Our invention relates to compositions for softening textile goods, more particularly to mixtures of fatty acid carboxamides or their N-substitution products with sulfonation products of hydroxylated paraffin derivatives or to such of oleic acid amide or its N-substitution products.

In the manufacture and finishing of goods containing artificial silk the soft touch of the goods is of great importance. To obtain this soft touch such goods are generally subjected to a process of promoting the scrop before finishing. A similar treatment is customary for the preparation of various cotton goods. For this process soap and various products are used which are prepared in most cases by starting from fats and which contain sulfonic and/or carboxylic acid groups, which groups render the compounds water-soluble. By using such oil emulsions a certain softness of the goods but not the desired smooth touch is obtained.

In accordance with our present invention, a particularly good softening effect is obtained by fixing on the fiber small quantities of certain water-insoluble substances, hereinafter defined which are solid at ordinary temperature. Mixtures of such substances with known softening agents are distinguished by a remarkable capacity for increasing the softening effect. But particularly good softening effects are obtained by mixing the said water-insoluble substances with hydrotropic bodies which per se have no softening effect, or only to a small degree.

The term "hydrotropic bodies" is intended to define such compounds as show in aqueous solutions the characteristic capacity of converting water-insoluble substances into an aqueous emulsion (cf. Carl Neuberg, Biochemische Zeitschrift, vol. 76 (1916), page 107).

The water-insoluble substances of the required type comprise aliphatic compounds of fat-like character which correspond to the general formula

\[ \text{C}_n\text{H}_{2n+1}\text{OOH} \]

wherein \( n \) stands for the numeral 15 or 17 and the \( X \)'s mean hydrogen or an alkyl, aralkyl and/or aryl-residue.

As hydrotropic products resistant towards hard water there are added aliphatic sulfonation products corresponding to the general formula

\[ (\text{C}_m\text{H}_{2m-1}\text{O})(\text{SO}_2\text{H}) \]

wherein \( m \) means the number including 12 to about 30, or sulfonation products of products corresponding to the general formula

\[ \text{C}_n\text{H}_m\text{CON} \]

wherein the \( X \)'s mean hydrogen or an alkyl, aralkyl or aryl-group, i.e., sulfonation products, namely true sulfonic acid as well as sulfuric acid esters of hydroxylated paraffin derivatives containing 12 to about 30 carbon atoms and about one hydroxy-group or of oleic amide or its N-substitution products. The addition of such materials produces a colloidal solution of the substances containing hydrophilic groups. Solutions thus obtained may be employed directly or may be concentrated by driving off the solvent.

The mixtures obtained according to our present invention are distinguished from the mixtures hitherto used consisting of fatty acid amidocompounds with other sulfonation products by a special softening effect. The emulsions obtained are of so fine a distribution that they must be considered as real colloidal solutions.

The mixtures are obtained by mixing the components advantageously not in equimolecular proportions, but by using a more than equimolecular amount of the hydrotropic ingredient, i.e., the sulfonation product of the aforesaid type. In order to carry out a particularly advantageous method of producing said mixtures one may mix an initial product corresponding to a hydrotropic product of the aforesaid type but containing no sulfonic acid group and corresponding to the general formula

\[ \text{C}_n\text{H}_{2n+1}\text{OH or C}_n\text{H}_m\text{CON} \]

wherein \( m \) and \( X \) have the aforesaid significations, with a water-insoluble compound of the type described and subject the mixture to a sulfonation process.
tion process under such conditions that after the process of sulfonation and isolation the water-insoluble component contains no sulfuric acid radical.

In order to further illustrate our invention the following examples are given, the parts being by weight and all temperatures in Centigrade degrees, however it is to be understood that our invention is not limited to the particular products or reacting conditions mentioned therein.

**Example 1**

45 parts of the product obtained by heating a trichlorinated hard paraffin for about 10 hours in a closed vessel while stirring at 225-230 with an aqueous caustic soda solution and by acting on the product thus obtained which represents an unsaturated viscous liquor containing 24 to 27 carbon atoms and approximately one hydroxyl group and still containing chlorine, at temperatures below zero with chlorosulfonic acid after addition of a solvent such as petroleum, are transformed into an aqueous paste of about 50% strength and mixed with 10 parts of palmitic acid amide of the formula

\[
\text{CH}_3\text{(CH}_2\text{)}_7\text{CONH}_2
\]

Thereafter the mixture is heated to about 70° for about an hour while stirring.

Instead of palmitic acid amide, its N-substitution products, such as the condensation products of palmitic acid chloride with monochloremine, cyclohexylamine or benzylamine, instead of the above named sulfonation product, one of a hydroxylated derivative of a liquid paraffin, such as vaseline oil containing about 18 carbon atoms, may be used.

**Example 2**

38 parts of the sodium salt of the sulfonic acid ester of the laurylalcohol of the probable formula

\[
\text{C}_9\text{H}_{17}\text{OSO}_3\text{Na}
\]

are mixed with 12 parts of stearic acid amide of the probable formula

\[
\text{C}_9\text{H}_{17}\text{CONH}_2
\]

and about 200 parts of water and the mixture is heated while well stirring at about 80-90° until a test is entirely soluble in water. While well stirring the mass is allowed to cool down.

**Example 3**

80 parts of oleic acid amide of the formula

\[
\text{C}_9\text{H}_{17}\text{CONH}_2
\]

are mixed with 20 parts of stearic acid amide of the formula

\[
\text{C}_9\text{H}_{17}\text{CONH}_2
\]

and about 200 parts of trichloroethylene. To this mixture while cooling at 6-5° 100 parts of sulfuric acid monohydrate are added. When the sulfonation has been finished the reaction mass is poured on ice, the upper aqueous acidic layer is separated and the under layer containing the reaction product is neutralized by means of a caustic soda solution. After distilling off the solvent the product remains as a homogeneous water-soluble paste containing a mixture of the sulfonation product of oleic acid amide with unsulfonated stearic acid amide.

**Example 4**

75 parts of oleic acid ethylanilide of the formula

\[
\text{C}_9\text{H}_{17}\text{CON} \rightarrow \text{C}_9\text{H}_{17}\text{CONH}_2
\]

are mixed while stirring with 25 parts of stearic acid ethylanilide of the formula

\[
\text{C}_9\text{H}_{17}\text{CON} \rightarrow \text{C}_9\text{H}_{17}\text{CONH}_2
\]

and about 200 parts of trichloroethylene and the mixture is cooled down to about -4-5°. Then at temperatures ranging from zero to 5° 110 parts of concentrated sulfuric acid are added. The isolation of the reaction product is carried out as described in the foregoing example. The product contains a mixture of the sulfonation product of oleic acid ethylanilide with unsulfonated stearic acid ethylanilide.

With a similar good result instead of the ethylanilide compounds the corresponding diphenylamine compounds may be used.

**Example 5**

A mixture of 75 parts of oleic acid diethylamide of the formula

\[
\text{C}_9\text{H}_{17}\text{CON} \rightarrow \text{C}_9\text{H}_{17}\text{CONH}_2
\]

and 25 parts of palmitic acid diethylamide of the formula

\[
\text{C}_9\text{H}_{17}\text{CON} \rightarrow \text{C}_9\text{H}_{17}\text{CONH}_2
\]

dissolved in about 200 parts of trichloroethylene and this solution is sulfonated by the action of about 100 parts of sulfuric acid monohydrate at 6-10°. The reaction product is isolated as described in Example 3. It contains a mixture of sulfonated oleic acid diethylamide with unsulfonated palmitic acid diethylamide.

**Example 6**

A mixture of 40 parts of laurylalcohol of the formula

\[
\text{CH}_3\text{(CH}_2\text{)}_{11}\text{OH}
\]

and 10 parts of palmitic acid amide of the formula

\[
\text{C}_9\text{H}_{17}\text{CONH}_2
\]

are suspended in about 150 parts of trichloroethylene and this suspension is sulfonated while 130 cooling by means of 50 parts of sulfuric acid monohydrate. The sulfonation mass is poured on ice, the reaction product is converted in the usual manner into the sodium salt and freed from the solvent. The product contains a mixture of 135 the sulfuric acid ester of laurylalcohol of the probable formula

\[
\text{CH}_3\text{(CH}_2\text{)}_{11}\text{OSO}_3\text{Na}
\]

with unsulfonated palmitic acid amide.

A particularly valuable product is obtained when using instead of laurylalcohol a mixture of cetylalcohol (C_{16}H_{33}OH) and of oleylalcohol (C_{17}H_{35}OH) which is easily obtainable by the usual saponification of sperm oil.

When applying the mixtures and colloid solutions above described to the finishing bath in quantities of 0.2 to 2 grs. per liter of said bath a soft and compact touch of the textile goods containing artificial silk is obtained. The present
compositions may be likewise used for the dye-bath since the touch remains even after the rinsing process.

As is evident from the foregoing examples, the process of sulfonating a mixture of saturated acid amides and of hydroxylated compounds or oleic acid amides respectively can be carried out under such conditions that only the second component is practically sulfonated, i. e. either by using a quantity of the sulfonating agent which is insufficient for sulfonating both components or by applying low temperatures during the sulfonation process.

We claim:

1. A composition for softening textile goods comprising a mixture of a water-insoluble fatty acid amidocompound of the general formula

\[ \text{C}_n\text{H}_{2n+1}\text{CO-} \]

wherein \( n \) stands for the number 15 or 17 and the X's mean hydrogen or an alkyl, benzyl or phenyl radical, with a sulfonation product of a derivative of an aliphatic compound of the general formula

\[ \text{C}_m\text{H}_{2m+1}\text{R} \]

wherein \( m \) means a number including 12 to about 30 and R represents the group O or

\[ \text{CO-} \]


2. A composition for softening textile goods comprising a mixture of a water-insoluble fatty acid amidocompound of the general formula

\[ \text{C}_n\text{H}_{2n+1}\text{CO-} \]

wherein \( n \) stands for the number 15 or 17 and the X's mean hydrogen or an alkyl, benzyl or phenyl radical, with an aliphatic sulfonation product of the general formula

\[ (\text{C}_m\text{H}_{2m+1}\text{O})(\text{SO}_3\text{H}) \]

wherein \( m \) means a number including 12 to about 30.

3. A composition for softening textile goods comprising a mixture of a water-insoluble fatty acid amidocompound of the general formula

\[ \text{C}_n\text{H}_{2n+1}\text{CO-} \]

wherein \( n \) stands for the number 15 or 17 and the X's mean hydrogen or an alkyl, benzyl or phenyl radical, with a sulfonation product of a derivative of an aliphatic compound of the general formula

\[ \left( \text{C}_m\text{H}_{2m+1}\text{R} \right) \]

wherein X has the aforesaid signification.

4. A composition for softening textile goods comprising a mixture of palmitic acid amide of the formula

\[ \text{CH}_3\text{(CH}_2\text{)}_{16}\text{CONH}_2 \]

and of a product obtained by decomposing a trichlorinated hard paraffin with an aqueous caustic soda solution and acting on the product thus obtained with chlorosulfonic acid in the presence of petroether.

5. A composition for softening textile goods comprising a mixture of stearic acid amide of the formula

\[ \text{C}_n\text{H}_{2n+1}\text{CONH}_2 \]

and the sulfuric acid ester of laurel alcohol of the formula

\[ \text{C}_n\text{H}_{2n}\text{OSO}_3\text{H} \]

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