ABSTRACTS

Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

Stable Emulsion and Method of Producing the Same. W. Schrauth. U. S. 2,086,479. The emulsifying agent consists of mono- and/or diglycerides and sulfonated alcohols.

Hydrotropic Fatty Material and Method of Making the Same. W. Kritchevsky. U. S. 2,089,212. Hydrotropic fatty materials are prepd. by mixing together alkylolamine and a higher fatty acid, in a ratio of at least 2 mols. of alkylolamine to one mol. of fatty acid, and heating the mixt. at a temp. above 100°C. and below the temp. of decompn. of the resulting hydrotropic fatty material.

Production of Alkylamines. R. R. Bottoms (to the Girdler Corp.). U. S. 2,085,785. A process of making alkylamines, which comprises reacting a lower alkanol with an ammonium halide in the presence of added water and of a halide of metal having an atomic number between 24 and 29 as a catalyst.

Process of Preparing Monohydric Alcohols. A. W. Ralston and J. Harwood (to Armour and Co.). U. S. 2,086,239. An alkyl nitrile having at least 6 C-atoms is converted into its corresponding amine and then this is treated, while in acid soln. with a nitrite of an alkali-forming metal.

Preparation of a Nitrile of an Aliphatic Acid. H. F. Oxley and E. B. Thomas (to Brit. Celanese, Ltd.). Brit. 464,106. Process for the manuf. of lower fatty acid nitriles which comprises heating the NH_4 salt of the corresponding aliphatic acid in admixture with a quantity of the same acid in the free state so as to form the nitrile by decompn. of the NH_4 salt and to distil off the nitrile as it is produced.

Catalyst and Catalytic Process. P. L. Salzberg (to E. I. du Pont de Nemours & Co.). U. S. 2,089,433. The method of prepg. a catalyst which comprises heating to its spontaneous decompn. temp. a multiple chromate of a nitrogen base and a hydrogenating metal whose oxide is sol. in ammonia and thereafter extg. the resulting chromite compn. with aqueous NH_3. In an example, the hydrogenation of cocoanut oil to alcs. with use of this catalyst is described.

ABSTRACTS

Soaps

Edited by M. L. SHEELY

Solvent Soaps. *The Oil and Colour Trades Journal,* Aug. 20, 545 (1937). These types of soaps are reviewed by a writer in Rev. gen. mat. Col. (Feb., 1937).

The incorporation of solvents in soaps to strengthen their detergent action has been practiced for some years. These products can be divided into a number of groups.

(1) Soaps containing Benzene, Toluene, Xylene or Solvent Naphtha.—These are used in dry cleaning. Castor oil soap absorbs an appreciable quantity of benzene. A castor oil soap containing 20 per cent fatty acids and a little rosin will absorb about 8 per cent of its weight of benzene, 11 per cent toluene or 12 per cent xylene. One type of soap used for this purpose is made from oleine and tallow containing 20 per cent fatty acids. This soap will permit the incorporation of 6-8 per cent benzene, 10 per cent toluene and 12 per cent xylene. Solvent soap of this kind is frequently used for degreasing in order to reinforce the action of coconut oil and oleine soap used in degreasing and felting of wool. Usually, potassium carbonate is added to increase detergent action. (Not exceeding 8 per cent on the weight of soap.)

(2) Soaps containing Chlorinated Solvents.—These are often preferred to benzene-containing soaps, as they are non-inflammable. As in the case of benzene, the soap which absorbs most chlorinated solvents is potassium castor oil soap containing 20 per cent fatty acids. It is difficult to incorporate more than 10 per cent tri-chorethylene. This solvent plus carbon tetrachloride or solvent naphtha mixes better with the soap.

Oleins and coconut oil soaps do not absorb the chlorinated hydrocarbons well and, because of this difficulty of incorporation, it is usual to use a mixture of sulphonated castor oil and castor oil soap. This mixture acts very well.

(3) Soaps containing turpentine, eucalyptus or camphor oil are used in the textile industry for removing stains. Turpentine soap, which is readily made by mixing 10 per cent turpentine with a castor oil soap containing 20 per cent fatty acids, has some interest in the cotton industry, for, although it has less solvent action than tetraline soaps, it penetrates very well.

(4) Soaps containing Tetralin and Decalin.—These, first prepared during the war period, have since undergone great developments. 7-12 per cent of these solvents may be readily incorporated in soft oleine soap. The solubility of these solvents in coconut oil soap is greater than this. Indeed, a potash soap made from coconut oil having a pH of 8 can absorb 20 per cent decaline. If the pH is 11-12, the amount of the solvent absorbed is only 11-15 per cent. A mixed castor-coconut oil soft soap absorbs 20 per cent of decalin or tetralin, giving a product very stable to boiling.

(5) Miscellaneous.—These are products which, used in comparatively small quantities, have the effect of improving solvent-containing soaps. Alcohol, carnauba wax, cyclohexanol, methyl cyclohexanol, ethanolamine, di-ethyl amine ethyl oleylamine, are examples of these products. The chlorinated aromatic hydrocarbons, such

ABSTRACTS

Soaps

Edited by M. L. SHEELY

as di-chlorobenzene, act as solvents and emulsifiers of the alcohol ketones and aromatic hydrocarbons. Cyclohexanol and methyl cyclohexanol are solvents which assist the absorption of hydrocarbons in soaps. They are superior to alcohol in their distinctive action.

Refining of Pure Glycerol with Activated Carbon. M. D. Herman. *Mealobeino Zhirovoa Delo* **12**, 550-2 (1936). Expts. in the decolorization and purification of glycerol with various kinds of Soviet activated C are described. The best results were obtained with vegetable and peat C. The opt. conditions are: stirring at 220 r.p.m. with 0.5% C at 65-70° for 50 min. Org. impurities are more easily removed than inorg. Albuminous and mineral impurities are more easily removed from concd. glycerol and coloring matter from dild. (60%) glycerol. The adsorptive power of C increases very little with the greater fineness. (*Chem. Abs.*)

Glycerol Recovery in the Soap Industry by Means of Saponification with Lime. The History of the Krebitz Process. G. Buchner. *Fette u. Seifen* **44**, 147-9 (1937). The success of the Krebitz process depends upon sapong. with lime at a slow controlled rate so as to produce a coarse, porous Ca soap from which the glycerol can be readily and completely extd. with water. (*Chem. Abs.*)

Sweating of Acid (with Free Acid) and Alkali (with Free Alkali) Soaps of Fat Acids Ranging from C12 to C18. N. N. Godbole and P. D. Srivastava. *Indian Soap J.* **3**, 245-50 (1937). Acid neutral and alk. soaps of the fat acids all absorb moisture. The presence of free alkali increases moisture absorption but the presence of free acid retards it. Soaps of the fat acids of high mol. wt. absorb less moisture than those of low. mol. wt. The soaps of oleic acid are more hygroscopic than the soaps of satd. fat acids of corresponding no. of C atms. When free oleic acid is present in the salt, oxidation and moisture absorption is proportionately quicker and greater when the surface exposed is larger. (*Chem. Abs.*)

Amplified Distillation of Binary Aliphatic Acid Mixtures. W. Nelson Axe and A. Calvin Bratton. *J. A. C. S.*, **59**, 1424 (1937). Dilution of acid mixtures with ten volumes of hydrocarbon oil prior to distillation greatly increases the efficiency of separation of the acids.

A modified Dyer analytical method for the acid distillation fractions is proposed.

Sulfite Waste Powder as Raw Material for Soaps and Detergents. Robert Krings. *Allgem. Oel- u. Fett-Ztg.* **34**, 192-6 (1937). "Zewa powder" prepd. by drying sulfite waste liquor is described and recommended as an ingredient of soap and detergents. Soap formulas contg. this product are presented. (*Chem. Abs.*)

Corrosive Effect of TSP. L. A. Rogers and Fred R. Evans. *J. Dairy Sci.* **19**, 733-8 (1936). The effect of sodium chromate, sodium perborate and sodium metasilicate in lessening the corrosive action of trisodium phosphate was tested. From 3 to 5 per cent of sodium chromate, based on the weight of trisodium phosphate used, was found to prevent corrosion. Bacterial counts prove that trisodium phosphate solution is an effective detergent.

Saponification by Means of Sodium Carbonate. R. L. Datta and A. Das. *Ind. Soap J.* V. **3**, 191 (1937). The authors have found the most favorable conditions for saponification by sodium carbonate and have assessed the susceptibility to saponification of different fatty acids. (*Recharches* 1, 68).

PATENTS

Bituminous Emulsions. Brit. 462,111. J. A. Montgomerie and P. K. Archibald. Aqueous dispersions of bituminous and like materials are obtained by dispersing such materials in a hot dilute solution of a fixed alkali, using fatty acid pitch, e.g., stearine pitch, and a protein compound as assistant emulsifying agents, the quantity of water in which the bituminous materials are first dispersed and the proportion of protein compound being sufficient to prevent reversal of the phases. The bituminous materials are defined as pyrogenous residues of organic substances and include pitches, tars, artificial or natural bitumens or viscous hydrocarbons. Hard and soft pitches may be combined or mixed with a suitable flux. The protein material includes casein, glues, gelatins or albumens and is preferably added as alkali, caseinate solution which may be neutralized, e.g., with tannic or boric acid and protected from decomposition. Suitable alkalis include alkaline salts of organic or inorganic acids, esters or gels which are readily hydrolyzed. The fatty acid pitch may be mixed with the bituminous material at 105-110° C. and then stirred into part of the alkali solution, e.g., at 90-100° C., followed by the solution of casein and sufficient water to give a 50 per cent emulsion. Alternatively the bituminous material and fatty acid pitch may be added to the whole of the aqueous phase, or part of the fatty acid pitch may be added to the aqueous phase. According to an example, 180 pts. of coal tar pitch and 20 pts. of stearine pitch at 105-110° C. are stirred into 45 pts. of casein solution (formed from 56 pts. casein, 10 pts. caustic potash, 50 per cent solution 494 pts. water and 11 pts. cresylic acid) and 35 pts. water containing 1 pt. caustic potash at 100° C., followed by the addition of 120 pts. of water. Specifications 255,074 and 308,051 (both in class 81, i), are referred to.

Noncorrosive Antifreeze Solution. Can. 366,297, May 25, 1937. Kenneth H. Hoover (to Association of American Soap and Glycerine Producers, Inc.). A soln. of a relatively small amt. of mercaptobenzothiazole in glycerol is dild. with water to ppt. and disperse mercaptobenzothiazole and to the product are added an oil and an emulsifying agent.

Anticorrosive Liquid Suitable for Use in Engine-Cooling Systems. U. S. 2,080,422, May 18. Kenneth H. Hoover (to Association of American Soap and Glycerine Producers, Inc.). Water is used together with an alc. such as EtOH or glycerole in sufficient proportion materially to reduce the freezing point and with a corrosion inhibitor such as urea.

Abstracts of Papers Presented at Rochester Meeting of American Chemical Society

The following abstracts of papers presented before the Division of Agricultural and Food Chemistry at the Rochester meeting of the American Chemical Society, September 6 to 10, may be of interest:

THE STRUCTURE AND CHEMICAL COMPOSITION OF FATS. J. B. Brown, The Ohio State University, Columbus, Ohio.

Several of the more important contributions of the past few years relative to the glyceride structure of the natural fats and oils are reviewed; the composition and nature of the fatty acids found in some of these fats and oils are discussed.

THE REMOVAL BY HYDROGENATION OF THE PROPERTIES OF COD LIVER OIL WHICH ARE HARMFUL TO HERBIVORA. C. M. McCay, Henry Paul and L. A. Maynards, Cornell University, Ithaca, New York.

Half of a supply of cod liver oil was hydrogenated[1] so that the iodine number dropped from 160 to 70. The original and hydrogenated oils were fed in alternate periods to six milking cows in a daily amount equal to one-third of 1 cc. per kilo of body weight. The untreated oil caused its previously noted effect of lowering the milk fat percentage. In contrast, this percentage was not affected by the hydrogenated product. The latter was consumed readily, whereas the untreated oil was not.

The two oils were fed to growing guinea pigs as four per cent of a basal synthetic diet to test the relative effects of the two oils in producing the degenerative muscle changes previously noted in this laboratory with similar diets. All five animals receiving the untreated oil died or became moribund within seven weeks. On histological study muscle lesions were found in all of the animals that survived more than two weeks. Two of the animals receiving the hydrogenated oil died early in the experiment, but no muscle lesions were found. The remaining three were apparently healthy when killed at eight weeks and showed no lesions on histological examination.

These data indicate that the hydrogenation of cod liver oil causes it to lose the properties which lower milk fat percentage, and preliminary evidence is furnished that this treatment counteracts the properties responsible for the production of muscle lesions in growing herbivora.

THE PROPERTIES OF LINOLEIC ACIDS PREPARED BY DEBROMINATION AND BY LOW TEMPERATURE CRYSTALLIZATION, WITH A PROPOSED METHOD OF QUANTITATIVE ESTIMATION. J. B. Brown and Jerome Frankel, Ohio State University, Columbus, Ohio.

Pure alpha-linoleic acid was prepared by debromination of tetrabromo-stearic acid. The properties of this acid are compared with those of linoleic acid prepared by low temperature crystallization of the fatty acids of corn oil in acetone. A procedure is described for obtaining linoleic acid of 92-94 per cent purity from corn oil in good yield. A direct method for the estimation of linoleic acid in a fatty acid mixture, based on the yield of insoluble tetrabromides in petroleum ether is proposed.

THE INFLUENCE OF BLEACHING ABSORBENTS ON THE STABILITY OF EDIBLE OILS. Ralph A. Hagberg and John W. Hassler, West Virginia Pulp & Paper Co., Tyrone, Pennsylvania.

It is known that bleaching and refining makes oils less stable. Both operations are necessary to make many oils salable. Work was undertaken charting the condition of the oil following the bleaching operation conducted under various conditions. Bleaching absorbents remove certain stabilizing constituents having anti-oxidant properties, e.g., carotene. Adsorbents remove peroxide bodies, so freshly bleached oils have definitely better quality than unbleached oils. It is after an induction period that absence of the stabilizing bodies becomes evident in increased rate of oxidation.

This rate is influenced by the conditions of the bleaching operation, so studies were made of the bleaching of cottonseed oil with various adsorbents at different concentrations. Subsequent values of the iodine and peroxide values, Kreis, viscosity, F.F.A., and color were determined throughout the induction period, lasting until the oil became organoleptically rancid. The selection of proper adsorbents makes it possible to secure the benefits of the bleaching operation without loss in subsequent stability.

Activated carbons, natural and activated earths were the adsorbents used. Differences in stabilizing action were shown, certain products within each class being definitely better than others. To secure economic maximum bleaching and stability with the best quality, a carbon-earth mixture is desirable.