ABSTRACTS

Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

(95%) and warmed; 1 c.c. of alc.-KOH is added, the test tube attached to 1 m. glass tube and oil is saponified on a water bath for ¼ hr. After cooling alkannin soln. (alkannin fat sol. red in alc.) is added until the solns. are blue. Then 5 drops of sudan soln. (Sudan 7B in alc.) are added. The soln. is poured out and the test tube rinsed and filled with distd. water. A red ring on the test tube at the boundary where the blue soln. had been indicates that mineral oil was present. The sensitivity of the reaction is improved by using ice cooled distd. water and by centrifuging the test tube.

Consistent fats (greases). G. Ritter. *Chem.-Ztg.* **61**, 908-10 (1937).—Discussion on the fats and metallic soaps used for manufacture of lubricants.

Polymerization of fat. II. The action of sulfur monochloride on fat (Studies in the fat field 39-41). H. P. Kaufmann, J. Baltes and F. Mardner. *Fette u. Seifen* **44**, 337-40, 390-4 (1937).—Data on the reaction of sulfur monochloride on several oils and fat acid esters are presented.

Fats as protective coatings and their substitutes. J. Scheiber. *Fette u. Seifen* **44**, 323-30 (1937).

Tropic lacquer. E. Fonrobert and K. Bruckel. *Fette u. Seifen* **44**, 432-4 (1937).—A tropic lacquer should be formulated to withstand both intense humidity and sun rays. A lacquer which is stable against the tropical weather is prepd. with "albertol" using a 1:1 linseed and wood oil mixt. A film with a larger proportion of linseed oil softens during considerable rain. Linseed to wood oil ratio should not exceed 1:2 to preserve the elasticity. A recommended formula is: 1 part Albertol III L (a phenol resin condensation product m.p. 106-133° C) 1.7 pts. thickened wood oil and 1.7 pts. of linseed oil stand oil.

PATENTS

Preparation of emulsions. R. C. Newton, W. F. Bollens and L. C. Brown (to Industrial Patents Corp.). U. S. 2,098,010. One object of the invention is to provide a method of manufg. oleomargarine, butter and similar emulsions whereby a very finely emulsified product is produced. The oil or fat is melted, water is added, the mixt. is cooled quickly to a temp. considerably below its congealing point, the mixt. is immediately agitated to secure a fine degree of dispersion of moisture throughout the oil, and the oil is permitted to crystallize at or slightly below its congealing point.

Treatment of olive oil to prevent stearin coming down at low temperatures. W. Clayton, S. Dack, J. F. Morse and R. I. Johnson (to Crosse & Blackwell Ltd.) U. S. 2,097,720.—Small amts. of polymerized oxidized mono-unsatd. disatd. glyceride or oxidized cacao butter are added.

Stabilization of baking fat. Industrial Patents Corp. Ger. 650,285 Cl. 53h G 1/03. Addn. to 628,690. —A small amt. of distillate from the deodorization of sesame oil is used as an antioxidant.

Apparatus for extracting oils from oleaginous materials. H. H. Bighouse (to the C. O. Bartlett & Snow Co.). U. S. 2,096,728.—Structural features of an extn. app. built on the counterflow principle are described.

Stabilization of glyceride oils against oxidation. S. Musher (to Musher Foundation, Inc.). U. S. 2,093,971.—Crushed sesame seeds are used as antioxidants for oils and fats.

Improving oils and fats and other glycerides of fat acids. W. Ekhard. Brit. 465,111. A process for improving the odor, taste, stability and consistency of vegetable and animal oils and fats and other glycerides of the fatty acids by means of microorganisms which comprises intimately mixing by mechanical means the substance to be improved with an aq. soln. of sugars as fermentable medium which is caused to undergo intensive fermentation by means of sugar fermenting microbes, such as saccharomycetes (yeasts) or acidifiers, for instance, lactic acid producers such as bacillus Leichmann, bacillus bulgaricus, streptococcus thermophilus, or other acidifiers such as microbes producing propionic acid, butyric acid and other organic acids and after the fermentation has ceased, separating the treated material from the products of fermentation and all other substances.

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Soaps

Edited by **M. L. SHEELY**

How Detergent Solutions Work. *Chem. Trade J.* 13 (Jan. 1, 1937).—It is possible to distinguish between at least 5 different, but related, processes which possibly occur when a wetting (or detergent or emulsifying) agent is dissolved in water and brought into contact with greasy matter. These are: (a) Lowering of the surface tension of the water; (b) wetting of a solid surface; (c) penetration of the aqueous solution into capillary spaces, such as those in a heap of coal dust or a sized or greasy textile fibre; (d) dispersion or emulsification of grease or other hydrophobic dirt in the water; (e) detergent action.

There is some little experimental evidence that a low surface tension of the aqueous detergent solution against air, or a low interfacial tension against oil, are not the sole, or the predominating, factors in producing a good detergent. Many substances lower surface tension considerably, but have no detergent action worth mentioning; an example is soap and alkyl sodium sulfates.

Measurements (Robinson and Selby) of the interfacial tension between various detergent solutions and oils have shown several points. Sodium cetyl sulfate lowers interfacial tension very little more than sodium cetane sulfonate, but washing tests show that generally the cetyl sulfates are much better detergents than the cetane sulfonates.

The importance of other factors in detergent action has been shown conclusively by the fact that different

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detergents differ very much in their order of efficiency when used for washing cotton and when used for wool. For wool, some 10 different detergents give a 10- or 20-fold range of efficiencies, measured by the concentrations required to clean a given standard sample of wool dirtied artificially with lanolin black. The same detergents are much more nearly equally efficient when tried on cotton. Dr. N. K. Adam. (British "Chemical Trade Journal," Jan. 1, 1937, p. 13.)

The Value of Rustproof and Acidproof Steel in Producing and Processing Soap. H. Hougardy. *Fette u. Seifen* **44**, 230-4 (1937).—Tabulations are given of the properties of various Cr, Cr-Mo, Cr-Ni and Cr-Mn alloy steels which are useful for making autoclaves for fat splitting at 225-230 degrees and for making various other devices used in handling and processing fatty oil, fat acids and soaps. (*Chem. Abs.*)

The Technic of Boiling Soap in the Present and the Future. Julius Schaal. *Seifensieder-Ztg.* **64**, 627-8 (1937).—Carbonate sapon. of fat acids, continuous sapon. and similar methods are recommended as improvements on the widely used method of sapon. with alkali. (*Chem. Abs.*)

The "Descha System," a New Boiling Procedure for Soap Bases and Curd Soaps. J. Schaal. *Oel, Fette, Wachse Seife Kosmetik* **1936**, No. 13, 7-8.—The "Descha" process rapidly and completely saponifies the soap stock in a crutcher or similar app. and seps. the glycerol by graining out the soap with aq. NaCl and caustic solns. When conditions are properly controlled, the soap usually contains 68-70% fat acids and is ready for immediate piling. Advantages of the process include: large savings in time, appreciably improved soap yields, reduced amts. of steam consumed during sapon., production of lyes having higher glycerol contents and avoidance of expense of drying the finished soap prior to piling. (*Chem. Abs.*)

Use of Wetting Agents in Flotation. R. S. Dean, J. Bruce Clemmer and S. R. B. Cooke. *U. S. Bur. Mines, Repts. Investigations* No. **3333**, 3-20 (1937).—Pure reagents of the wetting type have few collecting properties for sulfides or nonsulfides unless a small amt. of an aliphatic acid, such as oleic, is added. In many cases residual aliphatic acids in the reagents, or those resulting from hydrolysis of their solns. on standing, are sufficient to make the wetting agents selective collectors. Prior emulsification of the aliphatic acids increased their efficacy and permitted flotation at temps. less than the f.p. of the acid. (*Chem. Abs.*)

Synthetic Washing Agents. G. S. Ranshaw. *Chemical Age* **37**, 133 (1937).—The lamepons represent a new departure in so far as solubility or hydrophylic nature is obtained by the accumulation of CONH- and carboxyl groups. They are obtained by the condensation of fatty acid chlorides with protein decompostion products from leather waste, according to the following scheme:

$C_{17}\ H_{33}\ \ CONHR_1\ (CONHR_2)_x\ COON_a$

It will be seen that there is here a definite polar structure coupled with colloidal properties, giving power to disperse lime soaps in spite of the presence of the free carboxyl group, owing to the preponderance of the CONH- groups. Their detergent power, together with high wetting power and emulsifying capacity, insures these products a wider utility than that of soap so far as textile operations are concerned.

Hydrolysis of Soaps. P. N. Das Gupta. *Indian Soap J.* **3**, 200-3 (1937).—The following procedure was carried out on a no. of oils and fats: 5 g. of the fat was sapond. with 50 cc. 0.5 N alc. KOH and the liquid was neutralized with 0.5 N HCl and evapd. to dryness. The residue was made up to 100 cc. with hot distd. H_2O, and 10 cc. was taken in a 500-cc. beaker, dild. with 250 cc. distd. H_2O and titrated with 0.1 N HCl with phenolphthalein and then methyl orange as indicators. The no. of cc. of acid required for the 1st and 2nd titrations were noted. The first titration (a) gives the hydrolyzed soap and the 2nd (b) gives the total combined alkali, and their ratio $a/b \times 100$ gives the percentage of hydrolysis. The method for toilet soaps is similar. From a comparison of the figures obtained it appears that the toilet soap bases with greater hydrolysis contain more tallow. The soaps with low hydrolysis contain more coconut oil and hardly any tallow. The property of soaphydrolysis is additive Stocks (C.A. 18,760), by taking different percentages of castor and arachis oils, detd. the hydrolysis of the soaps from such mixtures, and from the hydrolysis figures calcd. the percentages of arachis oil in the mixts., which values almost coincided with the quantities of the oil taken. (*Chem. Abs.*)

Soaps and Synthetic Washing Agents. Welwart. *Seifen-Fachbl.* **8**, No. 2, 2-4 (1936); *Chem. Zentr.* **1936**, *I*, 3768.—After a historical review of the development of the soap industry, the difficulties encountered in treatment baths when the ratio of soap to synthetic washing agent is unsatisfactory are pointed out. Condensation products from fatty acid chlorides and aminoethanesulfonic acid agglutinate aq. soap solns.; conversely, aq. solns. of these products agglutinate soap solns. By the use of 1-3 parts curd soap (60-62% fatty acid content) to 1 part of the above condensation products the agglutination is so complete that the desirable properties of both washing agents are lost. The view is expressed that other products contg. sulfonic acid groups should produce agglutination in soap solns. (*Chem. Abs.*)

Soaps or Synthetic Washing Agents? *Textile Colorist* **59**, No. 707, 744 (1937).—Research on synthetic washing agents continue in large volume, and an interesting class of bodies to be recently introduced is represented by fatty condensation products in which the solubilizing component introduced is not the SO_3H group, but decomposition products of certain proteins. These consist chiefly of amino acids, and are easily soluble in water. They are also insensitive to acids and to lime. These amino acids can be condensed with fatty acids to give condensation products having distinctly soapy properties.

Stability of Sodium Perborate Solutions. *Textile Colorist* **59**, No. 707, 745 (1937).—The addition of soap to aqueous solutions of sodium perborate has a very marked stabilizing effect, but even in the presence of soap the pH still remains an important factor.

No appreciable chemical damage to the fabric is caused by solutions of sodium perborate in the absence of soap even at the boil, unless the concentration of

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perborate is above 100 grains of $NaBO_3$, $4H_2O$ per gallon. In the presence of soap, however, the damage may be very great under such conditions.

Sodium perborate is ineffectual as a bleach in the absence of soap unless used at excessively high concentrations, when the damage to the fabric is extremely great. When soap is present the amount of damage suffered by the fabric is approximately proportional to the concentration of perborate at any specified temperature, but the bleaching properties do not improve with increase of concentration beyond a certain point.

The selection of the best conditions of concentration and temperature for good bleaching accompanied by no undue deterioration of the material is a matter for careful consideration, but it is evident that the process is best carried out in a hot wash liquor or at the boil, when full advantage can be taken of the beneficial action of the soap present. Under no circumstances should the bleaching of cotton fabric be carried out in a liquor free or almost free from soap. It may be taken as a general rule that according to the degree of staining and the distribution of the staining, temperatures between 60° and 100° may be used for bleaching, but the higher is the temperature used the lower should be the concentration of perborate.

Soap Containing Silk Being Manufactured—Europe. *World Trade Notes on Chemicals & Allied Products* **11** [43], 710 (1937).—"Silk-soap," containing 5 per cent low grade silk waste, is now being manufactured and marketed in Germany, France, Switzerland, and Czechoslovakia. So far this soap has been manufactured only for toilet and household use, and in an experimental form as a mouth wash but it is claimed that it can be prepared in powder, cream, and liquid form and that it may be adapted to industrial uses. In the manufacture of "silk-soap" a low grade silk waste is employed which is stated to have little or no commercial value for other purposes and therefore does not add appreciably to the cost of production. (Office of American Commercial Attache, Berlin.)

Skin Protection and Shaving Soaps. Oculus. *Seifensieder-Ztg.* **64**, 264-5 (1937).—The normally acid reaction of the skin is least disturbed by using a shaving preparation having a mildly acid reaction. The tendency of shaving soaps and lipsticks, made from fats rich in stearic acid, to acquire a rough surface can be avoided by preventing drying out of the surface and by substituting ricinoleic acid for stearic acid as acidifying agent. (*Chem. Abs.*)

Formation of Spots in Refined Soaps. H. Braun. *Riechstoff Ind. Kosmetik* **12**, 124-5 (1937).—Spots are said to be due to the following factors: (1) dry soaps undergo this change easily, (2) soaps contg. cottonseed and olive oils are subject to the same change, (3) bacteria, (4) dyestuffs, (5) rancid fats, (6) metal impurities and the formation of metallic soaps and (7) perfumes. (*Chem. Abs.*)

The Purification of Glycerol Water. Hans Dorner. *Seifensieder-Ztg.* **64**, 225-6, 244-6, 261-2, 280-2, 298-9, 317-19 (1937).—Glycerol waters, obtained on splitting fats with enzymes or by the autoclave process with either Twitchell reagent or basic catalysts, e.g., ZnO, vary somewhat in compn.; the corresponding necessary variations in purification methods are discussed in detail, special attention being devoted to (1) the Verbeek process (cf. C. A. 15, 2738-9) in which $BaCO_3$, $Al_2(SO_4)_3$, $Ba(OH)_2$ and $(NH_4)_2 SO_4$ are used and (2) unsolved problems arising from the presence, in glycerol waters, of dissolved lower fat acids or their more or less sol. salts. Correction. Ibid. 302. (*Chem. Abs.*)

Liquid Soaps. *Soap, Perfumery & Cosmetics* **10**, 836 (1937).—When coconut oil is used alone in liquid soaps, the lathering is plentiful and forms quickly but lacks body. Castor, peanut, sesame or olive oil should be added.

For the rapid clarification of liquid soaps, an addition of pure, freshly precipitated aluminum hydroxide is advised. This cuts down the settling period from fifteen to two days.

Liquid soaps are known to have skin irritating effects. A satisfactory explanation is not yet forthcoming. It has been pointed out that liquid soaps are used on the skin in much lower aqueous concentration than the best toilet soaps and are thus more prone to hydrolysis. Permulgin (a sulfonated oil product) is said to suppress the skin irritating tendency of liquid soaps.

New Soap Ingredient. *Chemical Industries* **41**, 380 (1937).—A purified form of evaporated sulfite cellulose liquor, known as Zewa powder, suitable for use in soap manufacture, especially soft soaps, soap powders and flakes, has been put on the market by a German manufacturer of mechanical and chemical wood pulp. Powder is nearly white and only takes on a yellowish-brown color when in contact with water.

The Preparation of Soap Chips When Water-Free Filling Materials Are Used. Oculus. *Seifensieder-Ztg.* **64**, 296-7 (1937).—Soap chips contg. $NaHCO_3$, borax or similar salts are apt to be excessively brittle and difficult to prep. in proper form. Such difficulties can be overcome by using soaps of high plasticity or by using Na caseinate, Tylose, saccharates, etc., to improve the plasticity of the soap before incorporating the $NaHCO_3$ or other salt prior to chipping. (*Chem. Abs.*)

Spectrophotometric Grading of Vegetable Oils. *Technical News Bulletin of the National Bureau of Standards* No. **247**, 115 (1937).—Recently, Kasson S. Gibson, chief of the Bureau's colorimetry section, has examined data secured by H. J. McNicholas on the Lovibond grading of oils. On the basis of these data, Dr. Gibson concludes that there is no significant correlation between the lightness or darkness of an oil and the Lovibond grade assigned to it by the practical color grader. The Lovibond color grade of a vegetable oil may, therefore, be computed from its spectral transmittance by colorimetric methods without taking into account the luminous transmittance of the oil. This method of grading might serve to settle disputes among the oil chemists as to the correct Lovibond grade of an oil.

PATENTS

Molded Fatty Alcohol Sulfates. U. S. Pat. No. 2,088,308. Walther Schrauth.—A detergent in molded form consists of approximately 53 per cent of the sulfonates of a 1:1 mixture of oleyl alcohol and saturated alcohols having 16-18 carbon atoms in the molecule,—40 per cent of the sulfonates of the mixture of

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soap

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alcohols produced by the reduction of the fatty acids from coconut oil,—and 7 per cent of curd soap. (*Soap.*)

Soap Builder. U. S. Pat. No. 2,093,927, Sept. 21, 1937. Walter C. Preston (assignor to The Procter & Gamble Company).—A soap builder suitable for improving the water softening, sudsing and detergent properties of water-soluble soap and suitable for use with water-soluble soap in any proportion needed for varying cleansing requirements and for water of various degrees of hardness without increasing the alkalinity of the soap product beyond a pre-determined low point, comprising a mixture of tetra-alkali-metal pyrophosphate with a sufficient proportion of a compound selected from the group consisting of acids and acid reacting salts, to reduce the alkalinity of the pyrophosphate so that it will have the general average formula

$$MxH_4—xP_2O_7$$

wherein M represents an alkali metal and x has any value less than 4 but not less than 3.54. (*Soap.*)

Liquid Soap. U. S. Pat. No. 2,093,928, Sept. 21. Walter C. Preston (to Procter & Gamble Co.).—A concd. base adapted for use in prepg. from hard water a liquid soap clear at ordinary temp. comprises at least 30% of a water-sol. soap and a sufficient quantity of a water-sol. substance, to prevent the pptn. of lime soap when the base is dissolved in hard water to form a soln. contg. 3-30% of the soap, the substance serving this purpose being a water-sol. pyrophosphate of the character described in U. S. 2,093,927 (preceding patent). (*Chem. Abs.*)

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