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DETERGENT BAR CONTAINING FATTY KETONE

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8 Claims. (Cl. 252—161)

This is a continuation of application Ser. No. 42,499, filed July 13, 1960, now abandoned.

The present invention relates to detergent bars prepared from synthetic non-soap sulfated organic detergents which contain a saturated straight chain higher alkyl radical. More particularly, the invention relates to such detergent bars which contain a fatty ketone, and to a process for the preparation thereof.

In accordance with the present invention, a detergent bar consists essentially of about 50 to 99% of a sodium salt of a sulfated organic detergent containing a saturated straight chain alkyl radical having from about 12 to 18 carbon atoms, about 0.5 to 10% by weight of a fatty ketone selected from the group consisting of stearone and palmitone, and adjuvant fillers as a balance. Also within the scope of the invention is a process for the preparation of an extruded detergent bar which comprises commingling about 50 to 99 parts of solid particulate water-soluble sulfated organic detergent salt containing a saturated straight chain higher alkyl radical having from about 12 to 18 carbon atoms with about 0.5 to 10 parts by weight of a fatty ketone selected from the group consisting of stearone and palmitone, heating the mixture to a temperature in the range of about 47 to 65° C. and forming a homogeneous plastic mass thereof, and extruding said plastic mass in the form of a bar.

The sulfated organic detergent salts of the present detergent bars are well known to the art, examples of preferred embodiments thereof being sulfated esters of saturated straight chain fatty materials containing from 12 to 18 carbon atoms such as the water-soluble salts of higher alkyl sulfates prepared by sulfating higher fatty alcohols including higher alkyl terminal sulfates such as sodium lauryl sulfate and sodium cetyl sulfate, and monosulfated higher saturated fatty monoglycerides such as the sodium salt of coconut oil monoglyceride monosulfate and the sodium salt of tallow monoglyceride monosulfate, and mixtures thereof. Other suitable sulfated detergent salts include the water-soluble salts of monosulfated ethoxylated fatty alcohols such as the sodium salt of the monosulfated product of condensation of three moles of ethylene oxide with the fatty alcohols obtained by reduction of tallow fatty acids. The saturated straight chain higher alkyl radicals of the sulfated detergent may be derived from naturally occurring mixtures of fatty materials, or from other natural or synthetic sources, and although the cation of the detergent salt normally is sodium in view of its ready availability and low cost, other compatible water-soluble salts may replace the sodium salt in whole or in part if so desired.

The instant fatty ketones are selected from the group consisting of stearone (18-pentatriacontanone) and palmitone (16-hentriacontanone). These ketones normally are used in an amount equal to about .5 to 10% by weight

of the final bars, and the aforesaid sulfated detergent salt will normally constitute about 50 to 99% thereof the balance of instant detergent bars, i.e., from 0 to 49.5% thereof, being adjuvant filler. In a preferred formulation, the same proportions of ketone and filler are combined with about 40 to 70% sodium salt of a sulfated monoglyceride of a saturated higher fatty acid containing from about 12 to 18 carbon atoms and about 10 to 35% of a sodium salt of a saturated higher fatty alcohol containing from about 12 to 18 carbon atoms.

Suitable adjuvant fillers include a wide variety of organic and inorganic substances including surface active materials such as higher fatty alcohols, e.g., cetyl or hydrogenated tallow alcohol, hydrotropic agents such as sodium toluene sulfonate and sodium xylene sulfonate, inorganic salts including strong electrotytes such as sodium chloride, potassium chloride, sodium sulfate, magnesium sulfate, phosphate salts such as trisodium phosphate, tetrasodium pyrophosphate, and pentasodium tripolyphosphate, starch, lecithin, bentonite, organic sequestering agents such as tetrasodium ethylene diamine tetracetic acid, germicides and bactericides such as hexachlorophene, coloring agents, fluorescent dyes, perfumes, lanolin, lanolin alcohols, higher fatty acid-monoalkanolamides and dialkanolamides, such as lauric monoethanolamide and the diethanolamide of coconut oil fatty acids, fatty acid monoglycerides such as glycerol monococate, glycerol esters such as diethylene glycol monostearate, sulfonated detergents as exemplified by higher alkyl benzene sulfonates salts such as sodium dodecyl benzene sulfonate, acyl N-methyl taurates such as the sodium salt of N-oleyl taurate, acyl isethionates such as sodium lauryl isethionate, higher n-alkyl primary sulfonates such as primary n-dodecyl sulfonate, alpha-sulfonated higher fatty acid salts and lower molecular weight esters of such acids such as sodium alpha-sulfonated stearic acid and the methyl ester thereof respectively, and the like, as well as mixtures thereof. The instant bars are substantially dry, containing less than about 2% moisture.

The presence of the foregoing higher fatty ketone in the instant detergent bars is highly beneficial in that the ketone plasticizers the detergent and improves its processing and working characteristics, facilitating milling and extrusion thereof in bar form. It has been found that on heating of such detergents in order to achieve a plastic condition so as to improve their workability, i.e., to facilitate milling and extrusion into bar form, the presence of the ketone diminishes the stickiness and tackiness of the detergents, while at the same time plasticizing them effectively. In addition, the ketone serves to improve the appearance of the finished bar, giving a product which is harder, less sticky or tacky to the touch, waxier in appearance, and more durable in use than comparable bars from which the ketone is omitted. The ketone has also been found to increase the rate of solubility of the instant bars during use thereof, and also to improve the characteristics of the foam generated on use of these bars, i.e., texture, volume, and stability.

In order most satisfactorily to commingle the instant ketones, which are high melting solids, with the detergent material, it has been found highly effective first to dissolve or disperse the ketone in a suitable solvent to form a fluid mixture which may readily be distributed throughout the organic detergent while it is in particulate form prior to

extrusion. A preferred such solvent constitutes a molten higher fatty alcohol. Such alcohols have been found to be an excellent solvent for this purpose and, on their own accord, they contribute certain highly beneficial attributes to the final detergent bars. A preferred detergent bar composition which may be prepared using such an alcohol solvent consists essentially of about 50 to 99% water-soluble sulfated organic detergent salt containing a saturated straight chain alkyl radical having from about 12 to 18 carbon atoms, about 5 to 15% of higher fatty alcohol containing about 12 to 18 carbon atoms, about 1 to 5% of stearone, and about 0 to 10% of sodium toluene sulfonate.

The plasticization effected by the instant ketone or ketone-alcohol combination is such that the instant compositions may be mechanically worked, compacted, and shaped at a temperature in the range from about 47 to 65° C., milling desirably being carried out at about 47 to 60° C. and plodding or extrusion through a die into bar form and stamping being carried out at about 35 to 50° C.

The following examples are given to illustrate additionally the nature of the invention and it will be understood that the invention is not limited thereto. All proportions or parts are by weight unless otherwise specified.

Example I

46.7 parts of the sodium salt of hydrogenated coconut oil monoglyceride monosulfate (containing 10% sodium sulfate) in the form of spray dried beads are thoroughly mixed with 33.0 parts of sodium lauryl sulfate flakes, 1.8 parts of preservative, pigment and perfume, and 2.5 parts of powdered sodium toluene sulfate. 12.0 parts of cetyl alcohol are heated separately to 64° C., and 4.0 parts of stearone are dissolved therein. The alcohol-stearone mixture is then uniformly dispersed throughout the mixed detergent material, and the entire mass is milled until it is substantially homogeneous. During milling the temperature of the milled material rises to about 50° C., at which temperature it forms an easily workable plastic mass. The milled product is formed into a bar by extruding it at about 55° C. through a die using a conventional soap plodder. The extruded bar is cut into individual detergent cakes which are stamped in a soap press before they cool below about 35° C., and thereafter are wrapped.

Example II

Detergent bars having the following composition are prepared in accordance with the procedure of Example I:

Ingredients:	Parts by weight
Sodium salt of monosulfated hydrogenated coconut oil monoglyceride (containing 10% sodium sulfate)	47.8
Sodium salt of hydrogenated and sulfated higher fatty alcohol obtained by reduction of coconut oil fatty acids (containing 15% sodium sulfate)	31.8
Mixed cetyl and stearyl alcohols obtained by reduction of tallow fatty alcohol	9.0
Sodium toluene sulfate (containing 15% sodium sulfate)	6.3
Stearone (derived from commercial stearic acid)	3.0
Preservative, pigment and perfume	2.1

The detergent bars of this example exhibit greatly improved physical properties and characteristics including improved ease of processing and improved lathering as contrasted to bars prepared from the same composition in which the stearone has been replaced by an additional 3% of cetyl alcohol.

Example III

53 parts of spray dried beads of the sodium salt of monosulfated hydrogenated coconut oil monoglyceride,

30.0 parts of drum dried chips of sodium lauryl sulfate, and 2.0 parts of preservative and perfume are thoroughly commingled, and then 11.0 parts of cetyl alcohol in which there has previously been dissolved 4.0 parts of stearone is uniformly dispersed throughout the blend. This final mixture is milled at about 48° C. until uniform, and is then extruded in the form of a bar at about 55° C. The bars are stamped in a soap press at 35–40° C. Similar results are obtained if palmitone is substituted for stearone.

Example IV

67.2 parts of spray dried beads of the sodium salt of hydrogenated coconut oil monoglyceride monosulfate, 13.0 parts of drum dried chips of sodium lauryl sulfate, 5.0 parts of sodium chloride crystals and 1.8 parts of preservative, pigments and perfume are intimately blended. The mixture is then milled, and during milling 11.0 parts of solid cetyl alcohol and 2.0 parts of solid stearone are milled successively into the mixture, the temperature of the milled material being about 50° C. After milling, the homogeneous material, which is in a freely workable plastic form. is extruded through a plodder at about 55° C. and stamped in a soap press at 38° C. to produce an eminently satisfactory bar product.

Example V

A satisfactory bar may be prepared by processing the following constituents in accordance with the procedure of Example I.

Ingredients:	Parts by weight
Sodium salt of monosulfated monoglyceride of hydrogenated coconut oil	48.7
Sodium lauryl sulfate	17.5
Magnesium salt of sulfated fatty alcohols obtained by reduction of tallow fatty acids	15.0
Sodium toluene sulfate	5.0
Cetyl alcohol	8.0
Stearone	4.0
Perfume, pigment and preservatives	1.8

While there has been described that which is at present considered to be the preferred embodiment of the invention, it will be understood, of course, that many changes, modifications and substitutions may be made therein without departing from the true scope of the invention as defined in the appended claims.

What is claimed is:

1. A detergent bar consisting essentially of about 50 to 99% of a sodium salt of a sulfated organic detergent containing a saturated straight chain higher alkyl radical having from about 12 to 18 carbon atoms and about 0.5 to 10% by weight of a fatty ketone selected from the group consisting of stearone and palmitone.

2. A detergent bar set forth in claim **1** wherein said sulfated detergent is a sodium salt of a monosulfated monoglyceride of higher fatty acids containing from about 12 to 18 carbon atoms.

3. A detergent bar as set forth in claim **1** wherein said sulfated detergent is a sodium salt of a sulfated higher fatty alcohol containing from about 12 to 18 carbon atoms.

4. A detergent bar as set forth in claim **1** which contains about 5 to 15% of a higher fatty alcohol containing about 16 carbon atoms.

5. A detergent bar as set forth in claim **1** which contains a minor proportion, up to about 10% of sodium toluene sulfonate.

6. A detergent bar as set forth in claim **1** which contains a minor proportion of sodium chloride.

7. A detergent bar as set forth in claim **1** which contains about 40 to 70% of the sodium salt of a monosulfated monoglyceride of a saturated higher fatty acid containing from about 12 to 18 carbon atoms, about 10 to 35% of the sodium salt of a sulfated saturated fatty

alcohol containing from about 12 to 18 carbon atoms, about 5 to 15% of a fatty alcohol containing about 16 carbon atoms, about 1 to 5% stearone, and about 0 to 10% sodium toluene sulfonate, said percentages being by weight of the composition.

8. A detergent bar as set forth in claim 7 which contains about 45 parts of the sodium salt of hydrogenated coconut oil monoglyceride monosulfate, about 35 parts of sodium lauryl sulfate, about 2.5 parts of sodium toluene sulfonate, about 12.5 parts of cetyl alcohol, and about 5.0 parts of stearone, said parts being by weight of the composition.

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