ABSTRACTS

Soaps

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Floodlighted soap bubbles. Engineering Department, General Electric Company, Cleveland, Ohio. *General Electric Review,* Vol. 36, No. 10, page 458, October, 1933.—An innovation in display presentation is the colored floodlighting of a large number of gas-formed soap bubbles as they floated up and off through the air. The arrangement consisted of ten cans about two feet deep by 18 inches in diameter placed in a group in the center of a tennis court. A solution of ten parts of water to one part of a saturated solution of castile soap and water and ½ part of glycerine was placed in the bottom of each can to a depth of approximately 1½ inches. Experiments showed that castile soap produced the most colorful bubbles although ordinary soap worked satisfactorily. The glycerine strengthened the soap film and made the bubbles last longer.

Submerged in the water in each can was a length of ½ inch rubber tubing connected to an iron manifold having ten outlets, the manifold in turn being connected by a rubber hose to the gas supply which consisted of compressed hydrogen gas in tanks.

Floodlights with red, blue and green projections were placed at strategic points to cause the bubbles to change color as they drifted through one beam into the next.

Mahogany sulfonates in dry cleaning. *Chemical Industries,* Vol. 33, No. 4, page 327, October, 1933.—It is now possible to incorporate with dry cleaning solvent definitely controlled amounts of water, sufficient to bring about the removal of water spots and water-soluble stains, but insufficient to cause color bleeding, shrinkage or other troubles. This is done by means of mahogany sulfonates (in definite percentages), which absorb appreciable quantities of water without losing their solubility. By using these dispersing agents it is possible to produce clear dispersions of water in the solvent, ranging from a few tenths per cent to as much as 20 per cent water content. The power of these compounds to absorb water is increased by the addition of small amounts of alcohols or cresols.

Mahogany sulfonates are colloidally soluble in water, soluble in all proportions in oil, and either alone or mixed with oil have the capacity to absorb approximately their own weight of water and still retain their oil solubility. Stains caused by water or syrups can be completely removed by agitating the fabric with solvent containing from one to two per cent of a mixture made up of 50 per cent mahogany sulfonate and 50 per cent water. The concentration of water necessary depends on the nature of the goods under treatment, the ratio between weight of goods and weight of solvent and the nature and extent of the stains.

It is desirable first to remove the greater portion of oily and greasy stains before the treatment with the solvent containing water. These sulfonates also possess the added advantage of lowering the interfacial tension between gasoline and water to a much greater degree than fatty acid soap mixtures, permitting solvent by the material under treatment, which always contains moisture. They also decrease the surface tension of the solvent and prevent the formation of static charges.

Mahogany sulfonates are produced commercially as by-products of the operation of refining petroleum to produce medicinal white oils or light-colored technical oils, by treating the petroleum or fractions of it with fuming sulfuric and/or sulfur trioxide.

Detergency of alkaline salt solutions. Foster Dee Snell. *Industrial and Engineering Chemistry,* Vol. 25, No. 11, page 1241, November, 1933.—Experimental washing by a modified Rhodes and Brainard procedure gives reproducible results in the same laboratory. A soap builder alone is primarily a detergent only to the extent that it can react with free fatty acid in the soil to produce soap. Secondarily it may be effective because of improved wetting power of the detergent solution. One of the important functions of a soap builder is to speed up detergency. This may be expressed as a measure of the rate of removal of soil. Under specific conditions with low acidity of the soil, 0.1 per cent each of soap and soda ash is less efficient than 0.1 per cent soap alone, and 0.1 per cent each of soap and metasilicate is more efficient than 0.1 per cent soap alone. This cannot be expected to hold for all acidities of the soil.

It is desirable that the hydroxyl-ion concentration of the builder solution be relatively large and the sodium-ion concentration relatively small.

Based on several factors, the order of decreasing value as detergents of the builders studied is: sodium orthosilicate, sodium metasilicate, a mixture of sodium metasilicate and soda ash, sodium hydroxide, modified soda, and soda ash. The behavior of colloidal soap builders is clearly distinguishable from that of non-colloidal soap builders. Acidity of dirt increases the ease with which it is removed.

The theory is advanced that the efficiency of the different builders with soap is some positive power of the number of units of brightness regained in washing. It is estimated as not less than the second, or greater than the third power. The major factors in detergency are mechanical action, wetting power, deflocculating power, and emulsifying power, the latter two possibly appearing under another name. The data are in agreement with the micelle theory of detergency.

The detailed data presented here are on builders and soap in one ratio. When similar data in other ratios become available, whether from this or other laboratories, practical results in the laundry will be predictable with much greater certainty.

Detergent developments. R. A. Duncan. *Oil, Paint and Drug Reporter,* Vol. 124, No. 20, page 30A, November 6, 1933.—For many generations soap has been our standard detergent, but it has at least two serious limitations. It can not be used except in neutral or alkaline solutions; as acid decomposes soap giving free fatty acids which have no detergent value; and it forms insoluble soaps with the heavy metal salts found in practically all natural waters. These objections are both overcome by the use of sodium alkylsulphates, the alkyl group being of the range of C_{12} to C_{18}. These products are typical of a group which are resistant to the effect of acid in moderate concentrations and which form soluble salts with the alkaline earth metals and the more common metals. They prevent the formation of any scum or slime such as is formed by soap in hard water, but since the heavy metal alkyl salts are also good detergents, there is no loss in efficiency.

Fatty acids for soap-making. *Perfumery and Essential Oil Record,* Vol. 24, No. 10, page 363, October 24, 1933.—Apart from the use of high-grade stearine for shaving soap, and of cotton stearine for soap-powders, fatty acids are not commonly employed in this country for soap-making. On the Continent and in America, however, they are much more popular, and the greater proportion of the acids is made by the Twitchell or "kontak" process of hydrolysis, in which before treatment with the reagent, the oil or fat is subjected to a preliminary wash with sulphuric acid. Recent research has done much to explain the necessity for this preliminary acid wash. Thus, Trusler ("Oil and Fat Ind.," 1931, 141 and 157 from an examination of the Twitchell process, concluded that the resistance to hydrolysis evinced by cottonseed and certain other oils was due to lecithin or related substances, and more recently, Royce and Lindsay ("Ind. Eng. Chem.," 1933, 1,047) from an exhaustive examination of gossypol, separated from cottonseed oil, consider that this substance is even more responsible than lecithin for the hydrolysis-resisting property of cottonseed oil. It is concluded in each case that the hydrolysis-inhibiting substance or substances (termed by Trusler "antihydrols") are removed or inactivated by treatment with moderately concentrated sulphuric acid, and hence the need for the initial acid treatment in the usual Twitchell process.

A crude cottonseed oil may contain as much as 0.1 per cent of gossypol, which is also a strong anti-oxidant, thus explaining the better keeping qualities of dry filtered crude oil over a refined cotton oil from which the gossypol has been removed.

Hydrogenated soap stock and lather value. *Perfumery and Essential Oil Record,* Vol. 24, No. 10, page 364, October 24, 1933.—One of the chief obstacles to the more extended use of hydrogenated fat as a substitute for tallow in soap-making, has always been the poor lathering qualities of soap made from hydrogenated fat, and the maximum amount that may be safely used is generally regarded as not exceeding 15-20 per cent of the total fat charge. Knigge (Seifen. Zeit., 1933, 265) has recently published the results of some experiments on the lathering power of soaps made from stock consisting of 10 per cent coconut oil, 20 per cent ground-nut oil and 10 per cent resin, the remaining 60 per cent being made up of tallow and hydrogenated fat. Measurements of the amount of lather were made with Stiepel's apparatus, on solutions of these soaps containing exactly 0.3 per cent of fatty acids, and readings taken after 3, 10 and 15 minutes, two series of tests being made, at 20° C. and 50° C. From the results it is concluded that for toilet soaps the amount of hydrogenated fat should not exceed 10 per cent and for laundry soaps the maximum amount permissible is 20 per cent.