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ANTISEPTIC DETERGENT COMPOSITION

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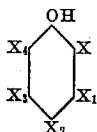
6 Claims. (Cl. 252—107)

This invention relates to new and novel detergent compositions. More particularly it relates to detergent compositions exhibiting antiseptic properties. Still more particularly it relates to antiseptic detergent compositions containing a pentahalogenated phenol.

Phenolic compounds and many derivatives thereof have long been claimed as effectively preventing or arresting the growth or action of micro-organisms either by inhibiting their activity or by destroying them. However, it is well known that phenolic compounds lose their antiseptic effectiveness in alkaline media and there is much evidence to the effect that detergents such as soap can not be rendered germicidal or bactericidal by incorporating therein small amounts of phenolic materials. Detergents of themselves are not effective against *Staphylococci* and for purposes of this patent application the expression "antiseptic detergent composition" refers to those detergent compositions which are satisfactory detergents and which are effective against *Staphylococci* such as *Staphylococcus aureus* (now known as *Micrococcus pyogenes* var. *aureus*).

Phenolic compounds have been compounded with detergents such as soap to make detergent-containing disinfectants, however, such compositions are not used for detergent purposes. The purpose of the soap or other detergent in disinfectant compositions is fundamentally to solubilize the phenolic compound and ordinarily the amount of detergent present is not greater than the phenolic content of the disinfectant composition. Usually the phenolic content in disinfectant compositions is in the neighborhood of 15 to 25 per cent.

In accordance with this invention it has been found that pentahalogenated phenols of the general formula



where X, X₁, X₂, X₃, and X₄ are like or unlike halogen atoms exhibit excellent antiseptic properties in a detergent composition when present in minor proportions. The pentahalogenated phenols of this invention are easily incorporated in detergent compositions whether the latter be solid or liquid. They are non-volatile and remain permanently in the detergent composition. They do not effect the lathering, cleansing, or physical properties of the detergent composition and neither do they impart an unpleasant odor nor discolor the finished detergent composition.

As exemplary of this invention several pentahalogenated phenols, namely pentachlorophenol, pentabromophenol, and p-bromo tetrachlorophenol, were compared in a detergent composition to various halogenated phenols claimed to possess antiseptic or disinfectant properties. The phenols listed below were incorporated in an "Ivory" brand neutral white high grade tallow toilet soap to form 2% by weight halogenated phenol detergent compositions, that is, a ratio one part phenol to 50 parts soap. Aliquots of each were added to a nutrient agar medium so as to give concentrations of 1.25 p. p. m., 2.5 p. p. m., 5 p. p. m. and 10 p. p. m. of the respective halogenated phenols in the nutrient agar. The agar, in each case, was then poured into a petri dish, allowed to harden, and then streaked with a 24 hour old culture of *Micrococcus pyogenes* var. *aureus* (formerly known as *Staphylococcus aureus*). The incubation in each case was made at 37° C. for 48 hours

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and the degree of growth noted. The results are tabulated below:

Table

5	Halogenated Phenol Concentration	10 p. p. m.	5 p. p. m.	2.5 p. p. m.	1.25 p. p. m.
10	p-chlorophenol.....	+++	+++	+++	+++
	2,4-dichlorophenol.....	+++	+++	+++	+++
	p-chloro-3,5 xlenol.....	+++	+++	+++	+++
	pentachlorophenol.....	—	—	—	—
	pentabromophenol.....	—	—	—	—
	p-bromo tetrachlorophenol.....	—	—	—	—

Legend:

- 15 — no growth, complete inhibition.
1/2 + extremely light growth, one to two colonies.
+ light, weak growth.
++ light to moderate growth.
20 +++ moderate growth.

As further exemplary of the antiseptic properties of the new detergent compositions the above described 2% by weight pentachlorophenol detergent composition was diluted 1 to 9 with water (concentration of halogenated phenol 1:500) and tested for its antiseptic properties according to the method described in U. S. Food and Drug Administration Circular 198 of December 1931. A standard 24 hour broth culture of *Staphylococcus aureus*, contact times of 5, 10, and 15 minutes, and a temperature of 37° C. were used in the tests. In all three instances the diluted new antiseptic compositions destroyed all of the bacteria.

In the above tests in order to check the organism *Staphylococcus aureus*, for proper resistance, a "plate count" was run on phenol of dilution of 1:70 and 1:80 and only those cultures having proper resistance were employed in the respective tests.

Relatively small amounts of pentahalogenated phenols when incorporated in a detergent composition have been found to yield efficient antiseptic detergent compositions as evidenced by the above examples. Amounts as low as 0.5 to 1% of the pentahalogenated phenols based upon the weight of the detergent have been proved satisfactory in some cases. However, it is preferred to employ amounts in the order of 1 to 3% by weight. While larger amounts may be employed the upper limit which may be used is preferably not more than 5% by weight. Other antiseptic agents may be incorporated as well as emollients, water softeners and the well known "vehicles" of the soap trade. Various colors, antioxidants, perfumes, alkaline builders, and fillers may be included where desirable.

The term "detergent" includes soap and synthetic detergents particularly the anionic detergents such as the substituted amides and alkyl aryl sulfonates. The term "detergent" includes also mixtures of synthetic detergents and soap, as for example, those combinations of salt free anionic synthetic detergent to soap of 1:3 to 1:2 parts by weight. The term "soap" as used herein is employed in its popular or ordinary meaning, that is, those prepared from an alkali metal compound such as potassium or sodium hydroxide and a fat or fatty acid.

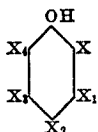
The pentahalogenated phenols of this invention may be added to the detergent composition in any suitable manner during the crutching or milling or similar operation. The pentahalogenated phenols may be first dissolved in a suitable solvent and then incorporated in the detergent if so desired. In general any method which results in the halogenated phenols of this invention being uniformly incorporated in the final detergent composition is satisfactory.

By "halogen" unless otherwise specified in the specification and claims is meant members of the group consisting of chlorine, bromine, iodine, and fluorine. The preferred halogen substituent is chlorine.

While the invention has been described relative to several particular embodiments it is to be understood that it is not limited thereby, but that many variations and modifications which are obvious to those skilled in the art may be made without departing from the spirit or scope of the invention.

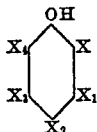
What is claimed is:

1. An antiseptic detergent composition comprising a detergent soap and 0.5 to 5% by weight based upon the weight of the detergent soap of a pentahalogenated phenol of the general formula



where X, X₁, X₂, X₃, and X₄ are halogen atoms.

2. An antiseptic detergent composition comprising a detergent soap and 0.5 to 5% by weight based upon the weight of the detergent soap of pentahalogenated phenol of the general formula



where X, X₁, X₂, X₃, and X₄ are like halogen atoms.

3. An antiseptic detergent composition comprising a detergent soap and 0.5% to 5% based upon the weight of the detergent soap of pentachlorophenol.

4. An antiseptic detergent composition comprising a detergent soap and 1% to 3% based upon the weight of the detergent soap of pentachlorophenol.

5. An antiseptic detergent composition comprising a detergent soap and 1% to 3% based upon the weight of the detergent soap of pentabromophenol.

6. An antiseptic detergent composition comprising a detergent soap and 1% to 3% based upon the weight of the detergent soap of p-bromotetrachlorophenol.

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