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SOAP PRODUCT CONTAINING GUANIDINE STEARATE

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This invention relates to a soap product comprising guanidine stearate.

The word "soap" is used herein to refer to alkali metal salts of the fatty acids and/or rosin acids and mixtures of the same. The expression "soap product" is used herein to refer to a composition comprising soap as the primary ingredient but also including small amounts of other ingredients in admixture with soaps, such as antioxidants, coloring materials, perfumes, water, glycerine, and ingredients to modify or enhance the detergent action of the soap.

Guanidine stearate is a known compound and can be made, for example, by the interaction of guanidine carbonate and stearic acid. The method of making it, however, forms no part of the invention. Guanidine salts of fatty acids per se are also known to have dispersing, emulsifying and wetting properties, but inasmuch as guanidine stearate is relatively insoluble in water of ordinary temperaures it is not as desirable for use per se as is guanidine laurate or guanidine myristate which have better solubility characteristics.

It has been discovered in accordance with the invention that the addition of guanidine stearate in moderate amounts to ordinary soaps results in a soap product having novel and desirable characteristics, particularly a soap product of improved apparent solubility rate and also increased detergency but retaining the mildness of the original soap.

In preparing the composition of the invention, the guanidine stearate may be separately formed, and then added to or compounded in the soap in any stage of its manufacture, preferably, however, after the soap has been formed and removed from the soap kettle. The guanidine stearate may be incorporated, for example, during the crutching, plodding, milling, converting, or other operations to which the soap is subjected, and which would result in the uniform admixture of the guanidine stearate with soap. Ingredients ordinarily added may also be included.

The amount of the guanidine stearate to be added to the soap may vary from about 1 to 15% by weight, depending upon the nature of the soap and the properties wanted in the final product. The use of 5% by weight results in a good effect. In general, amounts above 10% by weight do not appear to improve the properties to such an extent as to justify the use of greater amounts.

One of the novel properties of the soap product containing guanidine stearate in accordance with the invention is its enhanced apparent solubility rate. As indicative of the improvement in this respect, an unfilled milled flake soap, such as recommended for washing woolens and fine clothing, was compared with identical soap in which 5% by weight of guanidine stearate has

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been incorporated. The following table shows the relative apparent solubility as determined at different temperatures by standard washability laboratory tests:

Table I

Temperature	Apparent Complete Solubility Rate	
	Regular Unfilled Milled Soap Flakes [1]	Same Soap Containing 5% by Weight Guanidine Stearate
90° F.	35 sec.	29 sec.
80° F.	7 min.	2 min.
75° F.	Not in 10 min.	3½ min.

[1] Contains potash soap.

This improvement in solubility is indeed surprising because guanidine stearate itself is not appreciably soluble except in water much hotter than 90° F.

While improved solubility of soaps can be obtained by the inclusion of a larger amount of potassium soaps and by the use of softer oils, i. e., glycerides of unsaturated fatty acids or saturated fatty acids of lower molecular weights, it is often undesirable for economic reasons to resort to these ingredients in a soap product. The ability to obtain enhanced solubility by the inclusion of guanidine stearate appears to surpass the solubilizing effect of potash soaps to a striking extent as can be seen from the above table.

Another property of the soap product of the invention is its superior detergent action as reflected in its property of accomplishing a larger amount of washing with a given amount of soap product. This may be demonstrated by a standard dishwashing test in which standardized soiled plates are washed in water containing a given amount of the soap product, and the number of such soiled plates that may be washed before the water loses its detergent or washing action is determined. A comparison of the same regular unfilled milled flake soap product, with the same product containing 5% by weight guanidine stearate in accordance with the invention, is shown in the following table:

Table II

Grams of soap per 6 qts. of 300 P. P. M. hard water	Number of Soiled Plates Washed	
	Regular Unfilled Milled Soap Flakes	Same soap Containing 5% by weight Guanidine Stearate
23.5	35	50

From the above table it will be seen that the num-

ber of plates that may be washed with the soap product of the invention is materially greater than can be washed with an ordinary soap.

Although somewhat similar results could be obtained by including a builder, such as tetrasodium pyrophosphate, the use of guanidine stearate to enhance the detergent properties of the soap has a number of advantages. The fact that guanidine stearate itself is similar to a soap in that it is derived from a fatty acid would permit its use in a pure soap product as distinguished from the so-called built soaps. Furthermore, the guanidine stearate may be readily incorporated in milled flakes, whereas the use of an inorganic salt, such as a phosphate, tends to make the soap "short," so that the milling operation is more difficult and the resulting flakes are more brittle and tend to break or dust more readily.

Another advantage of a soap containing guanidine is its mildness in comparison with its detergency. While this detergency can be obtained with inorganic soap builders, such as the phosphates, it is generally conceded that the presence of such builders increases the irritating effect upon more sensitive skins. The mildness of the guanidine stearate soap is indeed surprising since guanidine itself is a strong base.

A soap product containing guanidine stearate in accordance with the invention has the additional advantage in that less scum or sediment is formed with hard water, particularly in a rinsing operation. Under these conditions the presence of the guanidine stearate helps to maintain the insoluble calcium and magnesium soaps in a dispersed state and minimizes scum.

The unique characteristic of the guanidine stearate-containing soap is also confirmed by the fact that guanidine laurate and guanidine myristate, while about equal in sudsing and detergent properties to the corresponding sodium laurate and sodium myristate have little effect in improviding the properties of ordinary soap. This may be seen from the following table in which soiled plates were washed in the same manner as that described previously except that the soaps contained guanidine laurate and guanidine myristate respectively instead of guanidine stearate:

Table III

Grams of soap per 6 qts. of 300 P. P. M. hard water	Number of Soiled Plates Washed		
	Regular Unfilled Milled Soap Flakes	Same Soap Contained Guanidine Laurate	Same Soap Containing Guanidine Myristate
23.5	34	33	27

From the above table it will be seen that the guanidine laurate and myristate do not improve the detergent properties. This might be expected in view of the known properties of the guanidine laurate and myristate when used alone. The stearate, however, is so insoluble as to be of little use by itself. The fact that it would improve the properties of ordinary soaps is a result entirely unexpected and unpredictable from the action of guanidine stearate alone.

The soap product containing the guanidiine stearate may be in any form, such as cake or bar form, in flake form, or as a powder, spray dried particles, threads, ribbons, sheets, and other forms.

In general, the improved properties are not so noticeable in a filled or built soap. The presence of the inorganic electrolyte builders in these soap products is believed to interfere somewhat with the action of the guanidine stearate in the soap product.

The invention assumes particular importance in connection with improving the properties of an all-soap product of the unfilled and unbuilt type, especially when in flake form, where mildness is a desirable property both with reference to the materials being washed and the skin of the user, but which soap nevertheless is to be readily soluble and possess an enhanced detergent action.

It will be obvious that the invention includes many variations in the manner in which the guanidine stearate may be incorporated in the soap and the form and constitution of the soap product. All such variations are obvious to those skilled in the art of making soap and are intended to be included within the invention if they fall within the following claims.

I claim:

1. A solid, all-soap product for washing with water, consisting essentially of an unfilled alkali metal soap and 1 to 15% by weight of guanidine stearate.

2. An unfilled, milled, white soap product in flake form for washing with water, consisting essentially of an alkali metal soap uniformly admixed with 1 to 15% by weight of guanidine stearate.

3. An unfilled, milled, white soap product in flake form for washing with water, consisting essentially of an alkali metal soap uniformly admixed with about 5% by weight of guanidine stearate.

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