ABSTRACTS

Soaps

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Properties of Nascent Soap. Archibald Rayner. *Oil and Colour Trades Journal.* 85, 1157 (1934).—Nascent soap, i.e., soap formed in situ by combination of fatty acids and alkalies in articles which are being cleaned, has a greater detergency power than ordinary soap solution. Experiments show that seven grams of soap flakes in 1,500 c.c. of water or six grams of fatty acid were required to give results quickly to those obtained with 0.25 grams of oleic acid added to the cloth.

Since it is obvious that the application of dilute solutions of oleic acid in a solvent form cannot be used as a practical means of taking advantage of the increased detergency of nascent soap for ordinary washing, experiments were carried out on the use of an aqueous emulsion of oleic acid and subsequent dipping in a sodium carbonate or sesquicarbonate bath. It was found that by a suitable method of mixing, a permanent emulsion could be obtained which on diluting with warm water to give a fatty acid content of 0.2%, showed no visible separation of fatty acids for fifteen minutes. The ingredients found suitable for making this emulsion were: oleic acid 45%, sulphonated castor oil 5%, glue 1.5%, and water 48.

The activity of this emulsion was six times greater than the same weight of fatty acid used in the form of soap flakes.

Waxes as Soap-Making Materials. *Perfumery and Essential Oil Record,* 25, 5, 164 (1934).—The use of waxes, either liquid or solid, as soap-making materials hardly appears an economic proposition when one compares their prices with those of the ordinary soap-making fats and oils. There is further the difficulty that the wax alcohols liberated in the saponification process impair the washing and lathering power of the soap, so that these must be eliminated in order that the soap may be a salable article. In spite of this, however, various processes are from time to time recommended for the purpose.

A year or two ago the Deutsche Hydrierwerke A. G. of Charlottenburg, Berlin, patented (British Patent, 19912, 1931; "P. & E. O. R.," 1931, 358) a process for the conversion of sperm oil into commercial soap by hydrogenation, followed by treatment with solid caustic soda at 250-280° C., preferably in an autoclave. In this way the "unsaponifiable" wax alcohols are converted into fatty acids, or rather their soaps, and so increase the yield.

More recently two patents have appeared for the removal of the "unsaponifiable" matter (wax alcohols) by distilling it off from the anhydrous soap at a high temperature. The I. G. Farbenindustrie Akt. Ges. (British Patent 396769) saponify the wax by heating it to 200-300° C. with aqueous caustic potash or soda in an autoclave under a pressure of 10-30 atmospheres. By reducing the pressure steam escapes and the dry mixture is then heated to 310° C., if desired, in vacuo or in a current of steam or inert gas, whereby the unsaponifiable matter is distilled off. The residual soap is not salable as soap but is split with mineral acid and the fatty acids purified by distillation in vacuo or with steam; these are then suitable for conversion into soap in the ordinary way.

In British Patent 398807, Imperial Chemical Industries, Ltd., W. A. Sexton and D. Ward saponify waxes by heating them to 200° C. with dry powdered caustic potash or soda, or preferably a mixture of the two in equimolecular proportions. The temperature rises to 240° C. and is maintained at this point for 30 minutes, after which superheated steam is passed in, when the unsaponifiable matter distills over as a colorless oil. In the case of spermaceti this amounts to over 40% of the wax and sets to a waxy solid, whilst with sperm oil, yield is over 33% and it is only semi-solid on cooling. It is claimed that the process may also be used for Chinese wax, beeswax, wool fat and carnauba and other vegetable waxes.

Sea Water Soaps. *Perfumery and Essential Oil Record,* 25, 4, 131 (1934).—It has now been found, according to an invention by Deutsche Hydrierwerke A. G. (British Patent Specification 406,565), that excellent preparation for ordinary washing purposes, especially for household purposes, can be obtained by mixing together one or more salts of the reaction products of sulphuric acid on higher molecular saturated aliphatic alcohols containing more than eight carbon atoms with those of the reaction products of sulphuric acid on unsaturated higher molecular fatty alcohols. The preparations can be worked up and/or shaped in any suitable manner; for example, in a soap mill into various compact forms, such as tablets, ribbons, flakes, needles, vermicelli, or the like.

It is possible in this way to obtain hard pieces of high polish which are not only unaffected by the lime and magnesia salts of the washing water but which also lather excellently even in very salty water, especially sea water. This effect is achieved by homogeneously working up the neutralized sulphuric acid reaction products of higher molecular saturated fatty alcohols together with those of an unsaturated nature and then pressing or otherwise working or shaping them to pieces suitable for toilet use and the like.

New Synthetic Products with Soap-Like Properties. E. Lederer. *Angew Chem.,* 47, 119-25 (1934).—Commercial Igepon A and T pastes were examined for solubility in H_2O and organic solvents, density of aqueous solutions, viscosity, surface and interfacial tension, emulsifying action, foam number and foam consistency with and without the presence of electrolytes, and salting-out processes. The results are parallel to those obtained for soap solutions. The reduction of the surface tension of H_2O is far greater than in the case of equally concentrated soap solutions and the interfacial tension with oil is also reduced to a greater extent. The emulsifying action toward organic solvents in general is less than with soaps. Many experimental data are presented. Igepon A and T have the following compositions, respectively: Active substance 45, 33.5%; soap 4, 2.5%; salt 16, 8%; H_2O 35, 56%; molecular weight 412 and 425. The active substance in Igepon A and T consists of sulfonated products; in A the carboxyl group is modified by condensation and in T by amidation. (C. A. 28, 9, 2931, 1934.)

Evaluation of Foam-Producing and Wetting-Out Materials and Detergents, etc. Hetzer. *Chem.-Ztg.,* 57, 715-16, 735-6 (1933).—The effects on the foam test of variations in experimental technic and in fatty acids contents of the original oil are discussed. The foam values of soaps made from tallow are greater than those of soaps derived from palm-kernel oil or hardened oils, particularly if the air space in the shaking volume is large, and for constant results this should be a minute. Foam value decreases with an increase in the age of the solution up to 12 hours, when it becomes constant, this being partly accounted for by the longer duration of contact with air. To obtain constant results, 50 cc. of fresh sample is shaken 40 times in a 120-cc. cylinder at 20° and (or) 50°, and the percentage of foam is read at 1-minute intervals over 10 minutes. (C. A. 28, 9, 2932, 1934.)

New Determining Influences in Oil- and Fat-Spoilage. Th. Ruemele. *Seifensieder-Ztg.* 61, 125 (1934).— The action of light and the composition of the fatty acid mixture determine the speed in fat spoilage. Methyl oleate turns rancid more quickly than the mixed Me esters of oleic plus linoleic acid. The smaller the amount of linoleic and linolenic acids in a fat, the easier does it turn rancid. *(C. A. 28, 10, 3257, 1934.)*

Action of Carbon Dioxide Upon Soap Base. L. Lascaray. *Seifensieder-Ztg.* 61, 156 (1934).—Bergell's observation (cf. C. A. 28, 22059, 22093) that atmosphere CO_2 decomposes soaps during the drying process is correct. Soap is both a molecular and colloidal solution and during drying the molecularly dissolved portion becomes colloidal. The decomposition of solid soaps by CO_2 can be explained by the ready solubility of fatty acids in concentrated soap solution because the small amount of fatty acid which is liberated on the soap surface is strongly absorbed and held by the colloidal body of the soap, thus permitting a further decomposition of the soap. (C. A. 28, 10, 3260, 1934.)

New Shaving Soaps. *Oil, Paint and Drug Reporter.* 125, 23, 10, (1934).—A new principle has been used in making shaving soaps by a Hungarian inventor. According to his process, a reaction between an alkali and an ammonium soap is allowed to take place on the face, with water acting as a necessary catalyzer. This reaction is said to aid materially in the softening of the toughest beard.