(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 May 2013 (30.05.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/076148 A2

(51) **International Patent Classification**: Not classified

(21) **International Application Number**:
PCT/EP2012/073250

(22) **International Filing Date**:
21 November 2012 (21.11.2012)

(25) **Filing Language**: English

(26) **Publication Language**: English

(30) **Priority Data**:
61/562,481 22 November 2011 (22.11.2011) US

(71) **Applicant** *(for AE, AG, AU, BB, BH, BN, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, KE, KN, LC, LK, LS, MT, MW, MY, NA, NG, NZ, OM, PG, QA, RW, SC, SD, SG, SL, SZ, TT, TZ, UG, VC, ZA, ZM, ZW only)*: **UNILEVER PLC** [GB/GB]; Unilever House, 100 Victoria Embankment, London EC4Y 0DY (GB).

(71) **Applicant** *(for all designated States except AE, AG, AU, BB, BH, BN, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, IN, KE, KN, LC, LK, LS, MT, MW, MY, NA, NG, NZ, OM, PG, QA, RW, SC, SD, SG, SL, SZ, TT, TZ, UG, US, VC, ZA, ZM, ZW)*: **UNILEVER N.V.** [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).

(71) **Applicant** *(for IN only)*: **HINDUSTAN UNILEVER LIMITED** [IN/IN]; Unilever House, B.D. Sawant Marg Chakala Andheri (East), Mumbai, Maharashtra 400 099 (IN).

(71) **Applicant** *(for US only)*: **CONOPCO, INC., D/B/A UNILEVER** [US/US]; 800 Sylvan Avenue, AG West, S. Wing, Englewood Cliffs, New Jersey 07632 (US).

(72) **Inventor**: **HARICHIAN, Bijan**; Conopco Inc. d/b/a UNILEVER, 40 Merritt Boulevard, Trumbull, Connecticut 06611 (US).

(74) **Agent**: **CORSTEN, Michael, Allan**; Unilever PLC, Unilever Patent Group, Colworth House, Sharnbrook, Bedford Bedfordshire MK44 1LQ (GB).

(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(54) **Title**: PERSONAL CARE COMPOSITIONS WITH ENHANCED FRAGRANCE DELIVERY VIA POLYHYDROXY QUATERNARY AMMONIUM SALTS

(57) **Abstract**: A personal care product is provided which includes a fragrance, a polyhydroxy quaternary ammonium salt and a cosmetically acceptable carrier. The polyhydroxy quaternary ammonium salt operates as a scent boosting system to enhance volatilization of fragrance components upon the personal care composition being first applied to human skin or hair.

WO 2013/076148 A2

PERSONAL CARE COMPOSITIONS WITH ENHANCED FRAGRANCE DELIVERY VIA POLYHYDROXY QUATERNARY AMMONIUM SALTS

Field of the Invention

The invention concerns personal care compositions which upon application to a human body surface quickly release fragrance components thereby improving aesthetics of these compositions.

The Related Art

Perhaps the most significant aesthetic of a personal care product for a consumer is fragrance. It is also important to rapidly deliver the scent.

Many techniques have been reported to manipulate timing and impact of fragrance. Delayed generation has been achieved through encapsulation of scent ingredients. For instance, U.S. Patent 5,135,747 (Faryniarz et al.) reports an unscented malodor counteractant deo perfume mixture encapsulated within a semi-permeable wall material and a quicker releasable non-encapsulated fragrance perfume mixture in a cosmetically acceptable vehicle. Slow release has also been achieved through pro-accords. These chemicals slowly break down releasing an odoriferous component as a degradation fragment. Menthol is the most frequent commercially delivered degradation constituent of pro-accords contained in personal care compositions. Illustrative of this technology is U.S. Patent 6,100,233 (Sivik et al.) employing a β-ketoester pro-accord which transforms to chemically release fragranced alcohols such as linalool, dihydromyrcenol and other alcohols.

Steady release technologies have also been reported. Most prominent are a series of disclosures on enduring perfumes. See U.S. Patent 5,833,999; U.S. Patent 5,849,310 and U.S. Patent 6,086,903 all to Trinh et al. describing personal treatment compositions delivering an enduring perfume that provides a lasting olfactory sensation.

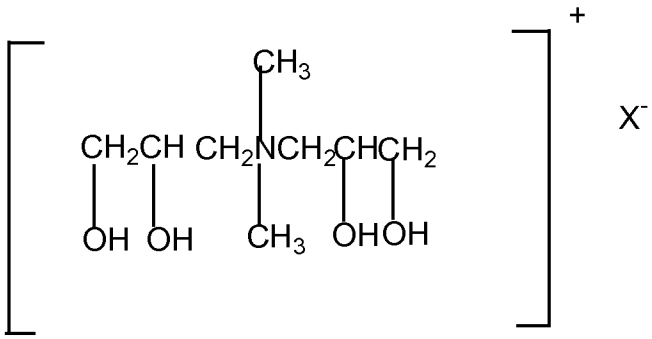
Although technologies are known for delayed release and prolonged perfume generation, none has fully solved the problem of rapidly releasing (or boosting the effect of) a fragrance onto human skin or hair.

Summary of the invention

A personal care composition is provided which includes:

(i) from 0.0001 to 5% of a fragrance to impart a pleasant scent onto a human body to which the composition is applied;

(ii) from 0.01 to 20% by weight of a scent boosting agent which is a polyhydroxy quaternary ammonium salt of structure (I):



(I)

wherein X^- is selected from the group consisting of chloride, bromide, hydroxyl, sulphate, phosphate, methosulphate, carboxyl, citrate and tartrate; and

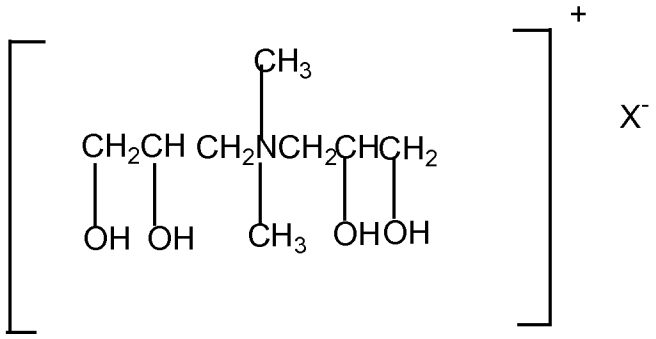
(iii) a cosmetically acceptable carrier.

Detailed description of the invention

Now it has been found that a burst of fragrance from a personal care composition can be quickly released when the composition is deposited upon a human body part. More particularly, we have found that polyhydroxy quaternary ammonium salts function as scent boosting agent. These agents allow rapid volatilization of fragrance components during application of the personal care composition to skin or hair.

By the term personal care composition is meant any product applied to a human body for improving appearance, cleansing, odor control or general aesthetics. Nonlimiting examples of personal care compositions include leave-on skin lotions and creams, shampoos, conditioners, shower gels, toilet bars, antiperspirants, deodorants, shave creams, depilatories, lipsticks, foundations, mascara, sunless tanners and sunscreen lotions.

An important element of the present invention is a scent boosting agent. This is a polyhydroxy quaternary ammonium salt having general structure (I):



(I)

wherein X^- is selected from the group consisting of chloride, bromide, hydroxyl, sulphate, phosphate, methosulphate, carboxyl, citrate and tartrate.

Amounts of the polyhydroxy quaternary ammonium salts may range from 0.01 to 20%, and preferably, from 0.1 to 15%, and more preferably, from 0.5 to 10%, optimally from 1 to 8% by weight of the composition. Most preferred as the polyhydroxy quaternary ammonium salt is bis(dihydroxypropyl)dimethylammonium chloride.

The term “fragrance” is defined as a mixture of odoriferous components, optionally mixed with a suitable solvent diluent or carrier, which is employed to impart a desired odor.

Fragrance components and mixtures thereof may be obtained from natural products such as essential oils, absolutes, resinoids, resins and concretes, as well as synthetic products such as hydrocarbons, alcohols, aldehydes, ketones, ethers, carboxylic acids, esters, acetals, ketals, nitriles and the like, including saturated and unsaturated compounds, aliphatic, carbocyclic and heterocyclic compounds.

Suitable characteristics of fragrances can include at least one of the following, in any combination: (1) liquid or semi-liquid after mixing with the other components; (2) pleasant and/or clean odor when mixed with other components, e.g., one or more of lavender, violet, rose, jasmin, pine, woody, floral, fruity, lemon, lime, apple, peach, raspberry, strawberry, banana, plum, apricot, vanilla, pear, eucalyptus, aromatic, aldehydic, tutti frutti, oriental, sweet, amber, Paola, Muguet, Citron (lime) ella, and the like; (3) specific gravity (20/20) in the range of 0.600-1.300, preferably 0.800-1.100, each preferably varying 0.001-0.05, more preferably 0.008-0.020; (4) refractive index (20°C) of 1.300-1.800, preferably 1.400-1.600, each preferably varying 0.001-0.05, more preferably 0.008-0.020; (5) saponification value of

5-300, preferably 10-250; and (6) having a flash point of 20-200 Pensky-Martens Closed Cup (P.M.C.C.) and 10-100 Tag-Closed Cup (T.C.C.).

Typical fragrance components which may be employed for the present invention can be selected from one or more of:

2-methoxy naphthalene
Allyl cyclohexane propionate
alpha-citronellal
alpha-ionone
alpha-Santalol
alpha-Terpineol
Ambrettolide
Amyl benzoate
Amyl cinnamate
Amyl cinnamic aldehyde
Aurantiol
Benzaldehyde
Benzophenone
Benzyl acetate
Benzyl salicylate
Beta-caryophyllene
beta-Methyl naphthyl ketone
Cadinene
Cavacrol
Cedrol
Cedryl acetate
Cedryl formate
Cinnamyl cinnamate
cis-Jasmone
Coumarin
Cyclamen aldehyde
Cyclohexyl salicylate
d-Limonene
delta-Nonalactone
delta-Undecalactone
Dihydro isojasmonate
Dimethyl acetal
Diphenyl methane
Diphenyl oxide
Dodecalactone
Ethyl methyl phenyl glycidate
Ethyl undecylenate
Ethylene brassylate
Eugenol
Exaltolide
Galaxolide
gamma-n-methyl ionone
gamma-Undecalactone
Geranial

Geranyl acetate
Geranyl anthranilate
Geranyl phenyl acetate
Hexadecanolide
Hexenyl salicylate
Hexyl cinnamic aldehyde
Hexyl salicylate
Hydroxycitronellal
Indole
Iso E super
Iso-Amyl salicylate
Iso-bornyl acetate
Iso-butyl quinoline
Iso-Eugenol
Laevo-Carvone
Lilial (p-t-bucinal)
Linalool
Linalyl acetate
Linalyl benzoate
Methyl cinnamate
Methyl dihydrojasmonate
Methyl-N-methyl anthranilate
Musk indanone
Musk ketone
Musk tibetine
Myristicin
Nerol
Oxahexadecanolide-10
Oxahexadecanolide-11
para-cymene
para-tert-Butyl cyclohexyl acetate
Patchouli alcohol
Phantolide
Phenyl ethyl alcohol
Phenyl ethyl benzoate
Phenyl heptanol
Phenylhexanol
Phexylethylphenylacetate
Thibetolide
Vanillin
Vertenex
Vetiveryl acetate
Yara-yara
Ylangene

Still additional fragrance components (used either alone or in combination) suitable for use in this invention include those often characterized as low volatile fragrances. Such fragrances include but are not limited to:

Camphor
5-methyl, 2-1-cyclohexanone
Allyl heptanoate
Allyl-terpineol
Gardenol
Citronellol
Phenylethyl acetate
Citral
Alpha-terpinolene
2-tertiobytycyclo hexyl
Tertbutyl cyclohexyl acetate
Beta-ionone
4-tert-butylcyclohexyl acetate
Alpha-terpinene
2,6-dimethyl ocatadiene
Damascone
Benzene, 1,1, oxybis
Beta methylionone
Octalactone
Ethyl ester decadienoic
Methyl ionone
Rose phenone
Dihydro methyl jasmonate
Ambrox
Benzyl benzoate
Isoamyl acetate
Ethyl methyl valerate
2-octanone
Hexyl acetate
Iso-amyl acetate
Limonene
Butyl isovalerate
Dihydromyrcenol
Tripal
Terpinolene
Tripal 2
Cyclohexano, 2,1,1 methyl ethyl
Orange crystals
Peach lactone
Citronellyl acetate
Alpha terpinyl acetate

Suitable solvents, diluents or carriers for perfumes as mentioned above are for example: ethanol, isopropanol, diethylene glycol monoethyl ether, dipropyl glycol, triethyl citrate and the like.

Particularly preferred fragrance components of the present invention are cyclic and acyclic terpenes and terpenoids. These materials are based upon isoprene repeating units. Examples include alpha and beta pinene, myrcene, geranyl alcohol and acetate, camphene,

dl-limonene, alpha and beta phellandrene, tricyclene, terpinolene, allocimmane, geraniol, nerol, linanool, dihydrolinanool, citral, ionone, methyl ionone, citronellol, citronellal, alpha terpineol, beta terpineol, alpha fenchol, borneol, isoborneol, camphor, terpinen-1-ol, terpin-4-ol, dihydroterpineol, methyl chavicol, anethole, 1,4 and 1,8 cineole, geranyl nitrile, isobornyl acetate, linalyl acetate, caryophyllene, alpha cedrene, guaiol, patchouli alcohol, alpha and beta santalol and mixtures thereof.

Amounts of the fragrance may range from 0.0001 to 5%, usually from 0.001 to 2.5%, more usually from 0.1 to 1.5% by weight of the composition.

Compositions of this invention may also include a cosmetically acceptable carrier. Amounts of the carrier may range from 1 to 99.9%, preferably from 70 to 95%, optimally from 80 to 90% by weight of the composition. Among the useful carriers are water, emollients, fatty acids, fatty alcohols, humectants, thickeners and combinations thereof. The carrier may be aqueous, anhydrous or an emulsion. Preferably the compositions are aqueous, especially water and oil emulsions of the W/O or O/W or triplex W/O/W variety. Water when present may be in amounts ranging from 5 to 95%, preferably from 20 to 70%, optimally from 35 to 60% by weight.

Emollient materials may serve as cosmetically acceptable carriers. These may be in the form of silicone oils, synthetic esters and hydrocarbons. Amounts of the emollients may range anywhere from 0.1 to 95%, preferably between 1 and 50% by weight of the composition.

Silicone oils may be divided into the volatile and nonvolatile variety. The term “volatile” as used herein refers to those materials which have a measurable vapor pressure at ambient temperature. Volatile silicone oils are preferably chosen from cyclic (cyclomethicone) or linear polydimethylsiloxanes containing from 3 to 9, preferably from 4 to 5, silicon atoms.

Nonvolatile silicone oils useful as an emollient material include polyalkyl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers. The essentially nonvolatile polyalkyl siloxanes useful herein include, for example, polydimethyl siloxanes with viscosities of from 5×10^{-6} to 0.1 m^2/s at 25°C. Among the preferred nonvolatile emollients useful in the present compositions are the polydimethyl siloxanes having viscosities from 1×10^{-5} to 4×10^{-4} m^2/s at 25°C.

Another class of nonvolatile silicones are emulsifying and non-emulsifying silicone elastomers. Representative of this category is Dimethicone/Vinyl Dimethicone Crosspolymer available as Dow Corning 9040, General Electric SFE 839, and Shin-Etsu KSG-18. Silicone waxes such as Silwax WS-L (Dimethicone Copolyol Laurate) may also be useful.

Among the ester emollients are:

1) Alkyl esters of saturated fatty acids having 10 to 24 carbon atoms. Examples thereof include behenyl neopentanoate, isononyl isonanonoate, isopropyl myristate and octyl stearate.

2) Ether-esters such as fatty acid esters of ethoxylated saturated fatty alcohols.

3) Polyhydric alcohol esters. Ethylene glycol mono and di-fatty acid esters, diethylene glycol mono- and di-fatty acid esters, polyethylene glycol (200-6000) mono- and di-fatty acid esters, propylene glycol mono- and di-fatty acid esters, polypropylene glycol 2000 monostearate, ethoxylated propylene glycol monostearate, glyceryl mono- and di-fatty acid esters, polyglycerol poly-fatty esters, ethoxylated glyceryl mono-stearate, 1,3-butylene glycol monostearate, 1,3-butylene glycol distearate, polyoxyethylene polyol fatty acid ester, sorbitan fatty acid esters, and polyoxyethylene sorbitan fatty acid esters are satisfactory polyhydric alcohol esters. Particularly useful are pentaerythritol, trimethylolpropane and neopentyl glycol esters of C_1-C_{30} alcohols.

4) Wax esters such as beeswax, spermaceti wax and tribehenin wax.

5) Sugar ester of fatty acids such as sucrose polybehenate and sucrose polycottonseedate.

Hydrocarbons which are suitable cosmetically acceptable carriers include petrolatum, mineral oil, C_{11}-C_{13} isoparaffins, and especially isohexadecane, available commercially as Permethyl 101A from Presperse Inc.

Fatty acids having from 10 to 30 carbon atoms may also be suitable as cosmetically acceptable carriers. Illustrative of this category are pelargonic, lauric, myristic, palmitic, stearic, isostearic, oleic, hydroxystearic and behenic acids.

Fatty alcohols having from 10 to 30 carbon atoms are another useful category of cosmetically acceptable carrier. Illustrative of this category are stearyl alcohol, lauryl alcohol, myristyl alcohol and cetyl alcohol.

Humectants of the polyhydric alcohol-type can be employed as cosmetically acceptable carriers. Typical polyhydric alcohols include glycerol, polyalkylene glycols and more preferably alkylene polyols and their derivatives, including propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol and derivatives thereof, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,3-butylene glycol, isoprene glycol, 1,2,6-hexanetriol, ethoxylated glycerol, propoxylated glycerol and mixtures thereof. The amount of humectant may range anywhere from 0.5 to 50%, preferably between 1 and 15% by weight of the composition.

Thickeners can be utilized as part of the cosmetically acceptable carrier of compositions according to the present invention. Typical thickeners include crosslinked acrylates (e.g. Carbopol 982®), hydrophobically-modified acrylates (e.g. Carbopol 1382®), cellulosic derivatives and natural gums. Among useful cellulosic derivatives are sodium carboxymethylcellulose, hydroxypropyl methocellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, ethyl cellulose and hydroxymethyl cellulose. Natural gums suitable for the present invention include guar, xanthan, sclerotium, carrageenan, pectin and combinations of these gums. Inorganics may also be utilized as thickeners, particularly clays such as bentonites and hectorites, fumed silicas, and silicates such as magnesium aluminum silicate (Veegum®). Amounts of the thickener may range from 0.0001 to 10%, usually from 0.001 to 1%, optimally from 0.01 to 0.5% by weight of the composition.

Personal care compositions of the present invention may be in any form. These forms may include lotions, creams, roll-on formulations, sticks, mousses, aerosol and non-aerosol sprays and fabric (e.g. nonwoven textile)-applied formulations.

Surfactants may also be present in compositions of the present invention. Total concentration of the surfactant when present may range from 0.1 to 40%, preferably from 1 to 20%, optimally from 1 to 5% by weight of the composition. The surfactant may be selected from the group consisting of anionic, nonionic, cationic and amphoteric actives. Particularly preferred nonionic surfactants are those with a C_{10}-C_{20} fatty alcohol or acid hydrophobe condensed with from 2 to 100 moles of ethylene oxide or propylene oxide per mole of hydrophobe; C_2-C_{10} alkyl phenols condensed with from 2 to 20 moles of alkylene oxide; mono- and di-fatty acid

esters of ethylene glycol; fatty acid monoglyceride; sorbitan, mono- and di- C_8-C_{20} fatty acids; and polyoxyethylene sorbitan as well as combinations thereof. Alkyl polyglycosides and saccharide fatty amides (e.g. methyl gluconamides) are also suitable nonionic surfactants.

Preferred anionic surfactants include soap, alkyl ether sulfates and sulfonates, alkyl sulfates and sulfonates, alkylbenzene sulfonates, alkyl and dialkyl sulfosuccinates, C_8-C_{20} acyl isethionate, C_8-C_{20} alkyl ether phosphates, C_8-C_{20} sarcosinates and combinations thereof.

Sunscreen actives may also be included in compositions of the present invention. Particularly preferred are such materials as ethylhexyl p-methoxycinnamate (available as Parsol MCX®), Avobenzene (available as Parsol 1789®), octylsalicylate (available as Dermablock OS®), tetraphthalylidene dicamphor sulfonic acid (available as Mexoryl SX®), benzophenone-4 and benzophenone-3 (Oxybenzone). Inorganic sunscreen actives may be employed such as microfine titanium dioxide, zinc oxide, polyethylene and various other polymers. By the term "microfine" is meant particles of average size ranging from 10 to 200 nm, preferably from 20 to 100 nm. Amounts of the sunscreen agents when present may generally range from 0.1 to 30%, preferably from 2 to 20%, optimally from 4 to 10% by weight of the composition.

Preservatives can desirably be incorporated into the cosmetic compositions of this invention to protect against the growth of potentially harmful microorganisms. Suitable traditional preservatives for compositions of this invention are alkyl esters of para-hydroxybenzoic acid. Other preservatives which have more recently come into use include hydantoin derivatives, propionate salts, and a variety of quaternary ammonium compounds. Cosmetic chemists are familiar with appropriate preservatives and routinely choose them to satisfy the preservative challenge test and to provide product stability. Particularly preferred preservatives are phenoxyethanol, methyl paraben, propyl paraben, imidazolidinyl urea, sodium dehydroacetate and benzyl alcohol. The preservatives should be selected having regard for the use of the composition and possible incompatibilities between the preservatives and other ingredients in the emulsion. Preservatives are preferably employed in amounts ranging from 0.01% to 2% by weight of the composition.

Compositions of the present invention may include vitamins. Illustrative vitamins are Vitamin A (retinol), Vitamin B_2, Vitamin B_3 (niacinamide), Vitamin B_6, Vitamin C, Vitamin E and Biotin. Derivatives of the vitamins may also be employed. For instance, Vitamin C derivatives include ascorbyl tetraisopalmitate, magnesium ascorbyl phosphate and ascorbyl glycoside. Derivatives of Vitamin E include tocopheryl acetate, tocopheryl palmitate and tocopheryl

linoleate. DL-panthenol and derivatives may also be employed. A particularly suitable Vitamin B_6 derivative is Pyridoxine Palmitate. Flavanoids may also be useful, particularly glucosyl hesperidin, rutin, and soy isoflavones (including genistein, daidzein, equol, and their glucosyl derivatives) and mixtures thereof. Total amount of vitamins or flavonoids when present may range from 0.0001 to 10%, preferably from 0.01% to 1%, optimally from 0.1 to 0.5% by weight of the composition.

Another type of useful substance can be that of an enzyme such as oxidases, proteases, lipases and combinations. Particularly preferred is superoxide dismutase, commercially available as Biocell SOD from the Brooks Company, USA.

Skin lightening compounds may be included in the compositions of the invention. Illustrative substances are placental extract, lactic acid, niacinamide, arbutin, kojic acid, ferulic acid, resorcinol and derivatives including 4-substituted resorcinols and combinations thereof. Amounts of these agents may range from 0.1 to 10%, preferably from 0.5 to 2% by weight of the composition.

Desquamation promoters may be present. Illustrative are the alpha-hydroxycarboxylic acids and beta-hydroxycarboxylic acids. The term “acid” is meant to include not only the free acid but also salts and C_1-C_{30} alkyl or aryl esters thereof and lactones generated from removal of water to form cyclic or linear lactone structures. Representative acids are glycolic, lactic and malic acids. Salicylic acid is representative of the beta-hydroxycarboxylic acids. Amounts of these materials when present may range from 0.01 to 15% by weight of the composition.

A variety of herbal extracts may optionally be included in compositions of this invention. Illustrative are pomegranate, white birch (Betula Alba), green tea, chamomile, licorice and extract combinations thereof. The extracts may either be water soluble or water-insoluble carried in a solvent which respectively is hydrophilic or hydrophobic. Water and ethanol are the preferred extract solvents.

Also included may be such materials as lipoic acid, kinetin, retinoxytrimethylsilane (available from Clariant Corp. under the Silcare 1M-75 trademark), dehydroepiandrosterone (DHEA) and combinations thereof. Ceramides (including Ceramide 1, Ceramide 3, Ceramide 3B, Ceramide 6 and Ceramide 7) as well as pseudoceramides may also be utilized for many compositions of the present invention but may also be excluded. Amounts of these materials may range from 0.000001 to 10%, preferably from 0.0001 to 1% by weight of the composition.

Colorants, opacifiers and abrasives may also be included in compositions of the present invention. Each of these substances may range from 0.05 to 5%, preferably between 0.1 and 3% by weight of the composition.

The compositions of the present invention can also be, optionally, incorporated into a water insoluble substrate for application to the skin such as in the form of a treated wipe.

The term "comprising" is meant not to be limiting to any subsequently stated elements but rather to encompass non-specified elements of major or minor functional importance. In other words the listed steps, elements or options need not be exhaustive. Whenever the words "including" or "having" are used, these terms are meant to be equivalent to "comprising" as defined above.

Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material ought to be understood as modified by the word "about".

All documents referred to herein, including all patents, patent applications, and printed publications, are hereby incorporated by reference in their entirety in this disclosure.

The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

Examples

EXAMPLE 1

A representative personal care composition of the present invention in the form of a cosmetic lotion is outlined under Table I.

TABLE I

INGREDIENT	WEIGHT %
PHASE A	
Water	Balance
Disodium EDTA	0.05
Methyl Paraben	0.15
Magnesium Aluminum Silicate	0.60

Triethanolamine	1.20
Bis(dihydroxypropyl)dimethylammonium chloride	1.00
PHASE B	
Xanthan Gum	0.20
Natrosol® 250HHR (ethyl cellulose)	0.50
Butylene Glycol	3.00
Glycerin	2.00
PHASE C	
Sodium Stearoyl Lactylate	0.10
Glycerol Monostearate	1.50
Stearyl Alcohol	1.50
Isostearyl Palmitate	3.00
Silicone Fluid	1.00
Cholesterol	0.25
Sorbitan Stearate	1.00
Butylated Hydroxy Toluene	0.05
Vitamin E Acetate	0.01
PEG-100 Stearate	2.00
Stearic Acid	3.00
Propyl Paraben	0.10
Parsol MCX®	2.00
Caprylic/Capric Triglyceride	0.50
Hydroxycaprylic Acid	0.01
C12-15 Alkyl Octanoate	3.00
PHASE D	
Vitamin A Palmitate	0.10
Bisabolol	0.01
Vitamin A Acetate	0.01
Fragrance	1.00
Retinol 50C	0.02
Conjugated Linoleic Acid	0.50

EXAMPLE 2

A water-in-oil topical liquid make-up foundation according to invention is described in Table II below.

TABLE II

INGREDIENT	WEIGHT %
PHASE A	
Cyclomethicone	9.25
Oleyl Oleate	2.00
Dimethicone Copolyol	20.00
PHASE B	
Talc	3.38
Pigment (Iron Oxides)	10.51

Spheron L-1500 (Silica)	0.50
PHASE C	
Synthetic Wax Durachem 0602	0.10
Arachidyl Behenate	0.30
PHASE D	
Cyclomethicone	1.00
Trihydroxystearin	0.30
PHASE E	
Laureth-7	0.50
Propyl Paraben	0.25
PHASE F	
Fragrance	0.5
PHASE G	
Water	balance
Bis(dihydroxypropyl)dimethylammonium chloride	0.50
Methyl Paraben	0.12
Propylene Glycol	8.00
Niacinamide	4.00
Glycerin	3.00
Sodium Chloride	2.00
Sodium Dehydroacetate	0.30

EXAMPLE 3

A disposable, single use personal care towelette product is described according to the present invention. A 70/30 polyester/rayon non-woven towelette is prepared with a weight of 1.8 grams and dimensions of 15 cm by 20 cm. Onto this towelette is impregnated a composition with a terpenoid type fragrance, and bis(dihydroxypropyl)dimethylammonium chloride as outlined in Table III below.

TABLE III

INGREDIENT	WEIGHT %
Bis(dihydroxypropyl)dimethylammonium chloride	4.00
Glycerin	2.00
Hexylene Glycol	2.00
Disodium Capryl Amphodiacetate	1.00
Gluconolactone	0.90
Silicone Microemulsion	0.85
Witch Hazel	0.50
PEG-40 Hydrogenated Castor Oil	0.50
Fragrance (Terpenoid Mixture)	0.20
Vitamin E Acetate	0.001
Water	Balance

EXAMPLE 4

A toilet bar illustrative of the present invention is outlined under Table IV.

TABLE IV

INGREDIENT	WEIGHT %
Sodium Soap (85/15 Tallow/Coconut)	77.77
Bis(dihydroxypropyl)dimethylammonium chloride	3.50
Hydroxyethyl Urea	1.00
Dimethicone	2.00
Sodium Chloride	0.77
Titanium Dioxide	0.40
Fragrance	1.50
Disodium EDTA	0.02
Sodium Etidronate	0.02
Fluorescer	0.024
Water	Balance

EXAMPLE 5

A shampoo composition useful in the context of the present invention is described in Table V below.

TABLE V

Ingredient	Weight %
Ammonium Laureth Sulfate	12.00
Ammonium Lauryl Sulfate	2.00
Cocoamidopropyl Betaine	2.00
Sodium Lauroamphoacetate	2.00
Glycerin	12.00
Bis(dihydroxypropyl)dimethylammonium chloride	1.75
Hydroxyethyl Urea	1.50
Ethylene Glycol Distearate	1.50
Cocomonoethanolamide	0.80
Cetyl Alcohol	0.60
Polyquaternium-10	0.50
Dimethicone	1.00
Zinc Pyridinethione	1.00
Sodium Citrate	0.40
Citric Acid	0.39
Sodium Xylene Sulfonate	1.00
Fragrance	0.40
Sodium Benzoate	0.25
Kathon CG®	0.0008
Benzyl Alcohol	0.0225
Water	Balance

EXAMPLE 6

This Example illustrates an antiperspirant/deodorant formula according to the present invention.

TABLE VI

Ingredient	Weight %
Cyclopentasiloxane	36
Dimethicone	20
Aluminum Zirconium Trichlorohydrex Glycinate	15
Bis(dihydroxypropyl)dimethylammonium chloride	3.0
C_{18}-C_{36} Acid Triglyceride	5.0
Microcrystalline Wax	3.0
Glycerin	8.0
Silica	2.5
Dimethicone Crosspolymer	1.0
Fragrance	0.5
Disodium EDTA	0.4
Butylated Hydroxytoluene	0.3
Citric Acid	0.3

EXAMPLE 7

This Example illustrates a series of skin lotions formulated for purposes of the present invention.

TABLE VII

	Sample No. (Weight %)				
Ingredients	A	B	C	D	E
PEG-4	-	qs	-	-	-
PEG-8	qs	-	qs	qs	-
Bis(dihydroxypropyl)dimethylammonium chloride	3	5	0.5	2	1.5
Propylene Glycol	-	-	5	-	qs
Dipropylene Glycol	-	-	10	-	-
Pentylene Glycol	-	-	5	-	-
Glycerin	-	-	-	10	-
Water	-	-	-	5	-
Sodium Bicarbonate	34	15	-	20	25
Magnesium Sulfate	-	-	15	-	-
Dryflo Plus[1]	-	-	-	2	-
Microthene FN510-00[2]	-	-	2	-	-
Titanium Dioxide	-	-	-	0.5	-
Cab-O-Sil (Fumed Silica)	-	4	-	-	-
Niacinamide	0.1	-	-	-	0.1
D-Panthenol	-	0.5	-	-	-
Vitamin C	0.001	-	-	-	-

Vitamin E Acetate	0.01	-	-	-	-
Polysorbate 20	4	-	6	-	-
Laureth-4	-	-	-	0.5	-
Methylparaben	-	-	-	0.05	-
FD&C Dyes	0.0011	-	-	-	-
Fragrance	0.15	0.8	1.2	3	5

[1] Aluminum starch octenylsuccinate powder supplied by National Starch, Bridgewater, NJ, USA
[2] Polyethylene powder supplied Equistar Chemicals, Houston, TX, USA

EXAMPLE 8

A series of experiments were conducted to evaluate release and prolonged scent generation of typical components of a perfume mixture. Samples were prepared by mixing 10% of scent boosting agent (Bis(dihydroxypropyl)dimethylammonium chloride) in water along with 0.05% commercially available oils like Deep Moisture perfume oil. This oil is a mixture of many components including but not limited to limonene, dihydromyrcenol, gamma terpinene, benzyl acetate, linalool, pinene, isomethyl ionone and others.

Samples were analyzed by gas chromatography (GC) analysis of headspace gases. In this procedure, the equipment utilized was a solid phase microextraction (SPME) system employing gas chromatography (GC) 6890 / mass spectrometry (MS) 5973 / flame ionization detector (FID). This equipment measured relative perfume compound abundance in the headspace over the fragrance/boosting agent/water mixture, as well as over the fragrance/water mixture. One gram of fragrance/boosting agent/water mixture was prepared in 20 ml GC headspace sampling vials sealed with caps having septums (from Gerstel, Inc.). The GC column was a HP-5MS column from Agilent (inner diameter 0.25 mm, length 30 m, stationary phase thickness 0.25um). The GC conditions were as follows: Injector in splitless mode with helium gas as carrier gas. Injection port was heated to 250°C, purge flow to split vent 50ml/min at zero minutes. Column was in constant flow mode with 1.3 ml/min flow rate. Oven temperature ramp: hold at 75°C for 2 minutes, then increase oven temperature at a rate of 6°C/min to 100°C, 1.5°C/min to 150°C, 3°C/,min to 190°C, 30°C/min to 300°C and hold for 2 minutes. MS conditions were: solvent delay for 0.5 minutes, scan starting from low mass 35 to high mass 300. Autosampler's conditions were: No incubation (all experiments done in room temperature). SPME fibre was inserted into the sample headspace for a 5 minute extraction and then injected to the injector for a 15 minute desorption.

Results of the experiments are reported as relative fragrance component headspace (HS) abundance as normalized to 0.05% of the same commercial available fragrance oil in water (without boosting agent), i.e., the HS of 0.05% of the same commercial available fragrance oil in water is 1.0.

chemical name	CAS	water	with 10% boosting agent
butanoic acid, 2-methyl, ethyl ester	7452-79-1	1	1.03
isoamyl acetate	123-92-2	1	0.94
ethyl methylvalerate	39255-32-8	1	0.97
2-octanone	111-13-7	1	0.88
hexyl acetate	142-92-7	1	0.91
limonene	138-86-3	1	0.54
butyl isovalerate	109-19-3	1	0.89
dihydromyrcenol	53219-21-9	1	1.53
triplal		1	1.20
terpinolene	586-62-9	1	0.95
benzoic acid, methyl ester	93-58-3	1	0.94
linalool	78-70-6	1	1.41
triplal 2		1	0.61
phenylethyl alcohol	60-12-8	1	0.83
camphor	76-22-2	1	1.15
cyclohexanone, 5methyl-2-1-methylethyl trans	14073-97-3	1	1.25
benzyl acetate	140-11-4	1	0.58
allyl heptanoate	142-19-8	1	0.94
alpha terpineol	98-55-5	1	1.30
gardenol	93-92-5	1	1.18
citronellol	106-22-9	1	1.42
phenylethyl acetate	103-45-7	1	1.15
cyclohexano, 2,1,1, methylethyl	13491-79-7	1	1.24
(z) 3-hexen-1-yl heptine carbonate	68698-58-8	1	1.23
4-tert-butylcyclohexyl acetate	32210-23-4	1	1.27
alpha terpinyl acetate	80-26-2	1	1.40
citronellyl acetate	150-84-5	1	1.32
4-tert-butylcyclohexyl acetate	32210-23-4	1	1.32
damascone	43052-87-5	1	1.35
benzene, 1,1 oxybis	101-84-8	1	1.34
dodecanal	112-54-9	1	1.53

octalactone	104-50-7	1	2.05
methyl ionone	127-51-5	1	1.60
beta ionone	79-77-6	1	1.41
methyl ionone	79-70-9	1	1.92
alpha methyl ionone	127-42-4	1	1.81
lilial	80-54-6	1	1.51
rose phenone	90-17-5	1	1.59
peach lactone	104-67-6	1	1.11
methyl ionone	127-43-5	1	1.74
orange crystals	93-08-3	1	1.38
amyl cinnamic aldehyde	122-40-7	1	2.30
dihydro methyl jasmonate	24851-98-7	1	1.66
hexyl cinnamaldehyde	101-86-0	1	2.83
ambrox	100679-85-4	1	1.94
hexyl cinnamaldehyde	101-86-0	1	4.27
benzyl Salicylate	110-27-0	1	1.97

The results unexpectedly demonstrate that within a perfume oil, many fragrance component notes are boosted in the presence of the polyhydroxy quaternary ammonium salt of this invention, i.e., normalized HS is greater than 1 compared to the same concentration of the fragrance oil in water without boosting agent of this invention.

EXAMPLE 9

The experiments in Example 9 were conducted in a manner similar to the one described in Example 8 except the following: Fragrance oil concentration was 0.01% in water with 10% boosting agent as compared to 0.01% fragrance oil in water with no boosting agent.

Results of the experiments are reported as relative fragrance component headspace abundance as normalized to 0.01% of the same commercial available fragrance oil in water (without boosting agent), i.e., the HS of 0.01% of the same commercially available fragrance oil in water is 1.0.

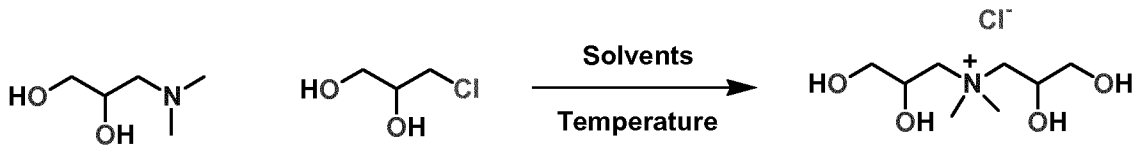
chemical name	CAS	water	with 10% boosting agent
butanoic acid, 2-methyl, ethyl ester	7452-79-1	1	0.76
isoamyl acetate	123-92-2	1	0.68
isoamyl acetate	123-92-2	1	0.67

ethyl methylvalerate	39255-32-8	1	0.72
2-octanone	111-13-7	1	0.94
hexyl acetate	142-92-7	1	0.58
limonene	138-86-3	1	0.58
melon heptenal	106-72-9	1	0.75
dihydromyrcenol	53219-21-9	1	1.22
terpinolene	586-62-9	1	1.02
linalool	78-70-6	1	1.09
camphor	76-22-2	1	0.87
cyclohexanone, 5methyl2-1-methylethyl trans	14073-97-3	1	2.19
benzyl acetate	140-11-4	1	0.25
allyl heptanoate	142-19-8	1	0.50
alpha terpineol	98-55-5	1	1.15
gardenol	93-92-5	1	0.73
citronellol	106-22-9	1	1.20
phenylethyl acetate	103-45-7	1	0.74
citral	141-27-5	1	0.88
alpha terpinolene	586-62-9	1	0.79
beta ionone	14901-07-6	1	2.35
4-tert-butylcyclohexyl acetate	32210-23-4	1	0.90
alpha terpinene	99-86-5	1	0.92
2,6 octadiene, 2,6 dimethyl	2792-39-4	1	0.76
4-tert-butylcyclohexyl acetate	32210-23-4	1	0.86
damascone	43052-87-5	1	0.94
benzene, 1,1 oxybis	101-84-8	1	0.69
beta methylionone	79-70-9	1	1.26
octalactone	104-50-7	1	0.61
decadienoic acid, ethyl ester	3025-30-7	1	1.72
methyl ionone	127-51-5	1	1.14
beta ionone	79-77-6	1	1.13
methyl ionone	79-70-9	1	1.53
alpha methyl ionone	127-42-4	1	1.18
lilial	80-54-6	1	1.09
rose phenone	90-17-5	1	1.81
methyl ionone	127-43-5	1	1.60
dihydro methyl jasmonate	24851-98-7	1	1.62
hexyl cinnamaldehyde	101-86-0	1	1.64
ambrox	100679-85-4	1	1.08
benzyl benzoate	120-51-4	1	1.63
hexyl cinnamaldehyde	101-86-0	1	2.17

Similar to the results in Example 8, the data presented in this Example 9 unexpectedly demonstrates that within a perfume oil, many fragrance component notes are boosted (e.g., normalized HS greater than 1) in the presence of the polyhydroxy quaternary ammonium salt (booster agent) of this invention.

EXAMPLE 10

Synthesis of Bis-(2,3-dihydroxypropyl) dimethylammonium Chloride



General Procedure: Dimethylaminopropanediol (20 g, 0.168 moles) and 3-Chloropropane-1,2-diol (18.5 g, 0.168 moles) were stirred in ethanol (40 mL) at 70 °C until the reaction is complete. The reaction was monitored by LCMS. Upon completion, the reaction was allowed to cool and the solution was poured to a mixture of acetone:methyl-tert-butyl ether (2:1, 300 mL) to oil out the product. The Supernatant was decanted and product was washed with a mixture of acetone/ methyl-tert-butyl ether (2 x 300 mL). The oil obtained was dried over high vacuum followed by freeze drying to obtain colorless oil/semisolid (> 90% yield). The pure product was characterized using ^{1}H NMR, ^{13}C NMR, and MS. Details on characterization as follows.

Analytical Instrumentation used:

LC MS: The MS of the compound was recorded using a Micromass Quattro Ultima LCMS system with Mass Lynx 4.1 software equipped with Agilent 1100 LC system. A solution of 50ppm was infused in the LCMS system using 50:50 Methanol: 5mM HCOOH as the mobile phase and ESI positive source.

NMR: A sample (144mg) was dissolved in D_2O (650 mL) and analyzed by ^{1}H and ^{13}C NMR using a Varian Eft-60 NMR Spectrometer (60 MHz) and the data processed using Nuts Pro (2D Professional version, Acorn NMR).

Characterization of Bis-(2,3-dihydroxypropyl) dimethylammonium Chloride:

^{1}H NMR (D_2O, 60 MHz) δ 3.22 (s, 6H, CH_3), 3.48 (s, 4H, CH_2), 3.57 (s, 4H, CH_2), 4.2 (bm, 2H, -CH),

^{13}C NMR (D_2O) δ 52.72 ($CH_{3's}$), 63.55 (-CH_2), 65.97 (-CH), 67.24 (-$CH_{2's}$)

LCMS (M-Cl) 194.25 (calcd), 194.22 (observed).

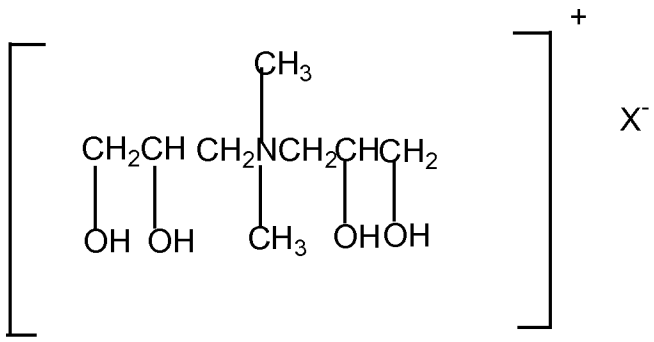
The above description is presented to enable a person skilled in the art to make and use the invention, and is provided in the context of a particular application and its requirements. Various modifications to the preferred embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the invention. Thus, this invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

Claims

1. A personal care composition comprising:

(i) from 0.0001 to 5% of a fragrance to impart a pleasant scent onto a human body to which the composition is applied;

(ii) from 0.01 to 20% by weight of a scent boosting agent which is a polyhydroxy quaternary ammonium salt of structure (I)



(I)

wherein X^- is selected from the group consisting of chloride, bromide, hydroxyl, sulphate, phosphate, methosulphate, carboxyl, citrate and tartrate; and

(iii) a cosmetically acceptable carrier.

2. The composition according to claim 1 wherein the polyhydroxy quaternary ammonium salt is bis(dihydroxypropyl)dimethylammonium chloride.

3. The composition according to claim 1 or claim 2 which is selected from the group consisting of leave-on skin lotions and creams, shampoos, hair conditioners, shower gels, toilette bars, antiperspirants, deodorants, dental products, shave creams, depilatories, lipsticks, foundations, mascara, sunless tanner and sunscreen lotions.

4. The composition according to any one of claims 1 to 3 wherein the fragrance is present in an amount from 0.001 to 2.5% by weight.

5. The composition according to any one of claims 1 to 4 wherein the fragrance comprises an ingredient selected from the group consisting of alpha or beta pinene, myrcene, geranyl alcohol or acetate, camphene, dl-limonene, alpha or beta phellandrene, tricyclene, terpinolene, allocimmane, geraniol, nerol, linanool, dihydrolinanool, citral, ionone, methyl ionone, citronellol, citronellal, alpha terpineol, beta terpineol, alpha fenchol, borneol, isoborneol, camphor, terpinen-1-ol, terpin-4-ol, dihydroterpineol, methyl chavicol, anethole, 1,4 or 1,8 cineole, geranyl nitrile, isobornyl acetate, linalyl acetate, caryophyllene, alpha cedrene, guaiol, patchouli alcohol, alpha or beta santalol, ethylene brassylate and mixtures thereof.

6. The composition according to any one of claims 1 to 5 wherein the fragrance comprises an ingredient selected from the group consisting of 1-butanol; 3-methyl acetate; 2-buten-1-ol 3-methyl acetate; beta pinene; hexyl acetate; limonene; 2,6 dimethyl hept-5-en-1-al; gamma terpinene; dihydromyrcenol; 2,4 dimethyl 3 cyclohexene 1 carbaldehyde; linalool; benzyl acetate; allyl heptoate; 2 tertiobutylcyclohexyl acetate 2; alpha isomethyl ionone and lily aldehyde.