethyl groups. Sodium hydrosulfite is an excellent preservative, as well as a useful bleach. Unlike some other chemicals it does not absorb alkali and so upset the fit of the soap when added to the kettle. In the case of ordinary well-boiled soaps sodium hydrosulfite can be added direct to the fitted soap and stirred well into the mass so that uniform distribution is assured. Approximately 0.1 per cent will be sufficient, and this amount is able to exercise both preservative and bleaching action. This salt is particularly valuable when dark colored oils are used. For soft white soaps, 0.2 per cent is necessary and this must be well crutched in by machine.

Polymerized Oils for Soap-Making. *Perfumery Essent. Oil Record* **28,** No. 3, 113 (1937). Various methods have been proposed during recent years for polymerizing soya bean and fish oils, and so rendering them more serviceable as soap-making materials. Most of these have involved subjecting the oil to heat treatment, with or without a catalyst, and it has been claimed that such oils give more stable soaps, and are indeed suitable for the preparation of toilet soaps. A new method of electrical polymerization has recently been proposed, the oil being exposed to thin films to a high frequency alternating current—500-700 oscillations per sec.—when the oil becomes less unsaturated, with decrease in iodine value, but no appreciable alteration in the saponification value.

Sodium Metaphosphate in Machine Dishwashing. *Ind. Eng. Chem.* **29,** 145 (1937). During the past several years B. H. Gilmore of the Calgonizing fellowship (1100) has been engaged in a study of sodium hexametaphosphate as a normalizing agent for water and as an adjuvant to all alkaline detergents. The incorporation of this substance as an ingredient of an alkaline detergent for machine dishwashing represents an outstanding advance in this field of cleaning. Sodium metaphosphate, by exercising its characteristic property of sequestering calcium and magnesium ions, prevents completely the deposition of the objectionable film and scale of insoluble alkaline earth salts and soaps that are inevitably formed when alkaline detergents are used in washing dishes in unsoftened water. Owing to their extreme physical cleanness, dishes and glassware washed with Calgonite present an unusually attractive appearance.

The utilization of the film-preventive function of sodium metaphosphate also represents a novel and important addition to sanitational progress in machine dishwashing. Film formation on dishes is a source of great concern to health and restaurant officials because such films form an ideal environment for bacterial growth. Bacteriological results obtained in restaurants under routine operating conditions indicate the superior sanitary quality of dishes washed with an alkaline detergent containing sodium metaphosphate. This superiority is not attributable to its germicidal action, but to its specific function of preventing the deposition of organic and inorganic film.

Determination of Hardness in Water by Means of Soap Solutions. Halvard Liander, *Iva* **1936, 94-109.** With pure Ca or Ba salt solns., the Clark method (Brit. pat. 8875 (1841) gives accurate and reliable results. The method can be used for Mg. salts, if used for titrating a soap of a satd. fatty acid, e.g., palmitic acid, whereas results will be inaccurate with oleate. It should be noted that soap solns. must be standardized against a salt of a metal with which they are to be used, since the soap con-

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sumption for equiv. quantities of Ca, Mg, or Ba salts is not the same. For a given metal, the identical results depend upon the nature of the anion, and within a concn. range of about 0.5-12° dH the soap consumption is proportional to hardness. For mixts. of Ca and Mg salts or for most natural waters the method is less suitable. A factor which appears to affect the results to a considerable extent is the choice of the soap, and it is advisable under all conditions to use a soap of a satd. fatty acid. The accuracy of the Blacher method (C. A. 2, 2913), which is unquestionably more dependable for detg. hardness in natural waters, can be increased by the aid of a comparison soln. titrated to a definite pH. The comparison soln. should be very strongly buffered and contain one or more drops of an emulsifying oil, which forms a pure white emulsion. (*Chem. Abs.*)

PATENTS

Sulfate Detergents in Bars. German Patent No. 638,302, I. G. Farbenind. A.-G. Water-soluble salts of the sulfuric esters of aliphatic alcohols or of olefins are converted for domestic use into bars or similarly shaped pieces. Small proportions of ordinary soap may first be mixed with the ester salts. (*Soap*).

Detergent. Can. 361,834, Nov. 17, 1936. Fay H. Guernsey (to Electric Smelting & Aluminum Co.). A composite detergent comprises not more than 4% of a rapidly sol. inhibitor of protein coagulation, such as glycerol, 1-15% of a quickly sol. alk. detergent, such as Na_2CO_3, 10-40% soap, and a NaAl silicate graded to become dissolved in a water bath after the inhibitor and alk. detergent are completely dissolved. The soap is selected according to its titer and particle size to enter into soln. after complete soln. of all the other ingredients. (*Chem. Abs.*)

Reducing the Dustiness of Coal, Coke, or Other Dusty Materials. U. S. 2,068,489, Jan. 19. Benjamin R. Harris. The material is sprayed with an aq. soln. of glycerin "foots" which may be preliminarily subjected to a steam-distn. treatment to remove substances having or producing objectionable odors. (*Chem. Abs.*)

Preventing Oxidation and Darkening of Soaps. Swed. 87,675, Oct. 20, 1936, A. Hellstrom. Alkali phosphates, e. g., in amt. 1-20% by wt., are incorporated in hard or soft-soaps from tallow to prevent oxidation and darkening. (*Chem. Abs.*)

Wetting Agents, etc. Brit. 453,134, Sept. 4, 1936. The Procter and Gamble Co. Metallic salts of the H_2SO_4 esters of alcs. are prepd. by the direct union of alcs. having at least 8 C atoms with the reaction products of SO_3 and metallic chlorides. The products have wetting, sudsing, emulsifying and detergent properties. The finely ground reaction product of SO_3 and KCl, NaCl, NH_4Cl, $MaCl_2$ or $NiCl_2$ may be slowly introduced into a mill contg, lauryl alc. and the temp. prevented from rising above 30°. The product may be worked up by (a) adding H_2O contg. sufficient alkali to neutralize the mxt. or (b) treating with hot EtOH contg. alkali, filtering and crystg. (*Chem. Abs.*)

Manufacture of Esters Containing a High Proportion of Monoglycerides. U. S. 2,073,797, March 16, 1937. T. P. Hilditch and J. G. Rigg to Imperial Chemical Industries Ltd. Esters containing a high proportion of monoglycerides are made by esterifying glycerol with one or more fatty acids in a solvent medium composed of one or more monohydric mononuclear phenols.

Hydrogenating Fats and Fatty Acids. Brit. Pat. 452,887. Metallges. Akt.-Gea., 45, Bockenheimer Anlago, Frankfort-on-Main, Germany, and O. Brucke, 7, Herzogstrasse, Zurich, Switzerland.—Fatty acids with two or more unsaturated linkages, mixed or not with neutral oils or fats, are hardened by treatment with hydrogen in presence of a hydrogenating catalyst at 80-130° C. and about 25 atmos. pressure. The mixtures may first be freed from dirt, mucinous bodies, or other impurities. In an example, train oil fatty acid is hardened at 90-100° C. in presence of nickel formate. Reference has been directed by the Comptroller to Specification 2307/14 (Class 1 (i).—British Patent.) Oil Colour Trades J. 91, 437 (1937).

Bath-Soap Composition. U. S. 2,061,468, Nov. 17, Walter Kling (to H. Th. Bohme A.-G.). A soap compn. adapted to produce a nonalk. soln. upon hydrolysis in water comprises an alkali metal salt of a sulfuric acid ester of a higher aliphatic alc. having 12-18 C atoms such as Na dodecyl sulfate and about 10% of a superfatting agent comprising lanolin, wool fat or a higher aliphatic alc. having more than 8 C atoms. (*Chem. Abs.*)

Leather-Cleaning Composition. U. S. 2,064,285, Dec. 15, 1936, Wallace J. Yates (to Sholl Development Co.). A "substantially pure com." oleic acid, which contains combined Fe in a concn. sufficient to cause the discoloration of leather cleaned with a cleanser contg. a dry-cleaning soap of the acid, is treated with tannic acid to form Fe tannate and reduce the concn. of Fe in the oleic acid to less than 0.001%; the treated acid is sepd. from the Fe tannate and is saponified to form a dry-cleaning soap and this soap is mixed with a dry-cleaning solvent. (*Chem. Abs.*)

Water-Softening Cleanser. U. S. 2,065,117, Dec. 22, 1936, Bert O. Crites to (Climalene Co.). Normally solid com. soap-making fatty acids about 45-65 parts are melted and heated to about 50° and stirred, with addn. of Na_2CO_3 about 35-45 and Na_3PO_4 about 2-10 parts and continued stirring until balls of pebble-like character are formed, and these balls are disintegrated to produce firm, substantially dustless, coherent particles of uniform comp. (*Chem. Abs.*)