

[54] **SHAMPOO COMPOSITION POSSESSING SEPARATE LOTION PHASE**

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[56] **References Cited**

FOREIGN PATENTS OR APPLICATIONS

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[57] **ABSTRACT**

A two-phase shampoo composition is made by preparing substantially polar and lipophilic portions of a shampoo composition, and mixing them together. As the result of the mixing, the lipophilic portion becomes emulsified and creamy in appearance, forming a lotion which is stable and which is lighter than the

polar phase. The lotion floats on top of the polar phase and a sharp line of demarcation is subsequently exhibited between the phases. Apparently, minor proportions of components of the polar phase are absorbed into the lipophilic phase, forming the stable lotion.

The polar phase comprises amphoteric and also, cationic surface active agents, including higher alkyl di-lower alkyl amine oxide, N-higher alkyl beta-alanine, higher fatty acid amido-lower alkyl di-lower alkyl hydroxy-lower alkyl ammonium halide, and higher fatty acid di-lower alkanolamide, with lower alcohol, water, and means to adjust the pH to within the range of about 5 to 9.5.

The lotion portion comprises a suitable oil, such as a light mineral oil, plus constituents absorbed from the polar phase to form the lotion. Although mineral oil is an important constituent of the lipophilic phase and increases the stability of the resulting product, as compared to vegetable or animal oils and fats which are sometimes employed in shampoos, small proportions of such oils may often be used, in addition to a major proportion of mineral oil in the lotion phase.

The shampoo made is used as a homogeneous temporary emulsion of the lotion and polar phase, created by shaking, and imparts a conditioning action to the hair washed with it, due to the actions of the oil, amphoteric and cationic surface active agents and the conditioners in the formula.

13 Claims, No Drawings

SHAMPOO COMPOSITION POSSESSING SEPARATE LOTION PHASE

Synthetic organic detergent shampoos that condition the human hair by having included therein specific agents for this purpose have become accepted by consumers and sales thereof have been increasing. Such compositions are often in emulsion form, appearing as creamy lotions. The lotion appearance is usually due to a lipophilic phase being dispersed in a polar aqueous phase. Liquid detergents having upper and lower phases are known, as are hair dressings in which an oil floats on water or an alcoholic solution. However, before the present invention there were no shampoos which comprised emulsion upper phases and aqueous alcoholic lower phases. In fact, such products, possessing the advantages of relatively highly concentrated oil emulsions and separate polar phases, would have been expected to be unstable, with the phases blending together on storage, instead of maintaining their sharply distinguished identities.

In accordance with the present invention there is provided a shampoo composition comprising a lower polar phase which preferably comprises an alkyl amine oxide, an N-higher alkyl substituted amino lower alkanolic acid, a higher fatty acid amide of a lower alkanolamine, a quaternary ammonium cationic detergent, water, and lower alkanol, and an upper lotion phase, lighter than the polar phase and floating on top thereof, which comprises mineral oil and minor proportions of the mentioned constituents of the polar phase.

The present compositions are made by a very efficient and readily practiced method and the products resulting exhibit excellent stability, even after prolonged periods of storage at elevated temperatures. They maintain their excellent appearance, with a clear and sparkling lower polar body portion and a creamy appearing emulsion phase, until they are intentionally shaken by the user, at which time a temporary suspension of the lotion phase in the polar phase is formed. This allows the user to employ whatever amount is desired of a uniform composition, despite the presence in the bottle during storage of separate lotion and clear polar phases. Also, the temporary emulsion returns to its initial form, with a creamy phase on top of a clear aqueous phase, within a short period of time, usually within from 30 minutes to a day. In addition to the other advantages of such two-phase system, there is the aesthetic advantage of the presence of a rich lotion phase which is pleasing to the consumer and which also indicates to her the amount of oily material present in the shampoo. Because oil or oil-based compounds are usually associated with conditioning action, the presence thereof in the lotion makes it apparent to the consumer that the shampoo is a conditioning shampoo.

Also included within the present invention is the simple method of manufacturing these shampoos, whereby the various polar body constituents are mixed together and afterward, the lotion phase ingredients are mixed therein. The temporary emulsion that initially forms resolves itself, on standing, into a lotion upper phase and a clear lower phase, with minor proportions of each phase being absorbed into the other phase helping to create the lotion, but maintaining the polar layer satisfactorily clear.

To obtain the present compositions it has been found desirable to employ amphoteric and cationic surface

active agents and to omit anionic materials. Of course, small amounts of anionics that may be employed and will not interfere with the present compositions are unobjectionable. However, ordinarily they will be expected to react with cationic materials and diminish the effectiveness thereof and therefore, they are usually to be avoided. Among the constituents of the polar phase which are important in the production of a conditioning shampoo and which result in the present desired two-phase shampoo of the character mentioned, are the amine oxides and amphoteric compounds, such as N-substituted lower amino acids. Of the amine oxides, those which are tri-substituted are preferred. The substituents are preferably alkyl of 1 to 18 carbon atoms, although alkoxyalkyl, hydroxyalkyl and aryl substituents may be present. The alkyl and aryl or the substituted radicals may be joined to the amino nitrogen directly. Of course, various non-interfering substituents may be found on the various amine oxides. The preferred tri-substituted amine oxides are the unsubstituted alkyl amine oxides, especially those wherein there are present both higher alkyl and lower alkyl groups. In the most preferred compounds, there are present one higher alkyl and two lower alkyls on the amino nitrogen of the amino oxides. The higher alkyls are of 10 to 18 carbon atoms and the lower alkyls are of 1 to 6 carbon atoms, preferably 1 to 4 carbon atoms. Exemplary of such amine oxides are myristyl dimethyl amine oxide, lauryl dimethyl amine oxide, palmityl dimethyl amine oxide, decyl diethyl amine oxide, lauryl diethyl amine oxide, myristyl methyl butyl amine oxide, and myristyl dipropyl amine oxide, bis-(hydroxyethyl) lauryl amine oxide, and bis-(hydroxyethyl) palmityl amine oxide.

The alkyl substituted amino acids are compounds of amino-lower aliphatic acids, such as the lower alkanolic acids, wherein the carbon content of the acid is from 2 to 6. Substituted on the nitrogen of such compounds is a higher alkyl, of 10 to 18 carbon atoms, preferably of 12 to 16 carbon atoms. Of course, non-interfering substituents may be present on the alkyls and/or the amino nitrogen. Such have been previously described with respect to the amine oxides.

The nitrogen of the amino acid may also have substituted thereon a lower alkyl group, usually of 1 to 8 carbon atoms, although hydrogen may be present, instead. Preferably, the alkyl substituted amino acids are mono-higher alkyl substituted lower alkanolic acids wherein the higher alkyl is of about 12 to 16 carbon atoms and the amino alkanolic acid is of 2 to 3 carbon atoms. Among the substituted amino acids are N-lauryl beta-alanine, N-palmityl beta-alanine, N-decyl beta-alanine, N-myristyl beta-alanine, N-myristyl sarcosine, N-lauryl sarcosine, and N-coco beta-amino butyric acid, which are representative of other alkyl sarcosines, alkyl taurines, alkyl betaines, alkyl N-methyl taurines, hydroxy-alkyl sarcosines and hydroxyalkyl taurines, in which the alkyls are higher alkyl, obtainable from coconut oil or tallow alcohols.

The higher fatty acid alkanolamides may be either monoalkanolamides or dialkanolamides, wherein the alkanol portion is lower alkanol, of 1 to 4 carbon atoms, e.g., ethanol, isopropanol or n-butanol. The higher fatty acid group is of 10 to 16 carbon atoms and preferably, is of 12 to 14 carbon atoms. Of course, non-interfering substituents, such as have been mentioned previously in this specification, may be present. The

various fatty acid or lower alkanol groups may be obtained from natural or synthetic materials and mixtures thereof may be present. As examples of such compounds there may be mentioned lauric myristic diethanolamide, lauric monoethanolamide, myristic mono-isopropanolamide, lauric myristic diisopropanolamide, and mono- and di-lower alkanolamides based on derivatives of coconut oil fatty acids.

The quaternary ammonium compound is preferably one in which the anion is a halogen, such as chlorine, bromine or iodine, chlorine being preferred. However, other anions may also be employed, e.g., sulfate. The substituents on the nitrogen usually include at least two lower alkyl groups of 1 to 4 carbon atoms and may include three such groups. At least one and sometimes two higher fatty alkyls of 10 to 18 carbon atoms or other long chain substituents should be present on the nitrogen. Substituted alkyl groups may also be employed, such as hydroxy-lower alkyl. Of course, non-interfering substituents may also be present on these compounds. Instead of the long chain substituent on the nitrogen there may be present an aryl or substituted aryl, such as phenyl, substituted phenyl, naphthyl or other such group. However, if an aromatic group is to be used, it is preferred that the joinder to the nitrogen be through an aliphatic linkage, such as the methylene of the benzyl radical. Representative of suitable quaternary materials, which are the preferred cationics of this invention, are tallow fatty acids amidopropyl dimethyl hydroxyethyl ammonium chloride, distearyl dimethyl ammonium chloride, dilauryl methyl ethyl ammonium chloride, dilauryl dimethyl ammonium chloride, lauryl dimethyl benzyl ammonium chloride, cetyl dimethyl ethyl ammonium chloride and methyl cetyl dibenzyl ammonium chloride. The corresponding bromides and iodides may also be used.

The combinations of the cationic quaternary material described herein and the amphoteric surface active agents, including the alkylolamides, results in the production of a good deterative shampoo which yet, acts to condition hair that has been washed with it, by depositing thereon small quantities of portions of these molecules that serve as conditioning agents. The particular blends of cationic and amphoteric surface active agents give superior conditioning and cleaning effects and still allow for the production of the two-phase lotion shampoos of this invention. Because of their natures, small proportions of such materials, usually less than 25 percent of the amount being present in the entire shampoo, are absorbed by the oily phase and serve to help produce the emulsion thereof. Of course, these compounds also have additional functions, the cationic materials serving to help prevent bacterial or other organic reactions of any vegetable or animal oils or constituents of the shampoo which are biodegradable, thereby exerting a stabilizing effect. The presence of compounds resembling the amino acids of proteinaceous materials aids in causing the conditioning agents to hold fast to the proteinaceous hair being washed. Thus, the combination of surface active materials described herein is of importance in obtaining the desired results.

The alcohol present is a lower alcohol of 2 to 4 carbon atoms, preferably from 2 to 3 carbon atoms. As examples thereof there may be mentioned ethanol and isopropanol, the preferred alcohols. These may be incorporated in the present compositions as aqueous so-

lutions, if desired. In some instances it may be desirable to employ additional organic solvents with the alcohols, such as glycols and glycerine, but usually the alcohol alone is sufficient to perform the solvent function in these shampoos.

The water employed may be ordinary tap water, usually of a hardness of less than 150 parts per million, as calcium carbonate, but it is preferred to use distilled or deionized water and of these, it is preferred to employ deionized water because of the usual absence of copper ions and excessive carbon dioxide content.

The pH of the polar phase is adjusted, if necessary, by addition of either acid or base, so as to produce a desired pH within the range of from about 5 to about 9.5. The pH usually should be from 6 to 9 and is preferably from 8 to 9. Ordinarily, pH adjustment will be made by addition of an alkaline material, such as sodium hydroxide, although other alkalis may also be employed, e.g., triethanolamine, potassium hydroxide, sodium carbonate, or other suitable alkaline material. Acids too, such as HCl or H₂SO₄, may be used to lower high pH's.

Other compounds may also be present in the polar phase to give it special desired properties. A lower polyhydroxy or polycarboxylic alkanolic acid such as citric acid, gluconic acid, glucuronic acid, ascorbic acid or other similar acidic compound, tetrasodium ethylene diamine tetraacetate, trisodium nitrilotriacetate or other chelating or sequestering agent may be present in small quantities. In addition to adjusting the basicity of the polar phase, such agents tie up or sequester interfering ions and thereby promote the production of a crystal clear aqueous phase. They also act to sequester interfering ions which might destabilize the shampoos made according to this invention.

Other adjuvants may also be employed, such as coloring agents, ultraviolet absorbing chemicals, perfumes, dyes, pigments, preservatives, e.g., formaldehyde, and supplemental conditioning agents. Among the supplemental conditioning agents are soluble proteinaceous preparations, e.g., hydrolyzed animal protein. Reducing agents may be employed to remove any free hydrogen peroxide from the amine oxide and surface active agents and subsequently, such reducing agents may be further removed by treatment with compounds which can serve as oxidizing agents. For example, small quantities of sodium sulfite may be employed to remove the oxygen and a small excess, e.g., 0.1 percent excess, is preferred.

The oil phase is composed principally of mineral oil, such as a completely saturated light mineral oil, which is preferably colorless, odorless and tasteless and of U. S. P. grade. This product is preferably obtained by fractionation of paraffinic crude oils to a specific gravity of 0.83 to 0.88 and a viscosity in the range of 55 to 95 Saybolt Universal seconds at 100°F. As was mentioned previously, for best stability of the two-phase shampoo made, the oily phase should be principally comprised of this mineral oil but some animal or vegetable oil, to a small extent, may be added. Among the animal and vegetable oils that may be added or included are olive oil, corn oil, soybean oil, and cottonseed oil. Of course, blends of various mineral oils which result in a product of desired viscosity and density will also be acceptable. Included in the oily or lotion phase may be small amounts of preservatives, although with the quaternary

ammonium compound present these are not essential in the present shampoos.

The hydrocarbon oil has been found to be much more resistant to change in appearance in the present shampoos than vegetable and animal oils and fats. Thus, after lengthy storage at elevated temperatures, there is very little change in appearance of the present shampoo formulations based entirely on the hydrocarbon as the oily constituent of the lipophilic phase, compared to those based on vegetable or animal oils. This does not mean that such oils cannot be employed in the present formulations, where their desired activities are especially useful. However, it must be considered that where color, appearance, clarity or creaminess are of great importance, it will usually be most desirable to omit entirely any animal or vegetable oils or fats or any unsaturated aliphatic oils. Instead of these, one may substitute synthetic oils such as the silicones, polyethers, polyalkoxyalkanols or other equivalent materials, where they are unobjectionable. If vegetable oils are to be employed, they will normally constitute a minor proportion of the oily phase, with the mineral oil being a major proportion thereof. Rarely will the content of such natural oils exceed 40 percent of the oil charged and even if such percentage is employed there might be some detrimental effect on the product.

The upper lotion layer of the shampoos will be mostly mineral oil or a blend of oils, with little of the polar phase ingredients therein except the water. There may be up to 40 percent of the lotion as water, usually 5 to about 25 percent and from 0.1 to 20 percent, preferably from 0.1 to 10 percent of the lotion will be other materials from the polar phase, principally surface active agents, superfatting agents, perfumes, and conditioners. Usually, the mineral oil will be 60 percent or more of the oil in the lotion phase, preferably over 80 percent and most preferably, over 95 percent. Highly paraffinic oils are preferred for stability but those containing some aromatic compounds are also useful and exhibit stability in these formulations.

The lower layer of the shampoo may contain some oil from the upper layer, as a result of equilibrium being established in the product. Ordinarily, less than 10 percent of oil will be in the lower layer and preferably, less than 5 percent. Surprisingly, the aqueous lower portion of the product remains clear despite such oil content.

The adjuvant materials, such as the citric acid, soluble protein, fluorescent brightener, coloring agents, stabilizers and compounds for pH adjustment will be present in minor proportions, sufficient to exert effects desired in the shampoos. Usually, the total amount of such materials will constitute from 1 to 20 percent of the shampoo (including both polar and lipophilic phases), preferably from 1 to 10 percent thereof and usually no more than about 5 percent. For the various individual materials, there will usually be present from 0.1 to 5 percent and it is ordinarily preferred that no more than about 2 percent of any of them be employed. Thus, adjuvants comprise only a small proportion of the present compositions and do not interfere with the desirable activities of the surface active materials, conditioners, oil and solvents.

The ratio of lotion phase to total shampoo composition will normally be from about 5 to 40 percent. It is preferred that this range be from 10 to 30 percent and most preferred compositions include about 12 to 20

percent or about 15 percent of lipophilic phase, measured as oil charged.

The amine oxides comprise from 5 to 25 percent of the polar phase, usually about 6 to 20 percent and most preferably about 6 to 12 percent thereof. The higher alkyl substituted amino-lower alkanolic acids constitute from 1 to 15 percent of the aqueous phase, usually from 2 to 10 percent and preferably from 3 to 8 percent thereof. The alkylolamides comprise from 1 to 6 percent and preferably from 3 to 5 percent of the aqueous portion. The quaternary ammonium compounds are also present to the extent of 0.1 to 10 percent, usually 0.1 to 7 percent and preferably 0.1 to 3 percent of the polar phase. The lower alcohol constitutes from about 2 to 8 percent, preferably 3 to 6 percent and most preferably, about 5 percent of the polar phase. However, by modifying the alcoholic content of the polar phase by addition thereto of other hydroxy-containing materials, such as glycerol or other polyhydric alcohols, the content of lower alcohol may be varied, with the requirement being that it should be present to the extent that it helps to clarify the polar phase and yet maintains its distinctive separation from the upper lotion phase of the shampoos. Water is usually from 60 to 80 percent of the polar phase of the present compositions. It is usually added to the shampoos as deionized water but it may be also present as a solvent or additive with various components of the shampoos. Usually from 65 to 75 percent of water will be present and preferably about 70 percent thereof, in the polar phase.

The above proportions relate to constituents as they are added to the polar phase. It is recognized that some of these materials will to some extent, usually relatively small, be absorbed into the oil phase. However, because of variations in proportions of the absorbed constituents, depending on the compositions of specific shampoos, the proportions given herein are for the most part with respect to the polar and lipophilic phases as they exist prior to mixing. The proportions in the phases will not be greatly changed after mixing but for clarity of description and ready identification of the compositions of the invention it is considered to be most convenient and accurate to describe these materials with respect to the phases before creation of the temporary shampoo emulsion or of the lotion layer.

The invented conditioning two-layer shampoo compositions are made in a very simple and efficient manner. In a preferred method of manufacture, the amine oxide, N-substituted lower aminoalkanoic acid, alkanolamide and quaternary compound, are dissolved in water-alcohol mixture at approximately room temperature, after which the various adjuvants are added thereto. In the event that some of the materials do not dissolve as easily as desirable, heating may be employed, up to about 140°F., although it is preferred that the materials be maintained at about room temperature, usually no higher than 90°F., during the blending operation. After all the polar phase ingredients are mixed together, producing a clear solution, the oil phase is mixed into this, usually with strong stirring, as by a propeller or paddle mixer. A temporary emulsion is formed and the product is immediately bottled, capped and sealed, after which the layers separate, usually within a 24 hour period and preferably within one hour, to give a creamy lotion-like in-water-oil emulsion as the upper phase and a clear polar aqueous solution, as the lower phase. Before blending the amine oxide

with the other component, amphoteric and cationic surface active agents, sodium sulfite may be added thereto in slight excess, to react with any excess hydrogen peroxide present.

Citric acid, often present as a sequestering agent and acidifying agent, may be neutralized and sodium hydroxide, sodium carbonate or other alkaline material, and pH may be adjusted either with acid or base, to that which is desired, preferably about pH 8 or 9. If acid addition is needed to obtain the desired pH, suitable acids are employed, e.g., HCl, H₂SO₄, citric acid, gluconic acid.

The following examples describe preferred embodiments of the present compositions and methods of manufacture. It will be realized that changes may be made in these compositions and procedural steps may be varied, by means of substitution of equivalents or obvious replacements, without departing from the principles of the invention or its spirit. All parts given are by weight, unless otherwise specified.

EXAMPLE 1

	Parts
Myristyl dimethyl amine oxide (30% aqueous solution)	37.3
Deionized water	35.0
Sodium Sulfite	0.15
N-lauryl/myristyl beta-alanine (50% aqueous solution)	5.9
Stearyl amidopropyl dimethyl hydroxyethyl ammonium chloride (30% aqueous solution)	10.6
Citric acid, anhydrous	0.25
Sodium hydroxide (25% aqueous solution)	1.4
Lauric myristic diethanolamide	3.0
Perfume	0.40
Ultraviolet absorber	0.03
Alcohol (SD-40, denatured)	5.0
Formaldehyde	0.10
Hydrochloric acid	q.s.

A solution of the amine oxide in deionized water is treated with the sodium sulfite, to neutralize any excess hydrogen peroxide in the amine oxide. Subsequently, the beta-alanine derivative and quaternary ammonium chloride are mixed together, with heating, and the mixture is blended in with the solution of treated amine oxide. Next, the combination of citric acid, sodium hydroxide and lauric myristic diethanolamide, also heated to about 60°F., is blended with the other components, followed by additions of perfume, brightener, alcohol and formaldehyde. The polar phase so prepared is checked for pH which is found to be about 9.2. Adjustment to pH 9.0 is effected by addition of concentrated hydrochloric acid, in small increments.

The polar phase so prepared is mixed in a propeller mixer with a hydrocarbon oil, which is a light U. S. P. mineral oil, having a specific gravity of about 0.85 and a viscosity of about 75 Saybolt Universal seconds at 100°F. The proportions employed are 85 parts of polar phase and 15 parts mineral oil. It is noted that a temporary emulsion is created, in which the lipophilic and hydrophilic constituents are homogeneously dispersed. The temporary emulsion, created by stirring for about ½ minute, is sufficiently stable to allow the bottling of a homogeneous product but on quiescent standing such product separates out into an upper creamy emulsion phase, which constitutes approximately 20 percent by volume of the product, and a clear lower polar solution. The two phases are sharply divided.

Upon use as a shampoo for human hair, the hair is cleansed effectively, after suitable dilution of the sham-

poo with water, and after washing it is found that the hair has become conditioned by deposit thereon of some oil and parts of the cationic, amphoteric and conditioning constituents of the shampoo. The hair has body and electrostatic charges thereon are diminished, leading to less "flyaway" behavior than exhibited by the hair after washing with a control shampoo.

Examination of particles of the lotion phase indicates that they are in the form of an oil-in-water emulsion, showing that some water from the polar phase has become absorbed into the lotion phase. It is also found that some of the polar phase constituents are also present in minor proportions in the upper phase, and some oil is "dissolved" in the polar phase.

Upon testing for stability in an oven test, at a temperature of 120°F. for 9 months, it is found that the lotion and solution phases are stable. The tested product looks almost the same after such lengthy storage at extreme temperature as when the temporary emulsion is first broken into the lotion and polar phases, after packaging.

In place of the myristyl dimethyl amine oxide there may be substituted other amine oxides, such as lauryl dimethyl amine oxide, myristyl isobutyl methyl amine oxide, and myristyl palmityl propyl amine oxide or mixtures thereof, to obtain successful two-phase lotion-solution shampoos. Also, when the N-lauryl myristyl beta-alanine is replaced with other suitable alkyl substituted amino acids, such as N-decyl palmityl beta-alanine, N-myristyl beta-alanine or N-methyl myristyl beta-alanine, comparable results are achieved. Similarly, when the quaternary is replaced with another suitable one, such as another higher fatty acid amide lower alkyl di-lower alkyl hydroxy-lower alkyl ammonium halide, or when the diethanolamide is changed, good products result.

EXAMPLE 2

	Parts
Tallow fatty acids amidopropyl dimethyl hydroxyethyl ammonium chloride (90% active)	3.3
Deionized water	34.3
Myristyl dimethyl amine oxide (30% active)*	40.0
N-lauryl/myristyl beta-alanine (50% active)*	6.0
Triethanolamine	5.0
Citric acid (anhydrous)	0.3
Hydrolyzed protein (soluble)	1.5
Lauric myristic diethanolamide	3.0
Alcohol (ethanol, SD-40, denatured)	5.0
Perfume	0.4
Fluorescent Brightener (U. V. absorber)	0.03
Dyes (green)	0.2
Sodium hydroxide (19.1% Na ₂ O aqueous solution)	q.s. (to pH 9)

* Balance water

The above phase solution was made by mixing together the various ingredients thereof according to known techniques for preparing solutions, dissolving the surface active materials and the diethanolamide in aqueous alcoholic solution and the rest of the water soluble materials in water and then mixing the two solutions at a sufficiently elevated temperature so that they formed a clear solution. The pH was adjusted by addition of sodium hydroxide until it reached 9.0. The oil phase was prepared by mixing 63.3 parts of light mineral oil and 3.3 parts of U. S. P. olive oil.

Seventeen parts of the polar phase material and 3 parts of the lipophilic blend were mixed together at a temperature of 120°F. for ½ minute and a temporary emulsion was formed. The emulsion was bottled and

allowed to stand overnight, upon which it broke into an upper lotion phase and a lower clear polar phase. It is an excellent high foaming shampoo and cleans and conditions hair washed with it. It maintains its identity as a two-phase lotion-solution shampoo, despite almost a year of storage at elevated temperatures. However, its appearance is not as good as that of a similar shampoo based on mineral oil alone.

Similar results are obtained when the olive oil is replaced with cottonseed oil. Also, such results are obtained when the triethanolamine is replaced with other basic material, such as sodium tripolyphosphate, potassium hydroxide or other equivalent. When the ethanol is replaced by isopropanol and the proportion thereof is changed to either 3 or 6 percent of the polar phase constituents, a good product results. Also, the protein may be omitted without adversely affecting the stability of the product or its appearance. When the olive oil is 25 percent of the oil in this formula stable product results but when increased to 50 percent, the emulsion of the lotion phase is soon broken. In 100 percent mineral oil formulations, the amine oxide (30 percent active) may be decreased to 20 percent, the alanine derivative (50 percent active) may be increased to 16 percent and quaternary ammonium compound (90 percent active) may be diminished to 0.9 percent.

EXAMPLE 3

The procedure of Example 2 is followed but 14 parts of polar phase solution are blended with 6 parts of lipophilic phase materials. The resulting shampoo has a greater creaminess and more lotion phase and has a greater conditioning effect on the hair, after washing. It is of a comparable stability to that of Example 2.

As is seen from the preceding examples the products obtained are of attractive appearance, are stable and are functional, providing excellent conditioning shampoos of distinctive appearance. Strangely enough, the emulsion phase co-exists with a lower solution phase and forms a sharp line of demarcation therewith, while yet being temporarily miscible with it, when desired. These properties are surprising and depend upon employment of the mentioned constituents of the phases in correct proportions. However, it is recognized that substituents may be employed and proportions may be varied in accordance with the teachings herein to obtain such desired compositions. Of course, the present invention is not limited to the specific working examples given or particular materials described to detail in this specification.

What is claimed is:

1. A shampoo composition comprising a lower polar phase comprising an aqueous solution containing from about 0.1 to 10 percent of a quaternary ammonium surface active agent, from about 1 to 15 percent of N-higher alkyl substituted amino -lower alkanolic acid, from about 5 to 25 percent of an alkyl substituted amine oxide, from about 1 to 6 percent of higher fatty acid alkanolamide and from about 2 to 8 percent of lower alcohol and an upper lipophilic lotion phase containing a major proportion of hydrocarbon oil.

2. A shampoo composition according to claim 16 wherein the pH of the polar phase is from about 5 to 9.5.

3. A shampoo composition according to claim 1 wherein the weight ratio of lipophilic lotion phase to

the shampoo composition is within the range of 5 to 40 percent.

4. A shampoo composition according to claim 3 wherein the amine oxide is a higher alkyl di-lower alkyl amine oxide, and comprises from 5 to 25 percent of the polar phase.

5. A shampoo composition according to claim 1 wherein the polar phase contains from 1 to 6 percent of a higher fatty acid di-lower alkanolamide.

6. A shampoo composition according to claim 1 wherein the cationic compound includes at least two lower alkyl groups of 1 to 4 carbon atoms substituted on the quaternary nitrogen and at least one higher fatty alkyl or benzyl radical or said nitrogen.

7. A composition according to claim 6 wherein the lower polar phase includes from 0.1 to 5 percent of a sequestrant and has the pH thereof adjusted to within the range of 5 to 9.5.

8. A shampoo composition according to claim 7 wherein the lipophilic lotion phase includes more than 80% of the oily constituents of the phase as light mineral oil and other non-oily constituents of the lotion are those absorbed from the polar phase, in equilibrium therewith.

9. A shampoo composition in accordance with claim 8 wherein the upper lotion phase is from 10 to 30 percent of the shampoo, the mineral oil is one having a density of within a range of 0.83 to 0.88 g./ml. and a viscosity within the range of 55 to 95 Saybolt Universal seconds at 100°F., and the polar phase comprises 6 to 20 percent of higher alkyl di-lower alkyl mine oxide, wherein the higher alkyl is of 10 to 18 carbon atoms and the lower alkyls are of 1 to 6 carbon atoms, 2-10 percent of N-di-higher alkyl amino alkanolic acid, wherein the higher alkyl is of 10 to 18 carbon atoms and the lower alkanolic acid is from 2 to 6 carbon atoms, 3 to 5 percent of higher fatty acid dialkanolamide, wherein the higher fatty acid is of 10 to 16 carbon atoms and the alkanols are of 1 to 4 carbon atoms, 0.1 to 7 percent of a quaternary ammonium compound wherein the nitrogen is substituted by two lower alkyl groups of 1 to 4 carbon atoms and one higher fatty alkyl group of 10 to 18 carbon atoms, 2 to 8 percent lower alcohol, 60 to 80 percent water, and the pH thereof is from 6 to 9.

10. A shampoo composition according to claim 9 wherein the upper lotion phase is from 12 to 20 percent of the shampoo and the polar phase comprises 6 to 12 percent of myristyl dimethyl amine oxide, 3 to 8 percent of N-higher fatty alkyl beta-alanine, wherein the higher fatty alkyl is of 12 to 14 carbon atoms, 3 to 5 percent of lauric myristic diethanolamide, 0.1 to 3 percent of tallow amidopropyl dimethyl hydroxyethyl ammonium chloride, about 5 percent of ethanol, and about 70 percent water.

11. A shampoo composition in accordance with claim 10, in which the polar phase contains 0.1 to 2 percent of sodium citrate, as a sequestrant, 0.1 to 2 percent of hydrolyzed protein, 0.1 to 2 percent of perfume, and coloring agent, with the total of sequestrant, protein, perfume and coloring agent being less than 5 percent of the polar phase.

12. A method of preparing the shampoo composition of claim 16 which comprises forming a water solution of quaternary ammonium surface active agent, N-higher alkyl substituted amino -lower alkanolic acid, alkyl-substituted amine oxide, higher fatty acid alkanola-

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mid and lower alcohol, admixing with said solution an oil phase composition containing a major proportion of hydrocarbon oil for a time sufficient to form a temporary emulsion of the oily material in the polar solution, and allowing said emulsion to settle whereby to form separate upper lotion and lower polar phases.

13. A method of washing hair which comprises shaking the composition of claim 1 to form a temporary

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emulsion in which the components of the phases are homogeneously distributed, applying said temporary emulsion to the hair, diluting the emulsion with water and washing hair therewith, whereby the hair is cleansed by the surface active components of the shampoo and is conditioned by the hydrocarbon oil.

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