ABSTRACTS

Soaps

Edited by **M. L. SHEELY**

Soap Flakes. *Soap, Perfumery, Cosmetics,* **10,** 132 (1937). Flakes may be tinted. If marketed white, nonoxol and beta naphthylamine are recommended as antioxidants. The finished flakes before packing should show a moisture content of at least 7%. Castor oil, sugar and glycerin will promote suppleness. The soap rolls should run rather warm, to impart a high polish to the flakes.

When the flakes are made to curl slightly, they do not pack in the containers. This curl is effected by careful adjustment of the roll temperature. As the skin of soap runs round on the last roll it naturally dries a little on its outer surface. The contraction thus produced gives rise to a state of tension in the soap, and on leaving the rollers, the duller upper surface continues to lose water more rapidly than the highly polished under side. As a result the flakes curl. A suggested lower limit for size of soap flakes is 2/1000 inch. A good average thickness is about 2.5/1000 inch.

The particular proportions of a mixture of fats which will give a soap of maximum solubility are those that give a mixed fat of lowest titre. Experiments show that the addition of groundnut oil produces considerable drop in lowering is produced at between 30 to 40% groundnut fatty acids.

New Developments in Laundering. *Chem. Industries* **40,** 144 (1937). Recent developments in the laundering of textiles which are not yet generally accepted, but which show definite promise are:

(1) The use of complex metaphosphates to dissolve accumulations of hard soaps.

(2) The use of persulfates and hydrogen peroxide instead of hypochlorites in the bleaching operation.

(3) The use of coagulation inhibitors to permit the removal of albumins at a higher temperature with increased efficiency.

(4) The use of "wetting out agents" such as the pine oil alcohols to increase the speed and efficiency of the penetration of the textile by the detergent.

(5) The use of the alkali metal salts of certain long-chain alkyl sulfonic acids and alkali metal salts of long-chain alcohol sulfuric acid. These detergents may be used in the presence of salt and at pH's around neutral. This diminishes the leaching out of dyestuffs and preserves the color of fabrics through more cycles of laundering. "Washing of Textiles," by Robert S. Shane (J. Chem. Ed., **13,** 564).

Fatty Acids from Pine Wood. *Soap* **13,** No. 3, 31 (1937). Since there is a shortage of fats, oils, and fatty acids in this country, pine wood oil may prove an invaluable substitute for these products in the future. This oil is a fluid blend having many characteristics of unsaturated fatty acids and is most frequently used as a substitute for red oil. In some cases, it is also offered as a substitute for semi-drying oils, although it is acid in character. The potential annual U. S. production of crude pine oil is 150,000,000 to 200,000,000 lbs. Tall oil, as it is called, has been used in Europe for some years. In the manufacture of bar soap, pine oil has there substituted for fatty acids up to 20%. It is also used in liquid soap, soft soap, soap pastes, scrub soaps, and textile scouring soaps because of its emulsifying power, although it has a tendency to soften the soap unless added alkalis are present.

Pine wood oil is normally recovered during the manufacture of paper pulp. The wood is cut into small chips and these are then poured into a steel pressure vessel and steamed under pressure with a soln. contg. caustic soda and other chemicals. The fats and resins in the pine wood are saponified and dissolved out during cooking of the wood chips and are present in the waste liquor as soaps. The first step is to reclaim chemicals from waste liquid by evaporation. The liquid gradually becomes more concentrated until the soaps become insoluble. The soap curds are skimmed off and are converted into a free acid state. Distillation will improve the quality of the oil but lowers the yield and tends to cause crystallization of the oil.

Pine wood is said to contain 3 classes of compns.: (a) rosin acids, (b) fatty acids, (c) non-acids, such as sterols, higher alcohols and other unsaponifiable matter. The American distilled product has an acid number of 164, an iodine number of 117, 35% rosin acids, 50% fatty acids, and 15% non-acids. There is only one refiner in the United States at this time. The oil is free from excise taxes.

The Significance of Chemical Research in the Production of Soaps and Washing Agents. H. P. Kaufmann. *Fette u. Seifen* **43,** 178-83 (1936). The part played by analytical and synthetic chemistry in developing modern washing agents is reviewed. The immediate problem for German chemists in this field is the prepn. of fat substitutes from the higher paraffins, especially by oxidation. (*Chem. Abs.*)

Notes on Dry Cleaning—Methods of Increasing the Detergent Effect of Dry Cleaning. C. L. Bird. *J. Soc. Dyers, Colourists* **52,** 456-8 (1936). Dry cleaning removes dirt and the dust adhering to it, leaving ingrained dirt and stains almost untouched. A dry-cleaning soap contg. a relatively high percentage of water is desired for cleaning suits, but only small quantities of water can be introduced in this way. A patented process is outlined which is based on this principle. Mahogany sulfonates, by-products of petroleum refining, are sol. in dry cleaning solvents and the solns. will dissolve a limited quantity of water. The nascent soap process, involving the making of the soap in the cleaning soln., is applicable to dry cleaning and it is possible to combine this process with the addn. of water. The chlorinated hydrocarbons are regarded as standard cleaning solvents but all have certain undesirable properties, such as corrosive action on machines, toxicity or tendency to dissolve certain dyes. Red cellulose acetate rayon dyes are most liable to bleed in $CHCl:CCl_2$. $CCl_2:CCl_2$ appears to possess the advantages of $CHCl:CCl_2$ without its solvent action on the cellulose acetate rayon dyes. (*Chem. Abs.*)

The Chemistry of Wetting-Out Agents. *Oil Colour Trades J.,* **91,** 687 (1937). Fatty acid salts were the original type of wetting agent, and their stability in hard water, solubility and wetting power can be changed by alternations in the chain length, introduction of dou-

ABSTRACTS

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ble bonds, by the formation of amine salts and by sulphonation. The importance of solubility and balance is discussed.

The inherent disability of the soaps, namely, precipitation of lime, can be largely overcome by blocking the carboxylic acid group by amidation, esterification or reduction to the alcohol. The introduction of a sulphonic acid group is a method applicable to compounds containing a double bond, aromatic ring or halogen atom; alcohols can be esterified with sulphuric or phosphoric acids, or organic acids containing solubilizing groups—citric and sulpho-acetic acids. Amine compounds include an important group of wetting agents. Straight-chain and cyclo-aliphatic amines are stable in hard water, while many quaternary ammonium salts are effective in acid, neutral or alkaline solutions. Cyclic amines, iminazoles, thicazoles or oxazoles form the basis of other agents. Mercaptans and phenols can replace the normal alcohols in many cases and sulphurated petroleum fractions are well known and contain no carboxyl group. Ethers, too, are employed, and have the advantage of insensibility to alkali; the related acetals and the condensation products of aldehydes and amines have recently been utilized.

Some Aspects of the Action of the Newer Detergents. *Oil Colour Trades J.* **91,** 689 (1937). This paper included a brief account of the factors involved in detergent action and descriptions of the composition and properties of certain of the newer detergents.

Ease of removal of dirt depends upon the nature of the detergent, the nature of the surface to be cleaned, the nature of the dirt or soil, the nature of the water employed, the nature of the agitation, and, in addition, in any detergent operation regard must be paid to the possible effects of the detergent solution upon the surface being cleaned, and also the person of the user. It has not been found possible to correlate accurately the efficiency of a detergent solution with any single property of that solution, such as capacity for reducing the surface tension against air or against oil, etc. For the evaluation of detergent efficiency an actual detergent test with soiled material seems to be essential. In actual practice with cloth it is usually possible to remove the bulk of the dirt by agitation of the cloth in the detergent solution; some spots of tenaciously held dirt may require rubbing, whilst stained material, such as tea and coffee stains, etc., may require a bleaching agent for their complete removal.

The types of the newer detergents taken for consideration are the Igepons, Gardinols and polyglycerol esters. The capacities of solutions of these detergents for reducing the surface tension against air or against oil, and also their washing properties on soiled cotton and woolen materials, are described. In addition, figures are given illustrating the comparatively small amount of fatty matter deposited by these detergents on cloth in hard water, and, finally, the results of some tests are described on the washing action of these newer detergents in solution of different pH values and also at different temperatures. As might be expected from the composition of the detergents in relation to the composition of wool, the washing efficiency of a polyglycerol ester is less affected by variations in pH value than that of either Igepon or Sapamine, and, further, the washing efficiency of Igepon on soiled flannel is better at low and medium temperatures than high temperatures.

PATENTS

New Detergents. Ger. Pat. 638,302. I. G. Farbenind. A. G. The use of the sulphonates of higher alcohols as soap substitutes is not limited to powders, pastes, or solutions, but, according to the present invention, may be extended also to bars or cakes. The various materials are the sulphonates of octyl-, lauryl-, catyl-, and other higher alcohols, and the finished products are in some cases claimed to be superior to ordinary soaps. The alcohols may be conveniently obtained by hydrogenating fatty acids or animal and vegetable oils, and then sulphonating by means of one of several methods with sulphuric acid, oleum, or the like, with or without solvents. Suitable salts of such sulphonated products are those of sodium, potassium, ammonium or of organic amines such as methylamine, diethanolamine, pyridine, etc. Various additions may be made and the products obtained finally in bar or cake form, suitable both for toilet and household purposes. (*Soap, Perfumery Cosmetics* **10,** 150).

Neutral or Acid Cleansing Agents. Brit. Pat. No. 459,039 consists in the manufacture of washing agents and detergents of neutral or acid reaction by mixing a water-soluble salt of an aliphatic carboxylic acid containing an aliphatic radical of high molecular weight which is linked to the carboxyl group through at least one nitrogen atom, but not through an oxygen atom, with a compound of acid reaction such as, for instance, sodium bisulphite, boric acid, citric acid, tartaric acid, or oxalic acid. As salts of aliphatic carboxylic acids of the kind in question there may be mentioned, for instance, the alkali salts of cotadecylenylamino-acetic acid having the formula:

$$C_{18}H_{35}.NH.CH_2.COOMo$$

and alkali salts of analogous carboxylic acids; furthermore, the alkali salts of oleyl sarcoside and of coconut fatty acid sarcoside having the formula:

$$\begin{array}{c} CH_3 \\ | \\ R.CO.N—CH_2.COONa \end{array}$$

Wherein R.CO—stands for oleyl or the acyl radicals of the fatty acids of coconut oil, and homologous bodies.

The cleansing agents thus obtained are neutral or acid and are very suitable for cleaning textiles sensitive to alkalis, for cosmetic purposes, for instance, in the form of neutral toilet soaps, and for tooth pastes, hair-wash or the like. (*Perfumery Essent. Oil Record,* **28,** No. 2, 76.)

Stabilizing Animal and Vegetable Fats and Oils. U. S. 2,063,602, Dec. 8, 1936, James K. Hunt and Geo. H. Latham (to E. I. du Pont de Nemours & Co.). Deterioration of cottonseed oil or other oils or fats during storage is inhibited by adding about 0.1-1.0% of a sugar amine compd. such as methyl glucamine. Numerous examples are given. (*Chem. Abs.*)