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# CLEANING COMPOSITION

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## ABSTRACT OF THE DISCLOSURE

A cleaning agent for rugs, carpets and the like comprising a mixture of (1) ammonium or alkali metal salts of alkyl sulfates wherein the alkyl has 12 to 14 carbon atoms, (2) ammonium or alkali metal salts of certain sulfonic or amino-carboxylic acids, and (3) about 0.7 to 10% by weight of a solvent mixture containing (a) water-soluble organic solvents capable of forming azeotropic mixtures with water above 80° C. and (b) chlorinated hydrocarbons, all in admixture with water.

This invention relates to cleaning compositions, and it particularly relates to compositions for cleaning rugs and similar fibrous materials.

The ability to clean rugs and similar fibrous materials, whether of wool or synthetic fibers, of such things as dust and dirt, lipstick, coffee, tea, food greases, and the like, has always presented a problem. It has, heretofore, been found that any cleaning agent capable of even partially removing such stains as are caused by lipstick, coffee, tea, greases, etc., was also hazardous to use because it damaged the fibers, or was flammable, or both. Such prior cleaning agents were, furthermore, often unstable and could not be easily packaged or stored.

It is, therefore, the primary object of the present invention to provide a stable, effective cleaning agent for fibrous materials, such as rugs, and the like, which will not damage the fibrous material and will not constitute a fire hazard either in storage, shipment or use.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description and claims.

In accordance with the present invention, the cleaning compositions constitute a mixture of (1) about 0.5 to 30% by weight ammonium or alkali metal salts of $C_{12}$ and/or $C_{14}$ alkyl sulfates, (2) about 0.5 to 30% by weight ammonium or alkali metal salts of certain sulfonic or amino-carboxylic acids, and (3) about 0.7 to 10% by weight of a solvent mixture containing (a) water-soluble organic solvent having a flash point not lower than about 170° F. when it is present in the cleaning composition and which is capable of forming azeotropic mixtures with water above 80° C. and (b) chlorinated hydrocarbons.

The following examples are provided for illustrative purposes and with no intent to limit the invention except as claimed:

EXAMPLE 1

| Components: | Percent by weight |
|---|---|
| Sodium lauryl sulfate | 3.0 |
| Sodium lauroyl sarcosinate | 3.0 |
| Dioxane | 4.5 |
| Trichloroethylene | 2.0 |
| Water | Balance |

The sodium lauryl sulfate and sodium lauroyl sarcosinate together with the dioxane are thoroughly mixed at room temperature and pressure until the solution is clear. The trichloroethylene is then added and the mixture is again agitated at room temperature and pressure



until it is again clear. Then the water is added at the same temperature and pressure to complete the composition.

EXAMPLE 2

| Components: | Percent by weight |
|---|---|
| Ammonium lauryl sulfate | 4.0 |
| Ammonium lauroyl sarcosinate | 4.0 |
| Nitromethane | 4.5 |
| Perchloroethylene | 2.5 |
| Water | Balance |

These components are mixed in the same manner as in Example 1 to form the composition, the sulfate and sarcosinate being first mixed with the nitromethane, and then the chlorinated solvent, namely, the perchloroethylene, being added, followed by the addition of the water to complete the composition.

Each of the lauryl sulfate and the sarcosinate may be present, within the scope of this invention, in a proportion of between about 0.5 to 30% by weight of the total composition.

The above examples utilize sodium or ammonium lauryl sulfate and sodium or ammonium lauroyl sarcosinate. However, it is within the scope of the present invention to substitute any alkali metal for the sodium or ammonium in either the sulfate or sarcosinate. It is further within the scope of the invention, as indicated above, to use myristyl instead of lauryl sulfate, or to use a mixture of lauryl and myristyl in any desired relative proportions. It is also within the scope of the invention to substitute any alkali metal or ammonium higher acyl (such as oleyoyl, palmitoyl, etc.) isethionate or any alkali metal or ammonium higher acyl turate for the sarcosinate embodied in Examples 1 and 2.

The organic solvents are of prime importance in forming a stable surfactant system. Such solvents must possess a certain degree of water solubility and, as indicated above, must be capable of azeotropic formation with water above 80° C. Solvents which do not possess these characteristics are not capable of forming stable systems. The order of cleaning effectiveness of a composition contining the particular organic solvent is a function of the water solubility of the solvent. The lower the water solubility the more effective the cleaning performance. However, the composition must also be stable. The type of organic solvent useful for the present purpose is therefore a function of its relative water-insolubility (although there must be some solubility) and its stability. It must also have an acceptable flash point and minimum inherent fire hazard characteristics.

Illustrative of the type of non-chlorinated organic solvents utilizable for the present purposes are amyl alcohol, isobutyl alcohol, dioxane, butyl "Carbitol," nitromethane, sec. butyl alcohol, allyl alcohol and methyl "Cellosolve."

The chlorinated hydrocarbons may be any member of this class although the chlorinated lower alkylenes are preferred. These chlorinated hydrocarbons are provided in a proportion relative to the non-chlorinated organic solvents of preferably between about 1:3 and 1:1 by weight.

The solvents, as stated above, should preferably not flash below 170° F. when embodied in the composition. In this respect, the water in the composition serves to materially raise the inherent flash point of the solvents.

It is to be noted that regardless of the constituents used within the scope of the present invention, as described above, the proportions of the components and the preparation of the composition will be identical to those disclosed in Examples 1 and 2. Therefore, these examples are intended to also serve as examples of the preparation of the other compositions within the scope of the invention.

The invention claimed is:

1. A cleaning composition consisting essentially of (1) about 0.5 to 30% by weight of a member of the group consisting of ammonium and alkali metal salts of alkyl sulfates, wherein the alkyl is a member of the group consisting of lauryl, myristyl and mixtures thereof. (2) about 0.5 to 30% by weight of a member of the group consisting of ammonium and alkali metal salts selected from the group consisting of lauroyl, oleyoyl and palmitoyl sarcosinate, lauroyl, oleyoyl and palmitoyl isethionate and lauroyl, oleyoyl and palmitoyl taurate, (3) about 0.7 to 10% by weight of a solvent mixture consisting essentially of a non-chlorinated water-soluble organic solvent having a flash point not lower than about 170° F. when embodied in the composition, and which is capable of forming azeotropic mixtures with water above 80° C., and chlorinated lower alkylene, the chlorinated lower alkylene being present in a proportion of between about 1:3 to 1:1 by weight relative to the non-chlorinated solvent, and (4) water to make 100% by weight.

2. The composition of claim 1 wherein the organic solvent is a member of the group consisting of amyl alcohol, isobutyl alcohol, dioxane, diethylene glycol monobutyl ether, nitromethane, sec. butyl alcohol, allyl alcohol and ethylene glycol monobutyl ether.

3. A method of cleaning fibrous materials which comprises applying to said fibrous materials a cleaning composition consisting essentially of (1) about 0.5 to 30% by weight of a member of the group consisting of ammonium and alkali metal salts of alkyl sulfates, wherein the alkyl is a member of the group consisting of lauryl, myristyl and mixtures thereof, (2) about 0.5 to 30% by weight of a member of the group consisting of ammonium and alkali metal salts selected from the group consisting of lauroyl, oleyoyl and palmitoyl sarcosinate, lauroyl, oleyoyl and palmitoyl isethionate and lauroyl, oleyoyl and palmitoyl taurate, (3) about 0.7 to 10% by weight of a solvent mixture consisting essentially of a non-chlorinated water-soluble organic solvent having a flash point not lower than about 170° F. when embodied in the composition, and which is capable of forming azeotropic mixtures with water above 80° C., and chlorinated lower alkylene, the chlorinated lower alkylene being present in a proportion of between about 1:3 to 1:1 by weight relative to the non-chlorinated solvent, and (4) water to make 100% by weight.



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