

1

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DETERGENT BAR

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ABSTRACT OF THE DISCLOSURE

A soap bar which may contain non-soap detergent in combination with selenium disulfide is stabilized with an effective amount up to 35% of dicalcium phosphate.

The present invention relates to soap and soap-synthetic detergent bar compositions and more particularly to bar compositions containing selenium disulfide.

The effectiveness of selenium disulfide as an agent for treating skin disorders, such as dandruff, has been known for many years. Problems have been recognized in obtaining suitable composition containing the selenium disulfide so that it may be applied in an effective manner. U.S. Patent No. 1,860,320, describes an attempt to provide a suitable solid composition by combining the selenium disulfide with bentonite. Subsequent thereto, the art moved away from solid compositions and instead incorporated the selenium disulfide in creams and shampoos.

In accordance with the present invention, a solid soap bar containing between 2% and 25%, and preferably between 5% and 15% water and between 0.1% and 5%, and preferably between 1% and 2.5% of selenium disulfide, is provided. The bars may be provided as toilet soap bars or as abrasive bars. In accordance with a preferred embodiment of this invention, the bars also contain up to about 35%, and preferably between 20% and 30% of dicalcium phosphate.

The solid bars of the present invention are usually and preferably formed from the alkali metal salts of higher fatty acids, e.g., the sodium salts of fatty acids having 8–22 carbon atoms and preferably 12–18 carbon atoms, such as sodium stearate, sodium laurate, sodium oleate, etc. Potassium salts may be employed provided that the finished bar is of suitable hardness and acceptable solubility. Amine and ammonium soaps may find limited application as minor constituents of the soap mixture. The fatty acid portion of the soap may be a mixture of saturated and unsaturated acids obtained from the usual soap-making fats such as coconut oil and tallow or maybe a relatively pure fatty acid or mixture such as commercial stearic acid. In either case, polyunsaturated acids will be held to a minimum. The preferred soaps are those predominantly sodium base soaps prepared from mixtures of substantially saturated fatty acids derived from tallow and from coconut oil and their hydrogenated materials. The preferred soap making compositions are those that contain a ratio of coco to tallow derived fatty acids from about 1:9 to 1:1.

The solid bars of the present invention may contain up to about 60% of a synthetic detergent, although it is preferred that soap comprise the major portion. Broadly speaking, the soap-synthetic detergent bars may contain 10–60% of soap and 10:60% of synthetic detergent. For most purposes, and generally when using above about 10% of synthetic detergent, the synthetic detergent should be a water-soluble solid. Preferred detergents include the sulfated fatty alcohols, particularly those containing about 10 to 22 carbon atoms. Other suitable detergents include

2

the water soluble higher fatty mono-glyceride mono-sulfates, and broadly the class of solid detergents designated as water-soluble salts of organic sulfonic acids and of aliphatic sulfuric acid esters.

5 Theseelenium disulfide is available in the form of fine particles. A very fine commercial grade averages between 5 and 20 microns and a coarser commercial grade averages between 50 and 200 microns. These fine particles, usually in suspension in a liquid, are added to the soap
10 or soap-synthetic detergent components of the desired bar during the mixing step. The selenium disulfide is uniformly incorporated into the soap. It does not affect the color or appearance of the soap. However, it has been found that when bars containing selenium disulfide are heated in an oven for several hours or when aged at room temperature for long periods of time there is a tendency for discoloration to appear. When using coarse selenium disulfide
15 particles, this may be taken advantage of to form a bar having a speckled purplish appearance. This discoloration is prevented by incorporating in the bar, an effective amount of dicalcium phosphate (CaHPO_4). The anhydrous dicalcium phosphate is preferred. The hydrated form is also effective, although slightly higher levels are required. When discoloration is to be avoided, the bars
20 should contain between about 20% and about 35% of the dicalcium phosphate. Those bars containing between about 20% and 30% are preferred. The dicalcium phosphate available may be of sufficiently coarse size that the bar has mildly abrasive characteristics. These are desirable in combination with the therapeutic effect of the selenium disulfide in application to the skin.

The bars may, and usually will, contain several optional ingredients such as perfumes, preservatives, pigments, emollients, antiseptics, sequestering agents, antioxidants, stabilizers, fillers, and abrasives. Illustrative commonly
35 used optional ingredients include menthol, stannic chloride solution, long chain liquid organic phosphates, hexachlorophene, trichlorocarbonyl, insoluble sodium metaphosphate, zinc chloride, lanolin, titanium dioxide, and hydrated alumina (an abrasive).

The selenium disulfide is readily and uniformly incorporated in the soap mixture (or soap-synthetic detergent mixture) at the time the bar-forming components are mixed. The basic soap may be supplied as the dry soap chip and the remaining ingredients including the desired amount
45 of water added. Alternatively a wet mixture of the ingredients may be mixed and dried to the desired water content. The mixed components are then placed in the hopper of a soap mill which contains at least three rolls and processed through the mill at least three times producing a ribbon. The ribbon is processed in a soap plodder, and extruded, cut into lengths and pressed into cake form. Although it is preferred to employ the soap making equipment and the procedures described, other forming apparatus
50 adapter to compress homogeneous particles of the present formulae may also be employed providing only that the bar obtained is of uniform composition and structure. Plodding, milling and drying temperatures should be regulated for optimum performance in the manner well known to those skilled in the art.

The following examples are given to illustrate the invention. All amounts and percentages in the specification and the claims are by weight unless otherwise indicated. The
55 given weights, percentages and proportions of the components are exclusive of impurities and by-products often present in the commercially available substances.

The bars of the examples were prepared by hand mixing the solid soap chips and the other solid ingredients, such as the selenium disulfide and alumina. The liquid components, such as the perfume, the preservative and the added water, were springled individually over the surface of the

3

mixed solids. The entire mass was then mixed with spatulas and when thoroughly mixed placed in the hopper of a three-roll soap mill and passed through the mill to produce ribbon. These were hand mixed and returned to the hopper twice, to obtain a total of three passages through the mill. The mill was at ambient temperatures. The ribbon products of the mill were then passed twice through an extrusion plodder. The extruded strips of soap were cut into lengths suitable for insertion into a die in a press, inserted into the die and pressed into bars.

Example 1

A bar was prepared from the following components:

	Parts
Sodium soap 50 coco/50 tallow) (622 parts anhydrous) -----	644
CaHPO ₄ (anhydrous) -----	150
Insoluble sodium metaphosphate -----	50
Trichlorocarbaniide -----	5
Perfume and preservative -----	13.5
Selenium disulphide -----	10
Water (added) -----	128

Example 2

A bar similar to that of Example 1 and containing 25% of dicalcium phosphate, was found to provide a bar which was very mildly abrasive:

	Parts
Sodium soap (50 coco/50 tallow) (anhydrous) --	52.15
CaHPO ₄ (anhydrous) -----	25.00
Insoluble sodium metaphosphate -----	5.00
Trichlorocarbaniide -----	0.50
Perfume and preservatives -----	1.35
Selenium disulphide -----	1.00
Water (added) -----	15.00

Example 3

Another abrasive bar was prepared from the following components:

	Parts
Sodium soap (50 coco/50 tallow) (522 parts anhydrous) -----	535
Hydrated alumina -----	250
Selenium disulfide -----	10
Insoluble sodium metaphosphate -----	50
Trichlorocarbaniide -----	5
Perfume and preservative -----	13.5
Water (added) -----	137

Example 4

The following components are mixed and processed to form a bar:

	Parts
Sodium soap (50 coco/50 tallow) (840 parts anhydrous) -----	932
Selenium disulfide -----	10
Water (added) -----	58

Example 5

The following components are mixed and processed to form a bar:

4

	Parts
Sodium soap (85 coco/20 tallow) -----	350
Sodium lauryl sulfate -----	350
Dicalcium phosphate -----	200
Zinc chloride -----	40
Selenium disulfide -----	15
Water (added) -----	45

Example 6

A sound, stable, abrasive selenium disulphide containing bar was prepared from the following components:

	Parts
Sodium soap (80 coco/20 tallow) (anhydrous) --	63.67
CaHPO ₄ (anhydrous) -----	9
Hydrated alumina -----	11
Lanolin (anhydrous) -----	1
TiO ₂ -----	1
Perfume and preservative -----	2.25
Insoluble sodium metaphosphate -----	0.2
Selenium disulphide -----	1
Water (added) -----	10.88

The soap bars of the present invention are applied to the body, e.g., the scalp, as a lather and the lather may be allowed to remain for several minutes in contact with the body, and then rinsed off leaving a desirable cleansing effect on the hair and scalp.

As many embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that the invention includes all such modifications and variations coming within the scope of the appended claims.

What is claimed is:

1. A detergent composition in bar form consisting essentially of 10 to 60% of a solid water soluble alkali metal salts of the higher fatty acids, between 2% and 25% water, between 0.1% and 5% of selenium disulfide in homogeneous dispersion in said bar, and sufficient up to about 35% of dicalcium phosphate effective to prevent discoloration of the bar when aged at room temperature for periods of time.

2. The detergent bar of claim 1 containing between 5% and 15% water and between 1% and 2.5% of selenium disulfide.

3. The detergent bar of claim 1 containing between 20% and 30% of dicalcium phosphate.

4. A detergent composition in bar form as defined in claim 1 which contains from 10 to 60% of at least one water soluble anionic synthetic detergent.

5. The detergent composition of claim 4 containing between 5% and 15% water.

6. The detergent composition of claim 5 containing between 1% and 2.5% selenium disulfide.

7. The detergent composition of claim 6 containing between 20% and 30% of dicalcium phosphate.

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