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GERMICIDAL SOAP

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This invention relates to germicidal soap; and more particularly to such soaps, either solid or liquid, which contain a phenol and which retain the detergent properties of the soap and the germicidal or antiseptic properties of the phenol. The amount of phenol used in the new soaps of the present invention is relatively small, so that the soaps retain their detergent properties and when used in a concentration such that the concentration of phenol is such as to give effective germicidal action are effective detergents or washing agents.

A great number of compositions containing soap and phenols of one type or another have previously been suggested and used as antiseptic compositions; the soap having frequently been used or proposed for use as a solubilizing agent for the phenols, many of which are not sufficiently soluble in water to produce an antiseptic solution unless some other agent is included in the solution to increase their solubility or dispersion.

Such compositions in general have used the soap in about equal proportions with the phenol, or have used the phenol in greater amounts than the soap, so that in any concentration of the mixture in water which is effective and usable as an antiseptic or germicide, the amount of soap present is too small to have any effective detergent or washing action and the solutions are disinfecting or germicidal solutions rather than detergent solutions. Such compositions, whether solid or liquid, have not been available for use as germicidal soaps, because the proportion of phenol which they contain is so great that their detergent action is not comparable to the detergent action of ordinary soap.

It is accordingly the object of the present invention to provide a soap which is germicidal or antiseptic, and which may be used as an ordinary soap, that is, as a detergent or washing agent, and which combines with its detergent or washing properties the property of serving as a germicide or antiseptic.

In accordance with the present invention, soaps are produced from saturated fatty acids with the stoichiometric quantity of caustic soda or caustic potash required to produce a neutral soap, i. e. a soap which has no free fatty acid, or a slight excess of the caustic may be used to insure that the resulting soap has no free fatty acid. The fatty acids used are the saturated fatty acids of the soap-forming series, such as lauric, myristic, palmitic, or stearic acid, and, while it is not necessary that the fatty acids be pure, it is necessary that they contain no substantial amount of

unsaturated fatty acids, and that they continue no substantial amount of unsaponifiable material.

With a soap from one of these fatty acids or a mixture of them, is combined a relatively small amount of a phenol, preferably an alkyl phenol having a high germicidal or antiseptic property. The phenols which are advantageously used are the higher and more active phenols such as the alkyl phenols, the alkyl cresols, the alkyl resorcinols, etc., such highly active phenols as secondary and tertiary butyl, amyl and hexyl cresols being particularly advantageous both from the point of view of germicidal activity and stability. These phenols are incorporated in the composition in proportions ranging from about 1% to about 10% by weight, based on the soap; a somewhat higher proportion of the phenol being used in the production of liquid soap compositions than is used in the production of solid soap compositions or bar soaps, and the more active phenols being used in smaller proportions than the less active phenols. For example, a phenol such as secondary or tertiary hexyl cresol may be used in proportions ranging from about 1% to about 10% based upon the weight of the soap used.

The presence of soap from unsaturated fatty acids in substantial amounts, or the presence of unsaponifiable or unsaponifiable material, other than the phenol, in the soap product has a marked inhibiting effect upon the germicidal or antiseptic activity of the composition. For example, if a few percent of a soap from oleic acid be incorporated in such a composition, the activity of the composition may be reduced by as much as two-thirds; and the presence of a small amount of free fatty acid, or a small amount of unsaponified or unsaponifiable material, such as free oil or fat, or other unsaponifiable material, may reduce the germicidal or antiseptic activity of the composition by as much as 75%.

The soap compositions may also contain a small amount of a suitable material to mask the odor of the composition, or to impart a desirable odor to the composition. Any perfuming ingredients used should in general be of a more or less phenolic character. Such aromatic compositions as oil of cloves or creosote may be used with advantage. Oil of cloves contains eugenol, which is a propenyl guaiacol, and creosote contains cresol and guaiacol. Other perfuming agents, such as lemon grass oil, bergamot oil, camphor oil, thyme oil, and tar oil, which are non-phenolic in character, exhibit a marked inhibiting action upon the germicidal or antiseptic

properties of the composition, and even when used in small amounts may reduce the activity by about two-thirds, more or less.

Excess free fatty acid, or free fat or oil, such as olive oil, reduces the activity of the composition in a similar manner. For example, if to a germicidal soap composition made up of the soap of one or more saturated fatty acids and a small proportion of secondary hexyl cresol is added about 1% of capric acid, with the resulting liberation of some of the higher fatty acids, the germicidal or antiseptic activity of the composition is greatly reduced.

In a similar manner, the addition of a soap of an unsaturated fatty acid, such as oleic acid, to the germicidal detergent compositions markedly reduces the germicidal activity of them. For example, if to an active soap composition made from sodium stearate and containing, as the phenol, secondary hexyl cresol, is added a relatively small proportion of sodium oleate, the germicidal activity is greatly decreased. If 25% of the sodium stearate is replaced by an equal molecular proportion of sodium oleate, the germicidal activity of the composition is reduced by approximately two-thirds.

Both the potassium soaps and the sodium soaps of the saturated soap-forming fatty acids behave in a similar manner, forming antiseptic or germicidal detergent compositions when admixed with a suitable phenol.

The invention will be further illustrated by the following examples, but it is not limited thereto.

Example I.—An aqueous liquid soap containing about 10% of the sodium soap of one or more saturated fatty acids, such as lauric, myristic, palmitic and stearic acids, is made and to the resulting liquid soap is added 1% of secondary or tertiary hexyl cresol. The resulting liquid soap is a good detergent, and is an effective germicide when used in solution in water in the same manner as liquid soap is ordinarily used.

Example II.—To a solid soap containing 15% of water and 85% of the sodium soap of one or more saturated fatty acids is added from 1 to 10% of secondary or tertiary hexyl cresol. The resulting soap has a detergent or washing action similar to that of ordinary bar soap, and is an effective germicide when used as such soaps are ordinarily used.

Alkyl di-hydroxy phenols, such as alkyl resorcinols, catechols, etc., may also be used advantageously.

Thus by the present invention, I provide a soap composition, containing the sodium or potassium soaps of one or more saturated soap-forming fatty acids in admixture with a suitable phenol, advantageously an alkyl phenol or cresol or resorcinol or other highly active phenol,

which is an effective germicide and which retains the detergent or washing properties of the soap despite the incorporation of the phenol in amounts sufficient to make detergent solutions of the composition germicidal.

I claim:

1. A germicidal and detergent soap composition exhibiting effective germicidal activity and possessing effective detergent and washing properties, which composition comprises an alkali metal soap of at least one saturated fatty acid and from about 1% to about 10%, based on the soap, of an alkyl phenol capable of acting as a germicide, which soap is free from soaps of unsaturated fatty acids and substantially free from unsaponifiable and unsaponified material other than phenol.

2. A germicidal and detergent soap composition as in claim 1, in which the alkyl phenol is an alkyl cresol.

3. A germicidal and detergent soap composition as in claim 1, in which the alkyl phenol is an alkyl cresol, in which the alkyl group has at least four but not more than six carbon atoms.

4. A germicidal and detergent soap as in claim 1, in which the phenol is an alkyl di-hydroxy phenol.

5. A liquid aqueous soap composition which exhibits effective germicidal activity, possesses effective detergent and washing properties, and which comprises from about 0.1% to about 1% of an alkyl phenol capable of acting as a germicide and about 10% of soap of saturated fatty acids, and which is substantially free from unsaponified and unsaponifiable fatty material.

6. A germicidal and detergent soap composition as in claim 5, in which the alkyl phenol is an alkyl cresol.

7. A germicidal and detergent soap composition as in claim 5, in which the alkyl phenol is an alkyl cresol, in which the alkyl group has at least four but not more than six carbon atoms.

8. A solid germicidal and detergent soap exhibiting effective germicidal activity and possessing effective detergent and washing properties which soap contains about 15% water and from about 1% to about 10%, based on the soap, of an alkyl phenol capable of acting as a germicide, said soap being a water-soluble soap of saturated fatty acids and substantially free from unsaponified and unsaponifiable fatty material and from soap of unsaturated fatty acids.

9. A germicidal and detergent soap composition as in claim 8, in which the alkyl phenol is an alkyl cresol.

10. A germicidal and detergent soap composition as in claim 8, in which the alkyl phenol is an alkyl cresol, in which the alkyl group has at least four but not more than six carbon atoms.

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