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(54) **Title:** CONDITIONING AGENTS FOR PERSONAL CARE COMPOSITIONS

(57) **Abstract:** An emollient represented by the formula $R_1COOC(C)_nCR_2OR_3$ wherein: R_1 is $CH_3(CH_2)_m$ and may be interrupted with at least one heteroatom selected from the group consisting of amine, ether, ester, amide, sulfur, sulfur monoxide, sulfur dioxide, sulfamate, hydroxy, or mixtures thereof; and $m = 6-16$; $n = 0$ or 1 ; $R_2 = H$ or CH_3 ; and $R_3 = CO(CH_2)COOH$ or $CO(CH_2)_2COOH$.



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CONDITIONING AGENTS FOR PERSONAL CARE COMPOSITIONS

CROSS-REFERENCE TO RELATED APPLICATIONS

5 The present application claims priority from U.S. Provisional Application No. 61/475,145, filed April 13, 2011.

FIELD OF THE INVENTION

10 This invention relates to new mild conditioning agents. In particular, the invention relates to a novel emollient which may be derived from natural feedstocks.

BACKGROUND OF THE INVENTION

15 The development of cleansing products (including, without limitation, liquid hand soaps, body washes, shampoos, bath washes, hair conditioners, liquid dish detergents, car wash detergents, and the like) has long been driven by the challenge of providing a combination of performance properties such as good foaming, good cleansing, good rinsing, enhanced mildness, and improved skin feel. This combination of properties is even more
20 challenging to provide in clear cleansing products, which are highly desired. Often the addition of a component to a cleansing composition formulation may enhance one property to the detriment of another desired property of the composition. For example, a composition may enhance skin conditioning by incorporating emollients at the expense of foaming. Therefore, those in the relevant art have been seeking new formulations to help achieve the balance of
25 desirable performance properties.

 Examples of developments in cleansing formulations seeking to balance low irritation, good tactile characteristics, good foaming, and good cleansing include U.S. Pat. No. 4,664,835 to Grollier et al., which describes a washing and cleansing formulation containing a synthetic surfactant and an anionic polymer; U.S. Pat. No. 5,646,100 to Haugk et al., which describes a
30 liquid personal cleansing formulation containing an anionic surfactant, a betaine, and an alkyl polyglycoside; and U.S. Pat. No. 5,310,508 to Subramanyam et al., which describes a personal cleansing composition containing a salt of alcohol ethoxy glyceryl sulfonate ("AGS") and a second synthetic surfactant.

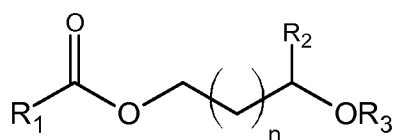
It is well known that a liquid cleansing composition is typically aqueous and comprises one or more mild deterative surfactants and/or soaps. For example, conventional hand cleansers, body washes, shampoos, or liquid soap typically comprise a synthetic deterative and/or fatty acid soap and one or more foam stabilizing, wetting, or emulsifying surfactants.

5 However, cleansing compositions based on synthetic detergents often impart poor skin feel during and after use, and require additives to improve such tactile aspects of performance. One known emollient for improving skin feel and softness is polyethylene glycol-7 glyceryl cocoate (PEG-7 glyceryl cocoate), which is a polyethylene glycol ether of glyceryl cocoate containing an average of 7 moles of ethylene oxide. PEG-7 glyceryl cocoate is commercially
10 available from a number of sources, such as Croda, Inc., under the trade name Glycerox HE, Cognis Corporation, under the trade name Cetiol HE, and Degussa Care Specialties, under the trade name Tegosoft GC. Although the incorporation of such an emollient may help to improve skin feel in cleansing compositions, it may not contribute to other necessary properties, such as attractive product appearance and viscosity, and may have a negative effect
15 on foaming. Thus, additional components, such as foam builders and viscosity builders, may need to be incorporated into the cleansing compositions, which can lead to an increased cost in producing such compositions. Further, at concentrations higher than about 2% by weight, PEG-7 glyceryl cocoate may be difficult to mix into aqueous systems, especially at ambient temperatures, which may require more elaborate and/or costly mixing procedures to produce
20 the cleansing compositions.

Despite these developments, there remains a need for a cleansing formulation that provides enhanced skin feel, low skin irritation, low skin drying, good cleansing ability, good foaming, and good rinsability characteristics/properties, especially in a clear cleansing product. There also remains a need for a cleansing formulation that utilizes components that
25 are multi-functional, thereby obtaining a desired balance of properties with fewer components, which result in lower costs of production.

SUMMARY OF THE INVENTION

30 The invention herein relates to an emollient represented by the formula:



wherein:

R_1 is $\text{CH}_3(\text{CH}_2)_m$ and may be interrupted with at least one heteroatom selected from the group consisting of amine, ether, ester, amide, sulfur, sulfur monoxide, sulfur dioxide, sulfamate, hydroxy, or mixtures thereof; and

$m = 6-16$

$n = 0$ or 1

$R_2 = \text{H}$ or CH_3 ; and

$R_3 = \text{CO}(\text{CH}_2)\text{COOH}$ or $\text{CO}(\text{CH}_2)_2\text{COOH}$.

The invention further relates to methods of making the emollient herein, as well as to compositions comprising the emollient and uses thereof.

DETAILED DESCRIPTION

While the specification concludes with claims that particularly point out and distinctly claim the invention, it is believed the present invention will be better understood from the following description.

All percentages, parts and ratios are based upon the total weight of the compositions of the present invention, unless otherwise specified. All such weights as they pertain to listed ingredients are based on the active level, and, therefore, do not include solvents or by-products that may be included in commercially available materials, unless otherwise specified. The term "weight percent" may be denoted as "wt.%" herein.

All molecular weights as used herein are weight average molecular weights expressed as grams/mole, unless otherwise specified.

Herein, "comprising" means that other steps and other ingredients which do not affect the end result can be added. This term encompasses the terms "consisting of" and "consisting essentially of". The compositions and methods/processes of the present invention can comprise, consist of, and consist essentially of the essential elements and limitations of the invention described herein, as well as any of the additional or optional ingredients, components, steps, or limitations described herein.

The term "charge density", as used herein, refers to the ratio of the number of positive charges on a monomeric unit of which a polymer is comprised to the molecular weight of said

monomeric unit. The charge density multiplied by the polymer molecular weight determines the number of positively charged sites on a given polymer chain.

The term “personal care composition” as used herein, unless otherwise specified, refers to the compositions of the present invention, wherein the compositions are intended to include only those compositions for topical application to the hair or skin, and specifically excludes those compositions that are directed primarily to other applications such as hard surface cleansing, fabric or laundry cleansing, and similar other applications not intended primarily for topical application to the hair or skin.

The term “polymer” as used herein shall include materials whether made by polymerization of one type of monomer or made by two (*i.e.*, copolymers) or more types of monomers.

The term “solid particle” as used herein means a particle that is not a liquid or a gas.

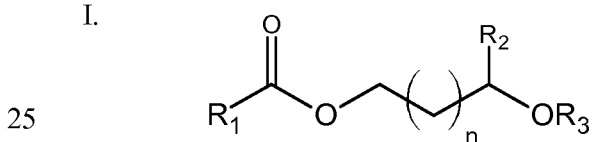
The term “water-soluble” as used herein, means that the polymer is soluble in water in the present composition. In general, the polymer should be soluble at 25°C at a concentration of at least 0.1% by weight of the water solvent, preferably at least 1%, more preferably at least 5%, most preferably at least 15%.

The term “water-insoluble” as used herein, means that a compound is not soluble in water in the present composition. Thus, the compound is not miscible with water.

Emollient

The emollients herein conform to the general formula I:

I.



wherein:

R_1 is $\text{CH}_3(\text{CH}_2)_m$ and may be interrupted with at least one heteroatom selected from the group consisting of amine, ether, ester, amide, sulfur, sulfur monoxide, sulfur dioxide, sulfamate, hydroxy, or mixtures thereof; and

$m = 6-16$

$n = 0$ or 1

$\text{R}_2 = \text{H}$ or CH_3 ; and

$\text{R}_3 = \text{CO}(\text{CH}_2)_2\text{COOH}$ or $\text{CO}(\text{CH}_2)_2\text{COOH}$.

In one embodiment, R₁ may be branched, alkyl, or alkenyl. If R₁ is alkenyl, it preferably comprises no more than one double bond. While "m" may be C₆ to C₁₆, it is more preferably C₈ to C₁₄, and most preferably from C₁₀ to C₁₂.

5 The emollients herein may be formed according to the synthesis techniques described in U.S. Patent Publication Numbers 2008/0051592 and 2008/0319236.

10 While the emollients herein may be derived from traditional petrochemical sources, in one embodiment, the emollients may be derived from natural sources and considered "green" and environmentally friendly. For the purpose of this invention the term "naturally derived" means that the emollients herein, as well as the raw materials from which the emollients are obtained, have not previously been grown in or treated with petrochemical materials such a petrochemical solvents. It also means that the initial sources of the raw materials or the emollients are not petrochemicals. Petroleum oils are, of course, naturally occurring materials. But the term "natural" is used herein to exclude materials which have been produced with or treated by synthetic or petrochemical chemicals such as solvents. While the emollients herein may be combined with other synthetic or petrochemical-based ingredients and surfactants, in one embodiment, the emollients *per-se* may be considered to be naturally derived.

15 The emollients herein are suitable for various personal care compositions. For example, the surfactants may be present in body washes, shampoos, facial cleansers, and other compositions used in the home or on the body. Since the compositions are believed to be particularly mild to the skin, body washes and shampoos are particularly well suited for such emollients. When formulated in a personal care composition, the emollients may be present at a level of from about .5% to about 25%, preferably from about .8% to about 20%, and most preferably from about 1% to about 15%.

25 In one embodiment, the emollients may be present in a single phase or in a visually distinct multi-phase personal care composition. At least one of the visually distinct phases may comprise a cleansing phase which includes a surfactant component. The surfactant component may comprise one or more surfactants, and the multiple phases may be in physical contact with one another. Such multi-phase compositions are described in U.S. Patent Application Number 2005/0192187.

30

Surfactant Component

The personal care composition may comprise from about 1% to about 30%, by weight of the personal care composition, of a surfactant component. In some embodiments, the personal care composition comprises from about 3% to about 22%, by weight of the personal

care composition, of a surfactant component comprising an anionic surfactant. In some
embodiments, the personal care composition comprises from about 5% to 15%, by weight of
the personal care composition, of the surfactant component. In some embodiments, the
personal care composition comprises from about 10% to about 15%, by weight of the personal
5 care composition, of a surfactant component. In some embodiments, the surfactant component
comprises a mixture of surfactants selected from anionic surfactants, amphoteric surfactants,
zwitterionic surfactants, cationic surfactants, nonionic surfactants and mixtures thereof.
Suitable surfactants for the personal care composition are described in McCutcheon's:
Detergents and Emulsifiers North American Edition (Allured Publishing Corporation 1947)
10 (1986), McCutcheon's, Functional Materials North American Edition (Allured Publishing
Corporation 1973) (1992) and U.S. Patent No. 3,929,678 (filed Aug. 1, 1974).

In some embodiments, the surfactant component is an isotropic composition. In some
embodiments, the surfactant component is structured such that the resultant personal care
composition is a lamellar composition, or is at least partly present in the lamellar phase.

15 The anionic surfactants, in some embodiments, comprise reaction products of fatty
acids esterified with isethionic acid and neutralized with sodium hydroxide. In some
embodiments, the surfactant component comprises from about 0.1% to about 50%;
alternatively, from about 0.5% to about 10%, by weight of the personal care composition, of
amphoteric or zwitterionic surfactants. Suitable amphoteric or zwitterionic or amphoteric
20 surfactants, in some embodiments, comprise those described in U.S. Patent No. 5,104,646
(filed July 16, 1990) and U.S. Patent No. 5,106,609 (July 16, 1990). The amphoteric
surfactants, in some embodiments, comprise those surfactants broadly described as comprising
aliphatic groups and secondary or tertiary amines in which the aliphatic moieties can be
straight or branched chain and wherein one of the aliphatic substituent contain from about 8 to
25 about 18 carbon atoms and one contains an anionic water solubilizing group such as carboxy,
sulfonate, sulfate, phosphate, or phosphonate. The zwitterionic surfactants, in some
embodiments, comprise those surfactants broadly described as comprising aliphatic groups
and quaternary ammonium, phosphonium, and sulfonium compounds, in which the aliphatic
groups can be straight or branched chain, and wherein one of the aliphatic substituents
30 contains from about 8 to about 18 carbon atoms and contains an anionic group such as
carboxy, sulfonate, sulfate, phosphate or phosphonate. In some embodiments, the zwitterionic
surfactant comprises a betaine.

In some embodiments, the amphoteric or zwitterionic surfactant is selected from
cocoamidopropyl betaine, lauramidopropyl betaine, coco betaine, lauryl betaine,

cocoamphoacetate, cocoamphodiacetate, lauroamphoacetate, lauroamphodiacetate, lauramine oxide, sarcosinate, glutamate, lactate and mixtures thereof. The surfactant component, in some embodiments, comprise cationic surfactants that comprise amino or quaternary ammonium hydrophilic moieties which are positively charged when dissolved in the personal care

5 composition of the present invention. Cationic surfactants are disclosed in Schwartz, et al., Surface Active Agents, Their Chemistry and Technology (Interscience Publishers) (1949); U. S. Patent No. 3,155,591 (filed Dec. 6, 1961); U.S. Patent. No. 3,929,678 (filed Aug. 1, 1974); U.S. Patent No. 3,959,461 (filed May 28, 1974) and U. S. Patent No. 4,387,090 (filed Feb. 13, 1981).

10 In some embodiments, the surfactant component comprises non-ionic surfactants selected from cocoamide monoethanolamine, lauramide monoethanolamine, cocoyl glucosides, lauryl glucosides, decyl glucosides, other alkyl glucosides, trideceth-1, trideceth-3 from EXXAL® 23 and laureth 1, -2, -3, -4 and -5, alkyl ethoxylates from linear, branched, and unsaturated hydrocarbons.

15 In some embodiments, the surfactant component comprises the surfactants, selected from ammonium lauryl sulfate, ammonium laureth sulfate, triethylamine lauryl sulfate, triethylamine laureth sulfate, triethanolamine lauryl sulfate, triethanolamine laureth sulfate, monoethanolamine lauryl sulfate, monoethanolamine laureth sulfate, diethanolamine lauryl sulfate, diethanolamine laureth sulfate, lauric monoglyceride sodium sulfate, sodium lauryl sulfate, sodium laureth sulfate, potassium lauryl sulfate, potassium laureth sulfate, sodium lauryl sarcosinate, sodium lauroyl sarcosinate, lauryl sarcosine, cocoyl sarcosine, ammonium cocoyl sulfate, ammonium lauroyl sulfate, sodium cocoyl sulfate, sodium lauroyl sulfate, potassium cocoyl sulfate, potassium lauryl sulfate, triethanolamine lauryl sulfate, triethanolamine lauryl sulfate, monoethanolamine cocoyl sulfate, monoethanolamine lauryl sulfate, sodium tridecyl benzene sulfonate, sodium dodecyl benzene sulfonate, cocamidopropyl betaine, sodium lauroamphoacetate, alkyl glyceryl ether sulfonate, and mixtures thereof.

Cosmetically Acceptable Medium

30 Embodiments including the surfactant as a component of a personal care composition comprise a cosmetically acceptable medium. The level and species of the medium are selected according to the compatibility with other components and other desired characteristic of the product. Generally, the cosmetically acceptable medium is present in an amount from about 20% to about 95% by weight of the composition. A cosmetically acceptable medium may be

selected such that the composition of the present invention may be in the form of, for example, a pourable liquid, a gel, a paste, a dried powder, or a dried film.

Cosmetically acceptable mediums useful in the present invention include water and water solutions of lower alkyl alcohols. Lower alkyl alcohols useful herein are monohydric
5 alcohols having 1 to 6 carbons, and preferably are selected from ethanol and isopropanol.

In cosmetic applications, the pH of the present composition, measured neat, is preferably from about 3 to about 9, more preferably from about 4 to about 8.

In automatic dishwashing compositions, the pH may be from about 7 to about 13, more preferably from about 8 to about 12, and most preferably from about 9 to about 10.

10 Buffers and other pH-adjusting agents can be included to achieve the desirable pH.

Oily Conditioning Agent

In a preferred embodiment of the present invention, the personal care compositions comprise one or more oily conditioning agents. Oily conditioning agents include materials
15 which are used to give a particular conditioning benefit to hair and/or skin. In hair treatment compositions, suitable conditioning agents are those which deliver one or more benefits relating to shine, softness, combability, antistatic properties, wet-handling, damage, manageability, body, and greasiness. The oily conditioning agents useful in the compositions of the present invention typically comprise a water-insoluble, water-dispersible, non-volatile,
20 liquid that forms emulsified, liquid particles. Suitable oily conditioning agents for use in the composition are those conditioning agents characterized generally as silicones (*e.g.*, silicone oils, cationic silicones, silicone gums, high refractive silicones, and silicone resins), organic conditioning oils (*e.g.*, hydrocarbon oils, polyolefins, and fatty esters) or combinations thereof, or those conditioning agents which otherwise form liquid, dispersed particles in the
25 aqueous surfactant matrix herein.

One or more oily conditioning agents are typically present at a concentration from about 0.01% to about 10%, preferably from about 0.1% to about 8%, more preferably from about 0.2% to about 4%, by weight of the composition.

30 Silicone Conditioning Agent

The invention herein may include one or more oily conditioning agents. Such oily conditioning agents may include a water-soluble silicone conditioning agent. The silicone conditioning agent may comprise volatile silicone, non-volatile silicone, or combinations thereof. Preferred are non-volatile silicone conditioning agents. If volatile silicones are pres-
35 ent, it will typically be incidental to their use as a solvent or carrier for commercially available

forms of non-volatile silicone materials ingredients, such as silicone gums and resins. The silicone conditioning agent particles may comprise a silicone fluid conditioning agent and may also comprise other ingredients, such as a silicone resin to improve silicone fluid deposition efficiency or enhance glossiness of the hair.

5 Non-limiting examples of suitable silicone conditioning agents, and optional suspending agents for the silicone, are described in U.S. Reissue Pat. No. 34,584, U.S. Pat. No. 5,104,646, and U.S. Pat. No. 5,106,609. The silicone conditioning agents for use in the compositions of the present invention preferably have a viscosity, as measured at 25°C, from about 20 to about 2,000,000 centistokes (“csk”), more preferably from about 1,000 to about 10 1,800,000 csk, even more preferably from about 5,000 to about 1,500,000 csk, more preferably from about 10,000 to about 1,000,000 csk.

In an embodiment including a generally opaque composition, the personal care composition comprises a non-volatile silicone oil having a particle size as measured in the personal care composition from about 1 µm to about 50 µm. In an embodiment which may be 15 transparent, translucent, or opaque, the personal care composition comprises a non-volatile silicone oil having a particle size as measured in the personal care composition from about 100 nm to about 1 µm. One embodiment comprises a non-volatile silicone oil having a particle size as measured in the personal care composition of less than about 100 nm.

Non-volatile silicone oils suitable for use in the compositions may be selected from 20 organo-modified silicones and fluoro-modified silicones. In one embodiment of the present invention, the non-volatile silicone oil is an organo-modified silicone which comprises an organo group selected from the group consisting of alkyl groups, alkenyl groups, hydroxyl groups, amine groups, quaternary groups, carboxyl groups, fatty acid groups, ether groups, ester groups, mercapto groups, sulfate groups, sulfonate groups, phosphate groups, propylene 25 oxide groups, and ethylene oxide groups.

In a preferred embodiment of the present invention, the non-volatile silicone oil is dimethicone.

Background material on silicones including sections discussing silicone fluids, gums, and resins, as well as manufacture of silicones, are found in *Encyclopedia of Polymer Science* 30 *and Engineering*, vol. 15, 2d ed., pp 204-308, John Wiley & Sons, Inc. (1989).

Silicone fluids suitable for use in the compositions of the present invention are disclosed in U.S. Pat. No. 2,826,551, U.S. Pat. No. 3,964,500, U.S. Pat. No. 4,364,837, British Pat. No. 849,433, and *Silicon Compounds*, Petrarch Systems, Inc. (1984).

Organic Conditioning Oils

The oily conditioning agent may also comprise at least one organic conditioning oil, either alone or in combination with other conditioning agents, such as the silicones described above.

5

Hydrocarbon Oils

Suitable organic conditioning oils for use as conditioning agents in the compositions of the present invention include, but are not limited to, hydrocarbon oils having at least about 10 carbon atoms, such as cyclic hydrocarbons, straight chain aliphatic hydrocarbons (saturated or
10 unsaturated), and branched chain aliphatic hydrocarbons (saturated or unsaturated), including polymers and mixtures thereof. Straight chain hydrocarbon oils preferably are from about C₁₂ to about C₁₉. Branched chain hydrocarbon oils, including hydrocarbon polymers, typically will contain more than 19 carbon atoms.

Specific non-limiting examples of these hydrocarbon oils include paraffin oil, mineral
15 oil, saturated and unsaturated dodecane, saturated and unsaturated tridecane, saturated and unsaturated tetradecane, saturated and unsaturated pentadecane, saturated and unsaturated hexadecane, polybutene, polydecene, and mixtures thereof. Branched-chain isomers of these compounds, as well as of higher chain length hydrocarbons, can also be used, examples of which include 2, 2, 4, 4, 6, 6, 8, 8-dimethyl-10-methylundecane and 2, 2, 4, 4, 6, 6-dimethyl-8-
20 methylnonane, available from Permethyl Corporation. A preferred hydrocarbon polymer is polybutene, such as the copolymer of isobutylene and butene, which is commercially available as L-14 polybutene from Amoco Chemical Corporation.

Polyolefins

25 Organic conditioning oils can also include liquid polyolefins, more preferably liquid poly- α -olefins, more preferably hydrogenated liquid poly- α -olefins. Polyolefins for use herein are prepared by polymerization of C₄ to about C₁₄ olefinic monomers, preferably from about C₆ to about C₁₂.

Non-limiting examples of olefinic monomers for use in preparing the polyolefin
30 liquids herein include ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 1-octene, 1-decene, 1-dodecene, 1-tetradecene, branched chain isomers such as 4-methyl-1-pentene, and mixtures thereof. Also suitable for preparing the polyolefin liquids are olefin-containing refinery feedstocks or effluents.

Fatty Esters

Other suitable organic conditioning oils include fatty esters having at least 10 carbon atoms. These fatty esters include esters with hydrocarbyl chains derived from fatty acids or alcohols. The hydrocarbyl radicals of the fatty esters hereof may include or have covalently bonded thereto other compatible functionalities, such as amides and alkoxy moieties (e.g., ethoxy or ether linkages, *etc.*).

Specific examples of preferred fatty esters include, but are not limited to, isopropyl isostearate, hexyl laurate, isohexyl laurate, isohexyl palmitate, isopropyl palmitate, decyl oleate, isodecyl oleate, hexadecyl stearate, decyl stearate, isopropyl isostearate, dihexyldecyl adipate, lauryl lactate, myristyl lactate, cetyl lactate, oleyl stearate, oleyl oleate, oleyl myristate, lauryl acetate, cetyl propionate, and oleyl adipate.

Other fatty esters suitable for use in the compositions of the present invention are those known as polyhydric alcohol esters. Such polyhydric alcohol esters include alkylene glycol esters.

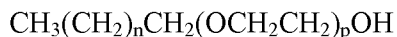
Still other fatty esters suitable for use in the compositions of the present invention are glycerides, including, but not limited to, mono-, di-, and tri-glycerides, preferably di- and tri-glycerides, more preferably triglycerides. A variety of these types of materials can be obtained from vegetable and animal fats and oils, such as castor oil, safflower oil, cottonseed oil, corn oil, olive oil, cod liver oil, almond oil, avocado oil, palm oil, sesame oil, lanolin and soybean oil. Synthetic oils include, but are not limited to, triolein and tristearin glyceryl dilaurate.

Fluorinated Conditioning Compounds

Fluorinated compounds suitable for delivering conditioning to hair or skin as organic conditioning oils include perfluoropolyethers, perfluorinated olefins, fluorine based specialty polymers that may be in a fluid or elastomer form similar to the silicone fluids previously described, and perfluorinated dimethicones. Specific non-limiting examples of suitable fluorinated compounds include the Fomblin product line from Ausimont which includes HC/04, HC/25, HC01, HC/02, HC/03; Dioctyldodecyl Fluoroethyl Citrate, commonly called Biosil Basics Fluoro Gerbet 3.5 supplied by Biosil Technologies; and Biosil Basics Fluorosil LF also supplied by Biosil Technologies.

Fatty Alcohols

Other suitable organic conditioning oils for use in the personal care compositions of the present invention include, but are not limited to, fatty alcohols having at least about 10 carbon atoms, more preferably about 10 to about 22 carbon atoms, most preferably about 12 to about 16 carbon atoms. Also suitable for use in the personal care compositions of the present inventions are alkoxylated fatty alcohols which conform to the general formula:



wherein n is a positive integer having a value from about 8 to about 20, preferably about 10 to about 14, and p is a positive integer having a value from about 1 to about 30, preferably from about 2 to about 23.

Alkyl Glucosides and Alkyl Glucoside Derivatives

Suitable organic conditioning oils include, but are not limited to, alkyl glucosides and alkyl glucoside derivatives. Specific non-limiting examples of suitable alkyl glucosides and alkyl glucoside derivatives include Glucam E-10, Glucam E-20, Glucam P-10, and Glucquat 125 commercially available from Amerchol.

Other Conditioning Agents

Quaternary Ammonium Compounds

Suitable quaternary ammonium compounds include, but are not limited to, hydrophilic quaternary ammonium compounds with a long chain substituent having a carbonyl moiety, like an amide moiety, or a phosphate ester moiety or a similar hydrophilic moiety.

Examples of useful hydrophilic quaternary ammonium compounds include, but are not limited to, compounds designated in the CTFA Cosmetic Dictionary as ricinoleamidopropyl trimonium chloride, ricinoleamido trimonium ethylsulfate, hydroxy stearamidopropyl trimoniummethysulfate and hydroxy stearamidopropyl trimonium chloride, or combinations thereof.

Examples of other useful quaternary ammonium surfactants include, but are not limited to, Quaternium-33, Quaternium-43, isostearamidopropyl ethyldimonium ethosulfate, Quaternium-22 and Quaternium-26, or combinations thereof, as designated in the CTFA Dictionary.

Other hydrophilic quaternary ammonium compounds useful in a composition of the present invention include, but are not limited to, Quaternium-16, Quaternium-27, Quaternium-

30, Quaternium-52, Quaternium-53, Quaternium-56, Quaternium-60, Quaternium-61, Quaternium-62, Quaternium-63, Quaternium-71, and combinations thereof.

Polyethylene Glycols

5 Additional compounds useful herein as conditioning agents include polyethylene glycols and polypropylene glycols having a molecular weight of up to about 2,000,000 such as those with CTFA names PEG-200, PEG-400, PEG-600, PEG-1000, PEG-2M, PEG-7M, PEG-14M, PEG-45M and mixtures thereof.

10 Additional Components

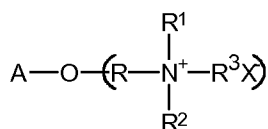
The personal care compositions may further comprise one or more additional components known for use in hair care or personal care products, provided that the additional components are physically and chemically compatible with the essential components described herein, or do not otherwise unduly impair product stability, aesthetics or
15 performance. Individual concentrations of such additional components may range from about 0.001% to about 10% by weight of the personal care compositions.

Non-limiting examples of additional components for use in the composition include natural cationic deposition polymers, synthetic cationic deposition polymers, anti-dandruff agents, particles, suspending agents, paraffinic hydrocarbons, propellants, viscosity modifiers,
20 dyes, non-volatile solvents or diluents (water-soluble and water-insoluble), pearlescent aids, foam boosters, additional surfactants or nonionic cosurfactants, pediculicides, pH adjusting agents, perfumes, preservatives, chelants, proteins, skin active agents, sunscreens, UV absorbers, and vitamins.

25 Cellulose or Guar Cationic Deposition Polymers

The personal care compositions of the present invention may also include cellulose or guar cationic deposition polymers. Generally, such cellulose or guar cationic deposition polymers may be present at a concentration from about 0.05% to about 5%, by weight of the composition. Suitable cellulose or guar cationic deposition polymers have a molecular weight
30 of greater than about 5,000. Additionally, such cellulose or guar deposition polymers have a charge density from about 0.5 meq/g to about 4.0 meq/g at the pH of intended use of the personal care composition. The pH of the compositions of the present invention are measured neat.

Suitable cellulose or guar cationic polymers include those which conform to the
35 following formula:



wherein A is an anhydroglucose residual group, such as a cellulose anhydroglucose residual; R is an alkylene oxyalkylene, polyoxyalkylene, or hydroxyalkylene group, or combination thereof; R¹, R², and R³ independently are alkyl, aryl, alkylaryl, arylalkyl, alkoxyalkyl, or alkoxyaryl groups, each group containing up to about 18 carbon atoms, and the total number of carbon atoms for each cationic moiety (*i.e.*, the sum of carbon atoms in R¹, R² and R³) preferably being about 20 or less; and X is an anionic counterion. Non-limiting examples of such counterions include halides (*e.g.*, chlorine, fluorine, bromine, iodine), sulfate and methylsulfate. The degree of cationic substitution in these polysaccharide polymers is typically from about 0.01 to about 1 cationic groups per anhydroglucose unit.

In one embodiment of the invention, the cellulose or guar cationic polymers are salts of hydroxyethyl cellulose reacted with trimethyl ammonium substituted epoxide, referred to in the industry (CTFA) as Polyquaternium 10 and available from Amerchol Corp. (Edison, N.J., USA).

Synthetic Cationic Deposition Polymers

The personal care compositions of the present invention may also include synthetic cationic deposition polymers. Generally, such synthetic cationic deposition polymers may be present at a concentration from about 0.025% to about 5%, by weight of the composition. Such synthetic cationic deposition polymers have a molecular weight from about 1,000 to about 5,000,000. Additionally, such synthetic cationic deposition polymers have a charge density from about 0.5 meq/g to about 10 meq/g.

Suitable synthetic cationic deposition polymers include those which are water-soluble or dispersible, cationic, non-crosslinked, conditioning copolymers comprising: (i) one or more cationic monomer units; and (ii) one or more nonionic monomer units or monomer units bearing a terminal negative charge; wherein said copolymer has a net positive charge, a cationic charge density of from about 0.5 meq/g to about 10 meq/g, and an average molecular weight from about 1,000 to about 5,000,000.

Non-limiting examples of suitable synthetic cationic deposition polymers are described in United States Patent Application Publication US 2003/0223951 A1 to Geary et al.

Anti-Dandruff Actives

The compositions may also contain an anti-dandruff active. Suitable non-limiting examples of anti-dandruff actives include pyridinethione salts, azoles, selenium sulfide, particulate sulfur, keratolytic agents, and mixtures thereof. Such anti-dandruff actives should
5 be physically and chemically compatible with the essential components of the composition, and should not otherwise unduly impair product stability, aesthetics or performance.

Pyridinethione anti-microbial and anti-dandruff agents are described, for example, in U.S. Pat. No. 2,809,971; U.S. Pat. No. 3,236,733; U.S. Pat. No. 3,753,196; U.S. Pat. No. 3,761,418; U.S. Pat. No. 4,345,080; U.S. Pat. No. 4,323,683; U.S. Pat. No. 4,379,753; and
10 U.S. Pat. No. 4,470,982.

Azole anti-microbials include imidazoles such as climbazole and ketoconazole.

Selenium sulfide compounds are described, for example, in U.S. Pat. No. 2,694,668; U.S. Pat. No. 3,152,046; U.S. Pat. No. 4,089,945; and U.S. Pat. No. 4,885,107.

Sulfur may also be used as a particulate anti-microbial/anti-dandruff agent in the anti-
15 microbial compositions of the present invention.

The present invention may further comprise one or more keratolytic agents such as Salicylic Acid.

Additional anti-microbial actives of the present invention may include extracts of melaleuca (tea tree) and charcoal.

20 When present in the composition, the anti-dandruff active is included in an amount from about 0.01% to about 5%, preferably from about 0.1% to about 3%, and more preferably from about 0.3 % to about 2%, by weight of the composition.

Particles

25 The compositions of the present invention optionally may comprise particles. Particles useful in the present invention can be inorganic, synthetic, or semi-synthetic. In the compositions of the present invention, it is preferable to incorporate no more than about 20%, more preferably no more than about 10% and even more preferably no more than 2%, by weight of the composition, of particles. In an embodiment of the present invention, the
30 particles have an average mean particle size of less than about 300 μm .

Non-limiting examples of inorganic particles include colloidal silicas, fumed silicas, precipitated silicas, silica gels, magnesium silicate, glass particles, talcs, micas, sericites, and various natural and synthetic clays including bentonites, hectorites, and montmorillonites.

Examples of synthetic particles include silicone resins, poly(meth)acrylates, polyethylene, polyester, polypropylene, polystyrene, polyurethane, polyamide (*e.g.*, Nylon®), epoxy resins, urea resins, acrylic powders, and the like.

Non-limiting examples of hybrid particles include sericite & crosslinked polystyrene
5 hybrid powder, and mica and silica hybrid powder.

Opacifying Agents

The compositions of the present invention may also contain one or more opacifying agents. Opacifying agents are typically used in cleansing compositions to impart desired
10 aesthetic benefits to the composition, such as color or pearlescence. In the compositions of the present invention, it is preferable to incorporate no more than about 20%, more preferably no more than about 10% and even more preferably no more than 2%, by weight of the composition, of opacifying agents.

Suitable opacifying agents include, for example, fumed silica, polymethyl-
15 methacrylate, micronized Teflon®, boron nitride, barium sulfate, acrylate polymers, aluminum silicate, aluminum starch octenylsuccinate, calcium silicate, cellulose, chalk, corn starch, diatomaceous earth, Fuller's earth, glyceryl starch, hydrated silica, magnesium carbonate, magnesium hydroxide, magnesium oxide, magnesium trisilicate, maltodextrin, microcrystalline cellulose, rice starch, silica, titanium dioxide, zinc laurate, zinc myristate, zinc
20 neodecanoate, zinc rosinate, zinc stearate, polyethylene, alumina, attapulgite, calcium carbonate, calcium silicate, dextran, nylon, silica silylate, silk powder, soy flour, tin oxide, titanium hydroxide, trimagnesium phosphate, walnut shell powder, or mixtures thereof. The above mentioned powders may be surface treated with lecithin, amino acids, mineral oil, silicone oil, or various other agents either alone or in combination, which coat the powder
25 surface and render the particles hydrophobic in nature.

The opacifying agents may also comprise various organic and inorganic pigments. The organic pigments are generally various aromatic types including azo, indigoid, triphenylmethane, anthraquinone, and xanthine dyes. Inorganic pigments include iron oxides, ultramarine and chromium or chromium hydroxide colors, and mixtures thereof.

Suspending Agents

The compositions of the present invention may further comprise a suspending agent at concentrations effective for suspending water-insoluble material in dispersed form in the compositions or for modifying the viscosity of the composition. Such concentrations generally

range from about 0.1% to about 10%, preferably from about 0.3% to about 5.0%, by weight of the composition, of suspending agent.

Suspending agents useful herein include anionic polymers and nonionic polymers. Useful herein are vinyl polymers such as cross linked acrylic acid polymers with the CTFA name Carbomer.

Paraffinic Hydrocarbons

The compositions of the present invention may contain one or more paraffinic hydrocarbons. Paraffinic hydrocarbons suitable for use in compositions of the present invention include those materials which are known for use in hair care or other personal care compositions, such as those having a vapor pressure at 1 atm of equal to or greater than about 21 °C (about 70°F). Non-limiting examples include pentane and isopentane.

Propellants

The composition of the present invention also may contain one or more propellants. Propellants suitable for use in compositions of the present invention include those materials which are known for use in hair care or other personal care compositions, such as liquefied gas propellants and compressed gas propellants. Suitable propellants have a vapor pressure at 1 atm of less than about 21 °C (about 70°F). Non-limiting examples of suitable propellants are alkanes, isoalkanes, haloalkanes, dimethyl ether, nitrogen, nitrous oxide, carbon dioxide, and mixtures thereof.

Other Optional Components

The compositions of the present invention may contain fragrance.

The compositions of the present invention may also contain water-soluble and water-insoluble vitamins such as vitamins B1, B2, B6, B12, C, pantothenic acid, pantothenyl ethyl ether, panthenol, biotin and their derivatives, and vitamins A, D, E, and their derivatives. The compositions of the present invention may also contain water-soluble and water-insoluble amino acids such as asparagine, alanine, indole, glutamic acid and their salts, and tyrosine, tryptamine, lysine, histadine and their salts.

The compositions of the present invention may contain a mono- or divalent salt such as sodium chloride.

The compositions of the present invention may also contain chelating agents.

The compositions of present invention may further comprise materials useful for hair loss prevention and hair growth stimulants or agents.

Method of Making Personal Care Composition

The compositions of the present invention, in general, may be made by mixing the ingredients together at either room temperature or at elevated temperature, *e.g.*, about 72°C. Heat only needs to be used if solid ingredients are in the composition. The ingredients are
5 mixed at the batch processing temperature. Additional ingredients, including electrolytes, polymers, fragrance, and particles, may be added to the product at room temperature.

Method of Treating Hair or Skin

The personal care compositions of the present invention are used in a conventional
10 manner for cleansing and conditioning hair or skin. Generally, a method of treating hair or skin of the present invention comprises applying the personal care composition of the present invention to the hair or skin. More specifically, an effective amount of the personal care composition is applied to the hair or skin, which has preferably been wetted with water, and then the personal care composition is rinsed off. Such effective amounts generally range from
15 about 1 g to about 50 g, preferably from about 1 g to about 20 g. Application to the hair typically includes working the composition through the hair such that most or all of the hair is contacted with the composition.

This method for treating the hair or skin comprises the steps of: (a) applying an effective amount of the personal care composition to the hair or skin, and (b) rinsing the
20 applied areas of hair or skin with water. These steps can be repeated as many times as desired to achieve the desired cleansing and conditioning benefit.

For use in methods of the present invention, the personal care composition may be in various forms, for example, shampoos, body washes, gels, lotions, creams, mousses, and sprays. For some of these forms, the personal care composition may be packaged in a pump-
25 dispenser bottle or in an aerosol container. In other useful forms, the personal care composition may be dried to a film or a powder, or it may be applied to a substrate which is then used for application to the hair or skin.

NON-LIMITING EXAMPLES

30

The compositions illustrated in the following Examples illustrate specific embodiments of the compositions of the present invention, but are not intended to be limiting thereof. Other modifications can be undertaken by the skilled artisan without departing from the spirit and

scope of this invention. These exemplified embodiments of the composition of the present invention provide enhanced deposition of conditioning agents to the hair and/or skin.

The compositions illustrated in the following Examples are prepared by conventional formulation and mixing methods, an example of which is described above. All exemplified amounts are listed as weight percents and exclude minor materials such as diluents, preservatives, color solutions, imagery ingredients, botanicals, and so forth, unless otherwise specified.

The following are representative of shampoo compositions of the present invention:

10

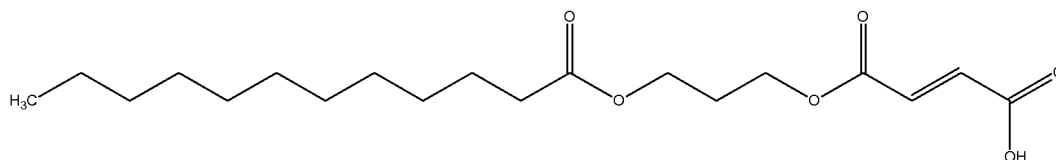
Non-Limiting Examples

Homopolymers

EXAMPLE COMPOSITION	1	2	3	4	5	6	7	8	9	10
Emollient ⁽¹⁸⁾	10	8	0.5	5	5	0.5	1	6	5	7
Ammonium Laureth Sulfate (AE ₃ S)							7.5			
Ammonium Lauryl Sulfate (ALS)						6.5	6.5			
Sodium Laureth Sulfate (SE ₃ S)			6.50							
Sodium Lauryl Sulfate (SLS)			5.50							
Sodium Lauroamphoacetate ⁽¹⁴⁾					2.00					
Cocaminopropionic Acid ⁽¹⁵⁾				1.00						
Cocamidopropyl Betaine ⁽¹⁶⁾				1.00						
Cocamide MEA	1.00	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Cetyl Alcohol	0.35	0.90	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Lauryl Alcohol	0.20		0.35	0.35	0.35			0.35	0.35	0.35
Dihydrogenated Tallowamidoethyl Hydroxyethylmonium Methosulfate ⁽¹⁷⁾			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
1-Propanaminium, N,N,N-trimethyl-3-[(2-methyl-1-oxo-2-propenyl)amino]-, chloride; (Poly(Methacrylamidopropyl trimethyl ammonium chloride)) ^(1,2)	0.40 ⁽¹⁾	0.50 ⁽¹⁾	0.40 ⁽¹⁾	0.40 ⁽¹⁾	0.40 ⁽²⁾					
Methacryloamidopropyl-pentamethyl-1,3-propylene-2-ol-ammonium dichloride ⁽³⁾						0.40				
1-Propanaminium, N,N,N-trimethyl-3-[(1-oxo-2-propenyl)amino]-, chloride; (Poly(Acrylamidopropyl trimethyl ammonium chloride)) ⁽⁴⁾								0.40		
[3-methacryloylamino)propyl] dimethylethylammonium ethylsulfate homopolymer ⁽⁵⁾									0.40	
[(2-methacryloyloxy)ethyl]trimethylammonium methylsulfate homopolymer ⁽⁶⁾										0.40
Ethylene Glycol Distearate		1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Trihydroxystearin ⁽⁷⁾	0.25									
Polyethylene Glycol (14000) ⁽⁸⁾			0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Fragrance	0.55	0.70	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Sodium Chloride	0.30	1.30	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

Ammonium Xylenesulfonate	1.00									
Citric Acid	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sodium Citrate	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sodium Benzoate	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Ethylene Diamine Tetra Acetic Acid	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Dimethicone ^(9, 10, 11)		2.35 ⁽⁹⁾	0.50 ⁽⁹⁾	2.00 ⁽¹⁰⁾	2.00 ⁽¹¹⁾	0.80 ⁽⁹⁾	0.80 ⁽⁹⁾	0.50 ⁽⁹⁾	0.50 ⁽⁹⁾	
Polydecene ⁽¹²⁾		0.40								
Trimethylolpropane Tricaprylate/Tricaprate ⁽¹³⁾		0.10								
Water and Minors (QS to 100%)										

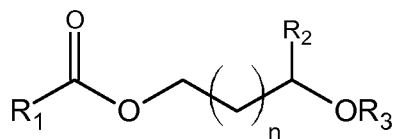
- 5 (1) HMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight ~ 860,000]
 (2) HHMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight ~ 1,500,000]
 (3) Diquat (Rhodia) [charge density = 5.60 meq/g, molecular weight ~ 252,000]
 (4) APTAC (Rhodia) [charge density = 4.88 meq/g, molecular weight ~ 1,916,000]
 (5) Homopolymer of DMAPMA + DES (Rhodia) [charge density = 3.09 meq/g, molecular weight ~ 180,000]
 (6) Homopolymer of METAMS (Rhodia) [charge density = 3.53 meq/g, molecular weight ~ 313,000]
 10 (7) Thixcin R (Rheox)
 (8) PEG 14M (Dow Chemical)
 (9) Viscasil 330M (General Electric Silicones)
 (10) Dow Corning ® 1664 Emulsion (Dow Corning)
 (11) Dow Corning ® 2-1865 Microemulsion (Dow Corning)
 15 (12) Puresyn 6, MCP-1812 (Mobil)
 (13) Mobil P43 (Mobil)
 (14) Miranol Ultra L32 (Rhodia)
 (15) MACKAM 151C (McIntyre)
 (16) Tegobetaine F-B (Goldschmidt)
 (17) Varisoft 110 (Witco)
 20 (18) An emollient component according to the formula:



What is claimed is:

1. A personal care composition comprising an emollient represented by the formula:

5



10

wherein:

R_1 is $\text{CH}_3(\text{CH}_2)_m$ and may be interrupted with at least one heteroatom selected from the group consisting of amine, ether, ester, amide, sulfur, sulfur monoxide, sulfur dioxide, sulfamate, hydroxy, or mixtures thereof; and

$m = 6-16$

15

$n = 0$ or 1

$\text{R}_2 = \text{H}$ or CH_3 ; and

$\text{R}_3 = \text{CO}(\text{CH}_2)_2\text{COOH}$ or $\text{CO}(\text{CH}_2)_2\text{COOH}$.

20

2. A personal care composition according to claim 1, further comprising one or more surfactants.

3. A personal care composition according to claim 1, wherein said emollient is derived from a natural feedstock.

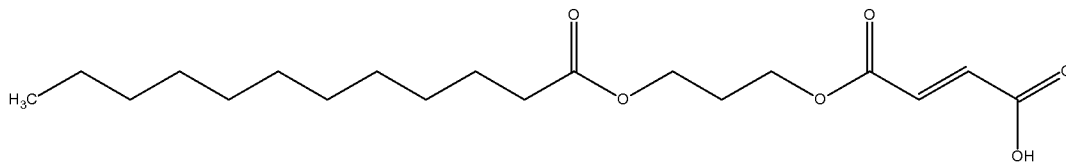
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4. A personal care composition according to claim 3, wherein said natural feedstock is a monoester of vegetable oil fatty acids and 1,3-propanediol.

30

5. A personal care composition according to claim 4, wherein said vegetable oil fatty acid is selected from the group consisting of coconut, palm, soybean, rapeseed, sunflower seed, peanut, cottonseed, palm kernel, and olive.

6. A personal care composition according to claim 1, wherein said emollient has the formula:



7. A surfactant according to claim 1, wherein said personal care composition comprises one or more ingredients selected from the group consisting of a conditioning agent, natural cationic deposition polymers, synthetic cationic deposition polymers, anti-dandruff agents, particles, suspending agents, paraffinic hydrocarbons, propellants, viscosity modifiers, dyes, non-volatile solvents or diluents (water-soluble and water-insoluble), pearlescent aids, foam boosters, additional surfactants or nonionic cosurfactants, pediculicides, pH adjusting agents, perfumes, preservatives, chelants, proteins, skin active agents, sunscreens, UV absorbers, and vitamins, wherein said ingredients are provided in a cosmetically acceptable medium.
8. A surfactant according to claim 1, wherein said personal care composition consists essentially of ingredients which are natural or naturally derived.