



- (51) **International Patent Classification:**
A61K 8/06 (2006.01) *A61Q 17/00* (2006.01)
A61Q 9/04 (2006.01)
- (21) **International Application Number:**
PCT/US2012/033988
- (22) **International Filing Date:**
18 April 2012 (18.04.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/479,882 28 April 2011 (28.04.2011) US
- (71) **Applicant (for all designated States except US):** **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, Ohio 45202 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **SMITH, Charles, Robert** [GB/GB]; Park Cottage, Rosehill, Henley on Thames Oxfordshire RG9 3EB (GB). **SIMPSON, Naomi, Mary** [GB/GB]; 22A Hampton Road, Twickenham Middlesex TW2 5QB (GB). **DECKNER, George, Endel** [US/US]; 10572 Tanager Hills Drive, Cincinnati, Ohio 45249 (US).
- (74) **Common Representative:** **THE PROCTER & GAMBLE COMPANY**; c/o Eileen L. Hughett, Global

Patent Services, 299 East Sixth Street, Sycamore Building, 4th Floor, Cincinnati, Ohio 45202 (US).

- (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, 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, 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, MD, 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).

Published:

— with international search report (Art. 21(3))

(54) **Title:** DEPILATION METHOD AND KIT

(57) **Abstract:** A method of removing hair from skin is provided, comprising the steps of: (a) applying a protective composition to an area of skin on which unwanted hair is growing, wherein the protective composition comprises a sterically stabilised emulsion comprising a hydrophilic continuous phase, a hydrophobic dispersed phase and a steric emulsifier; (b) applying a depilatory composition to the area of skin to which the protective composition has been applied, the depilatory composition comprising a keratin reducing agent.



DEPILATION METHOD AND KIT

FIELD OF THE INVENTION

5 The present invention relates to a depilatory method and kit.

BACKGROUND OF THE INVENTION

Depilatory compositions are cosmetic hair removal formulations. They comprise keratin reducing agents, which attack the disulphide bonds in hair to weaken it, such that subsequent gentle
10 scraping and/or wiping completes severance of the hair from the skin and effects hair removal. Commercially, the most common keratin reducing agents are thioglycolates, which are typically formulated at high pH. An unwanted side effect of chemical depilation is that the depilatory composition comes into contact with and must have a relatively long residence time on skin to achieve effective hair removal and this long residence time combined with the alkaline
15 conditions needed for effective hair removal may give rise to skin irritation.

The above problem has been recognized in the art. Reference is made to US 4,401,663 and US 4,424,205, the disclosures of which are similar to one another. These documents teach to use certain compounds as topical analgesics and an example given of a situation in which it is suggested to use such materials is to reduce depilatory irritation. The carrier formulas disclosed
20 to be suitable for formulation with the analgesics include lotions and creams.

Reference is also made to US 2004/0219118, which discloses treatment with a "lipophilic" material before application of a thioglycolate-based reactive depilatory composition. Lipophilic materials exemplified in this patent application are oils, such as mineral oil. As shown hereinbelow, the present applicants have tested a range of lipophilic materials to determine their
25 ability to prevent thioglycolate penetration and, thereby, their ability to reduce or prevent skin irritation. Applicants have surprisingly found that oils, such as mineral oil, have no or a low ability to prevent thioglycolate penetration to the skin. There thus exists a need to develop a pre-treatment composition which better reduces skin irritation.

SUMMARY OF THE INVENTION

30 According to a first aspect of the invention, a method of removing hair from skin is provided, comprising the steps of:

- (a) applying a protective composition to an area of skin on which unwanted hair is growing, wherein the protective composition comprises a sterically stabilised emulsion comprising a hydrophilic continuous phase, a hydrophobic dispersed phase and a steric emulsifier;
- 5 (b) applying a depilatory composition to the area of skin to which the protective composition has been applied, the depilatory composition comprising a keratin reducing agent.

According to a second aspect of the invention, a depilatory kit is provided, comprising:

- 10 (a) a protective composition comprising a sterically stabilised emulsion comprising a hydrophilic continuous phase, a hydrophobic dispersed phase and a steric emulsifier;
- (b) a depilatory composition comprising an effective amount of a keratin reducing agent.

15 BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1. is a schematic view of a Franz Cell apparatus.

DETAILED DESCRIPTION OF THE INVENTION

The protective composition used in the method and comprised within the kit according to the invention comprises a sterically stabilized emulsion having a hydrophilic continuous phase and a hydrophobic dispersed phase. As demonstrated by the Franz Cell test data, below, the applicants have established that such emulsions are significantly better at preventing the penetration of keratin reducing agent, such as thioglycolate, to the skin, than oil on its own or than emulsions stabilized by traditional surfactants, and therefore result in reduced skin irritation. In addition, 25 applicants have established that the use of the present protective composition still permits hair weakening and destruction by the keratin reducing agent, so that reduced skin irritation can be achieved while removing hair.

It is not fully understood why the present protective composition provides such an effective barrier to penetration of keratin reducing agents. Without wishing to be bound by theory, it is 30 believed that the present, sterically stabilized emulsions may provide a better barrier than traditional emulsions, because the steric emulsifiers used herein are large molecules which are

relatively immobile when compared with traditional surfactants, This factor diminishes their detergent properties, thereby reducing or even eliminating their tendency to act to pull the hydrophobic phase off the skin following application and re-emulsify it. Removal of the hydrophobic phase which provides the barrier against thioglycolate penetration would increase such penetration giving a correspondingly lower reduction in irritation than might otherwise be achieved.

A reduction of thioglycolic acid penetration of 45% or more according to the Franz Cell test method may be shown to correlate to a significant and user-noticeable reduction in irritation.

10 The protective composition used in the method and comprised within the kit according to the invention comprises an emulsion having a hydrophilic continuous phase. Advantageously, the protective composition comprises from 15% to 80%, preferably from 20% to 70%, more preferably from 25% to 65% hydrophilic continuous phase by weight of the protective composition.

15 The hydrophilic continuous phase typically comprises water, but need not. In addition to or as an alternative to water, the hydrophilic continuous phase may comprise hydrophilic materials, such as polyhydric alcohols, ethoxylated and propoxylated polyols, polysaccharides, and mixtures thereof. Suitable polyhydric alcohols (polyols) include, but are not limited to, butylene glycol, 20 hexylene glycol, ethoxydiglycol, dipropylene glycol, phenyl ethyl alcohol, glycerin, 1,3-butanediol, 1,2-propanediol, isoprene glycol, sorbitol, polyethylene glycol, polypropylene glycol and mixtures thereof. Preferred polyols include glycerin, propylene glycol, panthenol and mixtures thereof.

25 Additionally, the hydrophilic continuous phase may comprise other polar solvents, such as alcohols, ketones and mixtures thereof. Examples of suitable polar solvents include phenyl ethyl alcohol, ethanol, isopropyl alcohol and mixtures thereof.

The hydrophilic continuous phase may additionally comprise hydrophilic skin active agents such as, but not limited to, vitamins, including hydrophilic ascorbic acid compounds and vitamin B3 30 compounds; azelaic acid; gallic acid and its derivatives; N-acetyl glucosamine; panthenol and mixtures thereof.

The protective composition used in the method and comprised within the kit according to the invention comprises an emulsion having a hydrophobic dispersed phase. Advantageously, the protective composition comprises from 20% to 85%, preferably from 20 to 75%, more preferably from 35% to 70% hydrophobic dispersed phase by weight of the protective composition.

5

The hydrophobic dispersed phase may comprise one or more oils. As used herein, the term "oil" includes, but is not limited to any non-aqueous substance that is practically insoluble in water according to the United States' Pharmacopeia (USP) definition in 31/NF 26 Vol. 2 General Notices, Page Xvii. (which, according to that definition, means that more than 10,000 parts of

10

water are needed to dissolve 1 part solute) and is liquid at 20°C.

The oil may be selected from natural oil, synthetic oil, silicone oil and mixtures thereof.

Non-limiting examples of suitable natural oils include Acetylated Castor Oil, Acetylated Hydrogenated Castor Oil, Actinidia Chinensis (Kiwi), Seed Oil, Adansonia Digitata Oil, Aleurites Moluccana Seed Oil, Anacardium Occidentale (Cashew) Seed Oil, Arachis Hypogaea (Peanut) Oil, Arctium Lappa Seed Oil, Argania Spinosa Kernel Oil, Argemone Mexicana Oil, Avena Sativa (Oat) Kernel Oil, Bertholletia Excelsa Seed Oil, Borago Officinalis Seed Oil, Brassica Campestris (Rapeseed) Seed Oil, Calophyllum Tacamahaca Seed Oil, Camellia Japonica Seed Oil, Camellia Kissi Seed Oil, Camellia Oleifera Seed Oil, Canola Oil, Caprylic/Capric/Lauric Triglyceride, Caprylic/Capric/Linoleic Triglyceride, Caprylic/Capric/Myristic/Stearic Triglyceride, Caprylic/Capric/Stearic Triglyceride, Caprylic/Capric Triglyceride, Carthamus Tinctorius (Hybrid Safflower) Seed Oil, Carthamus Tinctorius (Safflower) Seed Oil, Carum Carvi (Caraway) Seed Oil, Carya Illinoensis (Pecan) Seed Oil, Castor Oil Benzoate, Chenopodium Quinoa Seed Oil, Cibotium Barometz Oil, Citrullus Vulgaris (Watermelon) Seed Oil, Cocos Nucifera (Coconut) Oil, Cod Liver Oil, Coffea Arabica (Coffee) Seed Oil, Coix Lacryma-Jobi (Job's Tears) Seed Oil, Corylus Americana (Hazel) Seed Oil, Corylus Avellana (Hazel) Seed Oil, Cucumis Sativus (Cucumber) Oil, Cucurbita Pepo (Pumpkin) Seed Oil, Daucus Carota Sativa (Carrot) Seed Oil, Elaeis Guineensis (Palm) Kernel Oil, Elaeis Guineensis (Palm) Oil, Gossypium (Cotton) Seed Oil, Helianthus Annuus (Hybrid Sunflower) Oil, Helianthus Annuus (Sunflower) Seed Oil, Hippophae Rhamnoides Oil, Human Placental Lipids, Hydrogenated Canola Oil, Hydrogenated Castor Oil, Hydrogenated Castor Oil Laurate, Hydrogenated Castor Oil Triisostearate, Hydrogenated Coconut Oil, Hydrogenated Cottonseed Oil, Hydrogenated C12-18 Triglycerides, Hydrogenated Fish Oil, Hydrogenated

30

- Lard, Hydrogenated Menhaden Oil, Hydrogenated Mink Oil, Hydrogenated Olive Oil, Hydrogenated Orange Roughy Oil, Hydrogenated Palm Kernel Oil, Hydrogenated Palm Oil, Hydrogenated Peanut Oil, Hydrogenated Rapeseed Oil, Hydrogenated Shark Liver Oil, Hydrogenated Soybean Oil, Hydrogenated Sunflower Seed Oil, Hydrogenated Tallow,
- 5 Hydrogenated Vegetable Oil, *Isatis Tinctoria* Seed Oil, *Juglans Regia* (Walnut) Seed Oil, Lauric/Palmitic/Oleic Triglyceride, *Umnanthes Alba* (Meadowfoam) Seed Oil, *Unum Usitatissimum* (Linseed) Seed Oil, *Lupinus Albus* Seed Oil, *Macadamia Integrifolia* Seed Oil, *Macadamia Ternifolia* Seed Oil, Maleated Soybean Oil, *Mangifera Indica* (Mango) Seed Oil, Marmot Oil, *Melaleuca Alternifolia* (Tea Tree) Leaf Oil, *Melia Azadirachta* Seed Oil, *Melissa*
- 10 *Officina lis* (Balm Mint) Seed Oil, Menhaden Oil, Mink Oil, *Moringa pterygosperma* Seed Oil, Mortierella Oil, Neatsfoot Oil, *Nelumbium Speciosum* Flower Oil, *Nigella Sativa* Seed Oil, *Oenothera Biennis* (Evening Primrose) Oil, *Olea Europaea* (Olive) Fruit Oil, *Olea Europaea* (Olive) Husk Oil, Orange Roughy Oil, *Orbignya Cohune* Seed Oil, *Orbignya Oleifera* Seed Oil, *Oryza Sativa* (Rice) Bran Oil, *Oryza Sativa* (Rice) Germ Oil, Ostrich Oil, Oxidized Corn Oil,
- 15 Oxidized Hazel Seed Oil, *Papaver Orientale* (Poppy) Seed Oil, *Passiflora Edulis* Seed Oil, *Persea Gratissima* (Avocado) Oil, *Pistacia Vera* Seed Oil, Placental Lipids, *Prunus Amygdalus Amara* (Bitter Almond) Kernel Oil, *Prunus Amygdalus Dulcis* (Sweet Almond) Oil, *Prunus Armeniaca* (Apricot) Kernel Oil, *Prunus Avium* (Sweet Cherry) Seed Oil, *Prunus Cerasus* (Bitter Cherry) Seed Oil, *Prunus Persica* (Peach) Kernel Oil, *Pyrus Malus* (Apple) Oil, *Ribes Nigrum* (Black
- 20 Currant) Seed Oil, *Ricinus Communis* (Castor) Seed Oil, *Rosa Canina* Fruit Oil, *Rosa Moschata* Seed Oil, Salmon Oil, *Salvia Hispanica* Seed Oil, *Santalum Album* (Sandalwood) Seed Oil, *Sesamum Indicum* (Sesame) Seed Oil, Shark Liver Oil, *Solanum Lycopersicum* (Tomato) Seed Oil, Soybean Lipid, Sphingolipids, *Taraktogenos Kurzii* Seed Oil, *Telphairia Pedata* Oil, Vegetable Oil, *Vitis Vinifera* (Grape) Seed Oil, *Zea Mays* (Corn) Germ Oil, *Zea Mays* (Corn) Oil
- 25 and mixtures thereof.

Non-limiting examples of suitable synthetic oils include mineral oil, isopropyl pamitate, isopropyl stearate, isohexadecane, isododecane, polyglyceryl triisostearate and mixtures thereof.

- 30 Non-limiting examples of suitable silicone oils include dimethicones (including partial esters of dimethicones and fatty acids derived from natural/synthetic oils), cyclomethicones, polydimethylsiloxanes, phenyl trimethicones, trimethyl pentaphenyl trisiloxane, dimethicone copolyols and mixtures thereof. Advantageously, the hydrophobic continuous phase of the

emulsion comprises dimethicone having a viscosity of 1 to 10,000 centistoke, preferably 5 to 1000 centistoke, more preferably 25 to 500 centistoke.

Non-limiting examples of commercially available silicone oils include Dow Corning 200 fluid,
5 Dow Corning 244, Dow Corning 245, Dow Corning 344, and Dow Corning 345, (commercially available from Dow Corning Corp.); SF-1204 and SF-1202 Silicone Fluids (commercially available from G.E. Silicones), GE 7207 and 7158 (commercially available from General Electric Co.); and SWS-03314 (commercially available from SWS Silicones Corp.), the Viscasil series (sold by General Electric Company), SF 1075 methyl-phenyl fluid (sold by General Electric
10 Company) and 556 Cosmetic Grade Fluid (sold by Dow Corning Corp.), SF1066 organosilicone surfactant (sold by General Electric Company). Advantageously, where there is a choice, these oils will be selected to have a viscosity within the above-defined ranges.

The protective composition may comprise from 0.75% to 15%, preferably from 1% to 10%, more preferably from 1% to 8% wax by weight of the protective composition.

- 15 As used herein, the term "wax" includes, but is not limited to, any hydrophobic material that is:
- Solid at 25°C
 - practically insoluble in water according to the United States' Pharmacopeia (USP) definition in 31/NF 26 Vol. 2 General Notices, Page Xvii. (which, according to that definition, means that more than 10,000 parts of water are needed to dissolve 1 part
20 solute);
 - has an onset temperature measured according to the DSC Method, defined hereinbelow, which is 10°C or greater; and
 - comprises lipids, silicones or mixtures thereof.

The wax may comprise natural wax, synthetic wax, silicone wax, or mixtures thereof.

25 Non-limiting examples of suitable natural waxes include Abies Alba Leaf Wax, Acacia Dealbata Leaf Wax, Acacia Farnesiana Flower Wax, Beeswax, Ceresin, Cetyl Esters, Cistus Labdaniferus Flower Wax, Aurantium Amara (Bitter Orange) Flower Wax, Aurantium Dulcis (Orange) Peel Wax, Copernicia Cerifera (Carnauba) Wax, Eclipta Prostrata Wax, Euphorbia Cerifera
30 (Candelilla) Wax, Helichrysum Angustifolium Wax, Jasminum Officinale (Jasmine) Flower Wax, Jasminum Sambac (Jasmine) Flower Wax, Jojoba Esters, Jojoba Wax, Lanolin Wax,

Lavandula Angustifolia (Lavender) Flower Wax, Lawsonia Inermis Wax, Mink Wax, Montan Acid Wax, Montan Wax, Myrica Cerifera (Bayberry) Fruit Wax, Ocimum Tenuiflorum Wax, Olive Wax, Oryza Sativa (Rice) Bran Wax, Ouricury Wax, Palm Kernel Wax, Persea Gratissima (Avocado) Wax, Pistacia Lentiscus Leaf Wax, Polianthes Tuberosa Flower Wax, Pyrus Malus (Apple) Peel Wax, Ribes Nigrum (Black Currant) Wax, Rosa Centifolia Flower Wax, Salvia Sclarea (Clary) Wax, Shellac Wax, Simmondsia Chinensis (Jojoba) Butter, Soft Olive Wax, Spent Grain Wax, Stipa Tenacissima Wax, Sunflower Seed Wax, Vegetable Wax, Vitis Vinifera (Grape) Leaf Wax and mixtures thereof.

Non-limiting examples of suitable synthetic waxes include Hydrogenated Japan Wax, Hydrogenated Jojoba Oil, Hydrogenated Jojoba Wax, Hydrogenated Microcrystalline Wax, Hydrogenated Rice Bran Wax, Hydrolyzed Beeswax, Microcrystalline Wax, Oxidized Beeswax, Oxidized Microcrystalline Wax, Ozokerite, Paraffin, PEG-6 Beeswax, PEG-8 Beeswax, PEG-12 Beeswax, PEG-20 Beeswax, PEG-12 Carnauba, Potassium Oxidized Microcrystalline Wax, Sulfurized Jojoba Oil, Synthetic Beeswax, Synthetic Candelilla Wax, Synthetic Carnauba, Synthetic Japan Wax, Synthetic Jojoba Oil, Synthetic Wax and mixtures thereof.

Non-limiting examples of suitable silicone waxes include DC2503 Cosmetic Wax, DC580 wax, DC AMS-C30 Cosmetic Wax, C30-45 Alkyl Methicone, DC Silkywax 10, Hexamethyldisiloxane, DC ST-Wax 30, C30-45 Alkyldimethylsilyl Polypropylsilsesquioxane, DC SW-8005 resin wax, C26 - 28 Alkyl Dimethicone, C26 - 28 Alkyl Methicone, Polyphenylsilsesquioxane and mixtures thereof.

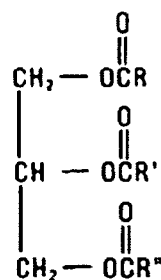
Advantageously, the wax comprises beeswax, carnauba wax, candelilla wax, jojoba wax, paraffin wax, microcrystalline wax, ozokerite, arachidyl behenate, or mixtures thereof.

The presence of some wax in the hydrophobic dispersed phase of the protective composition may surprisingly further reduce penetration by thioglycolic acid in comparison with a dispersed phase comprising oils alone, while not diminishing depilation efficacy. Without wishing to be bound by theory, applicants believe that this additional effect may be because the wax militates against the tendency otherwise exhibited by oils to ball up on skin and therefore disrupt the barrier. The presence of wax may also ensure that a thin barrier of the protective composition can be evenly distributed across the skin, even at a low dosage per unit area. The wax may form a substantive barrier across the skin (enhanced by an amorphous mix of the oil & wax) that is chemically

resistant to ingress from the thioglycolate (or other reducing) actives, therefore physically reducing the ability for the harsh chemistry to come into contact with the skin. This reduction in contact means that the stratum corneum may be maintained in a better state than if no barrier were present with correspondingly reduced signs of irritation, such as erythema, tingling and stinging.

At the same time as reducing contact between the depilatory active ingredient and the skin, the present compositions still permit the depilatory composition to attack and degrade the unwanted hair growing on that skin to achieve hair removal. Why this should be is not fully understood, but it may simply be due to the fact that less of the protective composition adheres to the hairs than to the skin.

The hydrophobic continuous phase may comprise one or more triglycerides, the or each triglyceride having the following formula:



wherein R, R' and R'' may be the same as or different from one or both of the others, wherein each of R, R' and R'' is a fatty acid and wherein the or each triglyceride is solid at 25°C

Advantageously, the or each triglyceride has an onset temperature of less than 65°C as measured by Differential Scanning Calorimetry. At and above an onset temperature of 65°C, the composition may become increasingly difficult to apply and may, in addition, crack and fall off in use.

Suitable oils from which triglycerides may be formed from include, but are not limited to, the oils listed herein. Suitable fatty acids for formation of triglycerides include, but are not limited to, Myristoleic acid, Palmitoleic acid, Sapienic acid, Oleic acid, Linoleic acid, α-Linolenic acid, Arachidonic acid, Eicosapentaenoic acid, Docosahexaenoic acid, Lauric acid (C₁₂), Myristic acid (C₁₄), Palmitic acid (C₁₆), Stearic acid (C₁₈), Arachidic acid (C₂₀) and mixtures thereof.

Specific sources of triglycerides suitable for inclusion in the protective composition include include Butter, Shea Butter, Butyrospermum Parkii, Lipex Shea, Theobroma Cacao (Cocoa) Seed Butter, Cocoa Butter, Hydrogenated Shea Butter, Hydrogenated Cocoa Butter, Irvingia Gabonensis Kernel Butter, Tallow, Lard, Mangifera Indica (Mango) Seed Butter, Kokum Butter
5 and mixtures thereof. The triglyceride(s) may fall under the definition of “wax” or “oil” as used herein and, in such a case, should be included as a wax or oil for the purposes of determining the proportions of wax or oil.

The hydrophobic dispersed phase may comprise skin active agents such as, but not limited to oil soluble vitamins, such as vitamin E derivatives, including vitamin E acetate and tocopherol
10 nicotinate; oil-soluble vitamin A derivatives, such as retinyl palmitate; lanolin; ceramides; sterols and sterol esters; salicylic acid; camphor; eucalyptol; essential oils and mixtures thereof. These materials may fall under the definition of “wax” or “oil” as used herein and, in such a case, should be included as a wax or oil for the purposes of determining the proportions of wax or oil.

15 The protective composition used in the method and comprised within the kit according to the invention may include further ingredients such as, but not limited to metal oxides, organic and inorganic dyes, lakes, micas, flavourings, perfumes and mixtures thereof.

The protective composition used in the method and comprised within the kit according to the
20 invention comprises a steric emulsifier, which sterically stabilises the emulsion, such that surfactants are not required. As used herein, the term “steric emulsifier” means an amphipathic polymer which comprise a hydrophilic backbone and hydrophobic side chains. Advantageously, the amphipathic polymer comprises from 0.5 to 5%, preferably from 1% to 3.5% of hydrophobic side chains by weight of the amphipathic polymer.

25 Advantageously, the steric emulsifier is a sparingly soluble or less than sparingly soluble in water. The term “sparingly soluble” in water is defined in the United States’ Pharmacopeia (USP) definition in 31/NF 26 Vol. 2 General Notices, Page Xvii. (according to that definition, “sparingly soluble” means that 30-300 parts of water are needed to dissolve 1 part solute).

30 Small amounts of surfactants may be present in the protective composition, but they are preferably absent. As used herein, a “surfactant” is an amphipathic material that is not a steric emulsifier. Surfactants may be present in the following amounts:

(a) Surfactants having an HLB from 1 to 6 may be present in an amount of less than or equal to 3%, preferably less than or equal to 1.5% and more preferably 0% by weight of the protective composition;

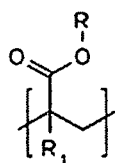
(b) Surfactants having an HLB from 7 to 18 may be present in an amount of less than or equal to 0.5%, preferably 0% by weight of the protective composition.

The HLB (the "Hydrophilic-Lipophilic Balance") value system is fully described, and values for various materials are provided, in the publication *The HLB System, A Time-Saving Guide to Emulsifier Selection* (published by ICI Americas Inc., Wilmington, Del.; 1984).

Advantageously, the protective composition comprises from 0.01 % to 5%, preferably from about 0.05% to about 3%, more preferably from 0.05% to 1% by weight of steric emulsifier.

According to one embodiment, the steric emulsifier comprises a copolymer comprising a monomeric mixture comprising:

(a) 95.9% to 98.8% by weight of the copolymer of an olefinically unsaturated carboxylic monomer having the following structure:



wherein R is hydrogen, methyl or ethyl and R₁ is a substituent selected from the class consisting of hydrogen, halogen, and the cyanogen (-C≡N) groups, monovalent alkyl radicals, monovalent alkaryl radicals and monovalent cycloaliphatic radicals. Within this class, acrylic, methacrylic, and ethacrylic acid monomers are preferred. Another suitable olefinically unsaturated carboxylic monomer is maleic anhydride or maleic acid.

(b) from 1% to 3.5% by weight of the copolymer of an acrylate ester of the above structural formula, wherein R is an alkyl radical containing 10 to 30 carbon atoms and R₁ is hydrogen, methyl or ethyl;

(c) less than or equal to 0.6%, preferably from 0.1% to 0.6% by weight of the copolymer of a polymerizable cross-linking polyalkenyl polyether of a polyhydric alcohol containing more than one alkenyl ether group per molecule of the polyether, wherein the parent polyhydric alcohol contains at least 3 carbon atoms and at least 3 hydroxyl groups.

5

Advantageously, the copolymer comprises:

- (a) from 96% to 97.9% by weight of the copolymer of acrylic acid;
- (b) from 2.5% to 3.5% by weight of the copolymer of acrylic ester, wherein the alkyl group contains 12 to 22 carbon atoms and R_1 is methyl;
- (c) from 0.2% to 0.4% of cross-linking monomer by weight of the copolymer, the cross-linking monomer preferably being selected from the group consisting of allyl pentaerythritol, trimethylolpropane diallylether and allyl sucrose.

10

Commercially available examples of polymers within this class include Carbomer 1342

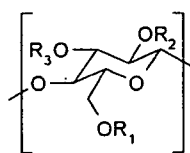
15

(available as Carbopol 1342 from Lubrizol), Carbomer 1382 (Carbopol 1382 from Lubrizol), Carbopol® Ultrez 21 polymer, Carbopol® Ultrez 20, Pemulen TR-1 & Pemulen TR-2 (available from Lubrizol).

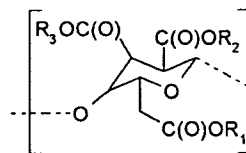
According to another embodiment, the steric emulsifier comprises alkyl substituted hydroxyethyl

20

cellulose ether copolymers of the structure:



Alkyl Modifier attached via Ether linkage



Alkyl Modifier attached via Ester linkage

Whereby a long chain alkyl modifier group having 8 to 25 carbon atoms can be attached to the cellulose ether substrate via an ether or ester linkage (typically attached at position R_1), the remaining R-groups being either H, methyl or ethyl. The monomer containing the long chain hydrocarbon group should be present in an amount of about 0.1% to 4.0% by weight of the copolymer, with the remaining monomers having R_1 , R_2 & R_3 groups of H, methyl or ethyl.

25

Commercially available examples of polymers within this class include Natrosol Plus 330, Natrosol B and Natrosol (available from Aqualon Ashland), most preferably Natrosol Plus 330.

Another steric emulsifier according to the invention is poly(maleic anhydride 1-octadecene). This material is commercially available from Polysciences Inc.

The protective composition used in the method and comprised within the kit according to the invention may include further ingredients such as, but not limited to metal oxides, organic and inorganic dyes, lakes, micas, flavourings, perfumes and mixtures thereof.

Any depilatory composition comprising a suitable keratin reducing agent may be used in the present method and included in the present kit. Non-limiting examples of suitable keratin reducing agents include: sulphide salts such as Li_2S , Na_2S , K_2S , MgS , CaS , SrS or BaS , hydrogen sulphide salts such as NaSH or KSH ; thioglycol; thioglycerol; thioglycolamide; thioglycolhydrazide; thioglycolic acid; thioglycolate salts (such as potassium thioglycolate, calcium thioglycolate, ammonium thioglycolate, diammonium dithioglycolate, glyceryl monothioglycolate, or monoethanolamine thioglycolate); thiosalicylic acid; thiomalic acid; ammonium thiolactate; monoethanolamine thiolactate; dithioerythritol; 2-mercaptopropionic acid; 1,3-dithiopropanol; glutathione; dithiothreitol; cysteine; homocysteine; N-acetyl-L-cysteine and cysteamine. Advantageously, the keratin reducing agent is comprised within the depilatory composition in an amount from 0.3% to 20%, preferably from 0.8% to 15%, more preferably from 1% to 10% by weight of the depilatory composition.

Advantageously, the depilatory composition may comprise at least one thioglycolate salt or thioglycolic acid acting as a hair removal agent when the depilatory composition is applied to unwanted hair. Preferably, the depilatory composition comprises sodium, potassium, magnesium, calcium, beryllium, strontium, zinc, monoethanolamine, ammonium, tetralkylammonium, imidazolium, pyridinium, phosphonium or glyceryl thioglycolate salts, or mixtures thereof, which may include dianion forms of thioglycolate. More preferably, the depilatory composition comprises at least one of sodium, potassium, magnesium or calcium thioglycolate, or mixtures thereof. Even more preferably the depilatory composition comprises potassium or calcium thioglycolate, or mixtures thereof.

The pH of the depilatory composition may advantageously be in the range of from 6 to 13.8, preferably from greater than 7 to 13, more preferably from 9 to 12.9, even more preferably from 10 to 12.8, even more preferably still from 12 to 12.75 and yet more preferably from 12.3 to 12.6 to improve the efficacy of the active ingredient. The depilatory composition may, in a preferred
5 embodiment, comprise at least one base to control the pH. Preferably, the depilatory composition comprises potassium hydroxide; sodium hydroxide; lithium hydroxide; calcium hydroxide; barium hydroxide; caesium hydroxide; sodium hydroxide; ammonium hydroxide; strontium hydroxide; rubidium hydroxide; magnesium hydroxide; zinc hydroxide; sodium carbonate; pyridine; ammonia; alkanolamides (including monoethanolamine, diethanolamine,
10 triethanolamine), phosphates (including tetrasodium phosphate), arginine or mixtures thereof. More preferably, the depilatory composition comprises at least one buffering base, even more preferably the depilatory composition comprises calcium hydroxide, magnesium hydroxide; barium hydroxide; strontium hydroxide; zinc hydroxide; arginine or mixtures thereof. Still more preferably the depilatory composition comprises calcium hydroxide; magnesium hydroxide, zinc
15 hydroxide, sodium hydroxide, potassium hydroxide or mixtures thereof. Even more preferably still, the depilatory composition comprises calcium hydroxide, sodium hydroxide or mixtures thereof.

In an advantageous embodiment, the base is present at a concentration of from 0.1% to 10.0%,
20 more preferably from 0.5% to 8.0% and even more preferably from 1.0% to 5.0%, by weight of the depilatory composition.

The concentration of water in the depilatory composition is preferably at least 40%, more preferably from 50% to 98%, even more preferably from 60% to 95% and even more preferably
25 still from 70% to 90%, by weight of the depilatory composition.

The depilatory composition may optionally comprise a thickening agent. A representative but not exhaustive list can be found in "The Encyclopaedia of Polymers and Thickeners for Cosmetics" compiled and edited by Robert Y. Lochhead, PhD and William R. Fron, Department of Polymer
30 Science, University of Southern Mississippi. Exemplary classes of thickening agents include gums, carbomers, polymers and copolymers of acrylic acid, associated thickeners, layered silicates/clays and natural polymers (including polysaccharides). One or more thickening agents may be included in the aqueous depilatory composition. The thickening agent may be present at

a level of from about 0.01% to about 20%, preferably from about 0.1% to about 10% by weight of the depilatory composition.

The depilatory composition may also include other skin care ingredients such as conditioning agents selected from the group consisting of humectants, moisturizers, or skin conditioners (including mineral oil; almond oil; chamomile oil; jojoba oil; avocado oil; shea butter, niacinamide and glycerine); skin rejuvenation compositions (for example targeted for fine lines, wrinkles and uneven skin tone, including retinoids), cosmetic compositions; anti-inflammatory agents (including corticosteroids); anti-oxidants (including flavonoids) radical scavengers; sunscreen agents; skin cooling or warming agents and the like. The depilatory composition may comprise one or more skin care ingredients present in an amount of from about 0.001% to about 10%, more preferably from about 0.01% to about 7%, and even more preferably from about 0.025% to about 5%, by weight of the depilatory composition.

An accelerant may be employed in the depilatory composition. This optional component accelerates the rate of depilatory action of the depilatory agent. Suitable accelerants include, but are not limited to, urea; thiourea; dimethyl isosorbide; arginine salts; ethoxydiglycol; propylene glycol and methylpropyldiol. The accelerant may be present in a concentration range of from 0.5% to 10%, more preferably from 2% to 8% and even more preferably from 2% to 5% by weight of the depilatory composition.

The depilatory composition may further comprise components known, conventionally used, or otherwise effective for use in cosmetic compositions, such as dyes; pigments (including ultra marines and talc); anionic, cationic, non-ionic and/or amphoteric or zwitterionic surfactants, polymers (including hydrophobically modified polymers); dispersing agents; solvents; lubricants; fragrances; preservatives; chelants, proteins and derivatives thereof, plant materials (e.g. aloe, chamomile and henna extracts); silicones (volatile or non-volatile, modified or non-modified); film-forming agents; film forming promoters and mixtures thereof.

The depilatory composition may be formulated in any common delivery form, such as a cream or lotion. Alternatively, it may be delivered on a substrate, such as a thin film of depilatory composition coated onto the substrate. The substrate may be configured in any suitable form, such as a strip, mask or patch.

In addition to the protective composition and the depilatory composition, the kit according to the second aspect of the invention may comprise one or more of:

- (a) A make-up removal composition and/or a make-up removal wipe;
 - (b) Means for removal of the protective composition and the depilatory composition
5 following use, which means may comprise one or more of a tool, such as a scraper or a spatula; or a wipe;
 - (c) A post-treatment composition skin care composition to be applied to the area of skin from
10 which hair has been removed. Such a post-treatment skin care composition may comprise ingredients to promote skin conditioning; moisturizers, skin rejuvenation compositions (targeted for fine lines, wrinkles and uneven skin tone, for example), cosmetic compositions (e.g., foundation, rouge), sunscreens and the like. The post-treatment skin care composition may be leave-on or a rinse-off composition.
 - (d) Instructions regarding how to use the various elements of the kit, which instructions may
comprise one or more elements of the method as defined herein.
- 15 Prior to applying the method or using the kit according to the present invention, a user should advantageously remove all make-up from the skin, to ensure good adherence and effective application of both the protective composition and the depilatory composition.

The method according to the first aspect of the invention comprises the step of applying the above-defined protective composition to an area of skin on which unwanted hair is growing. The
20 area of skin may be located on any part of the human body, but is preferably on the face, more preferably on an area of skin adjacent to the vermillion lip and more preferably still on an area above the upper vermillion lip.

Advantageously, the protective composition is not just applied to the area to be depilated, but also to an immediately juxtaposing area thereabout (that is, the protective composition is applied
25 to an area of skin which is greater than just the area which is to be depilated).

Advantageously, the user will apply from 0.3 – 2mg of protective composition per square centimetre of skin, preferably from 0.4 – 1mg/cm², more preferably from 0.4 to 0.7mg/cm².

Following application, the protective composition is advantageously massaged into the skin. Preferably, massaging is effected for at least 10 seconds, and, more preferably, massaging is effected as a circular motion. Without wishing to be bound by theory, it is believed that the protective composition may trap hair within it thereby shielding it from the to-be-applied
5 depilatory composition; massaging may help to release the hairs from the skin and ensure improved access thereto by the depilatory composition.

The method according to the first aspect of the invention comprises the subsequent step of applying the above-defined depilatory composition to an area of skin on which unwanted hair is growing and to which protective composition has already been applied. Advantageously, the user
10 will apply a layer of depilatory composition which is from 0.1mm to 5mm, preferably from 0.3 to 3mm, more preferably from 0.5 to 2mm in thickness.

Subsequently, according to the method of the first aspect of the invention, the depilatory composition is advantageously left in place for at least 1 minute, preferably from 1 to 10 minutes, more preferably from 3 to 10 minutes, depending on the thickness of the hair and the hair
15 removal efficacy of the depilatory composition (which, in turn, is dependent upon the concentration of keratin reducing agent in the depilatory composition).

Subsequently, according to the method of the first aspect of the invention, the protective composition and the depilatory composition are advantageously removed. This may be achieved using one or more of a cotton wool ball, pad or wand, a tissue, a cloth, or a tool, such as a spatula
20 or a scraper. Advantageously, the skin from which hair has been removed is then rinsed with water.

In an advantageous subsequent step, a post-treatment skin care composition may be applied to the area of skin from which hair has been removed. Such a post-treatment skin care composition may comprise ingredients to promote skin conditioning; moisturizers, skin rejuvenation
25 compositions (targeted for fine lines, wrinkles and uneven skin tone, for example), cosmetic compositions (e.g., foundation, rouge), sunscreens and the like. The post-treatment skin care composition may be leave-on or a rinse-off composition.

Differential Scanning Calorimetry (DSC) Melting Method

This method is the American Oil Chemists' Society Method Cj 1-94, as reapproved in 2009 and
30 it determines the "onset temperature" (that is the temperature of onset of melting) of oils and fats

by differential scanning calorimetry (DSC).

Apparatus

1. Aluminum capsules.
2. DSC instrument, capable of holding temperature at -60°C and achieving a temperature of
5 80°C .

Reagents

1. Indium, powder—60 mesh, 99.999%, such as Aldrich Chemical Co., Milwaukee, WI 53233, or equivalent.
2. *n*-Decane, 99+%, such as Aldrich Chemical Co., Milwaukee, WI 53233, or equivalent.
- 10 3. Methyl stearate, 99%, such as Aldrich Chemical Co., Milwaukee, WI 53233, or equivalent.

Procedure

1. Standardization of equipment—Proceed with the normal standardization using both indium and *n*-decane as reference standards. Follow instrument manual for adjustment to lock
15 onto these two reference points and flatten the baseline slope as much as possible when empty pans are analyzed. Analyze the secondary standard (methyl stearate). Weigh 5 mg of the standard into the same kind of pan which will be used for the test portion (if hermetically sealed, it may be reused at a later date). Use the method sequence in Procedure, 2–7 to obtain the melting point onset (because of the high purity, only a 2 min hold is necessary for the standard after
20 crystallization). Be certain that the heating rate during the definitive heating pattern is at $5^{\circ}\text{C}/\text{min}$. The melting point onset should be within $\pm 2.00^{\circ}\text{C}$ of 36.5°C . If not, recheck calibration.

Note—be certain to use identical capsules for the test portion as those used for reference standards and the instrument blank reference.

- 25 2. Melt each test portion completely and weigh 7 ± 0.200 mg of each test portion into the same kind of capsule used for the blank and reference samples (aluminum) and seal to minimize oxidation and other changes.

3. Place capsules in DSC at room temperature.
4. Heat rapidly to 80°C and hold for 10 min.
5. Cool to -60°C at 10°C/min and hold for 30 min.
- 5 6. Heat to 80°C at 5°C/min.
7. Use the baseline obtained for an empty capsule analysis from the final melt segment of the program to define the position of the baseline under the sample peaks. Overlay the final melting curve of the test portion over the curve for the empty capsule with a flexible ruler or other curve guide to define the baseline of the test portion back to where it intersects the initial deviation of the melting curve from its baseline. The baseline beneath the test portion should be a continuation of the baseline where there are no sample components present. If a shift has occurred in the heat capacity of the test portion after the melt, it will be evident relative to the baseline of the empty capsule. Have the instrument calculate the sigmoid baseline if it can, or connect the end of the peak point with the last point in which the test portion was in conjunction with the baseline of the empty capsule.

Results

Determine the onset temperature in °C, which, if not computer generated, is an extrapolation to baseline of the steepest slope of the principal peak.

Franz cell method

20 Principle and Scope:

This method is applicable for using Franz cell apparatus for the *in-vitro* assessment of penetration of thioglycolic acid (TGA) and its salts through a skin mimic after the application of a depilatory composition following pre-treatment with a protective composition.

- Penetrated TGA is quantified using Reverse Phase High Performance (or Pressure) Liquid
25 Chromatography (RP-HPLC) with external standard quantitation at 240nm.

Method

Reference is made to Figure 1 and to the reference numerals therein:

1. Prepare the Vitro-Skin (IMS Vitro-Skin®, Catalogue number: P&G1013, made by IMS Inc., Portland, Maine, USA) samples by cutting 8x6.2cm segments and placing them textured side up on the racks into a hydration chamber (manufactured & sold by IMS) containing a 14.7% glycerol solution. The hydration chamber should be sealed and the vitro-skin left to hydrate at
5 room temperature and a humidity of 80.4% $\pm$ 3.5% for 24 hours.

2. Prepare the receptor solution for the Franz-cell by mixing 1.90ml formic acid (98%wt+ Fluka, by Sigma Aldrich, or equivalent), 30ml acetonitrile (RP-HPLC grade) and 968.1ml water (RP-HPLC grade). Set up the static Franz cell (Permeagear or equivalent, 15mm diameter unjacketed cell with a 12ml receptor volume) by clamping it in place over suitable stirrer plates (not shown)
10 and add a small stirrer bar (6) to each cell, fill the receptor cell (2) to the brim with the required amount of receptor solution.

3. Once hydrated, remove a sheet of vitro-skin from the hydration chamber and lay textured side up on a clean flat surface then dose 100 μ l ($\sim$ 2mg/cm²) of protective composition (not shown) onto the vitro-skin and spread evenly over the surface by rubbing for 30 seconds with a gloved
15 finger.

4. Using a scalpel blade cut the vitro-skin segment (3) into two equal sections, each large enough to completely cover the top of the cell. Place the relevant size o-ring (5) (22mm, for the specified Franz-cell) onto each section of the vitro skin and dose to 150mg/cm² of depilatory composition (4) ("Veet Normal Skin Hair Removal Cream" or an equivalent (an equivalent being a
20 composition comprising 3.7%wt thioglycolic acid)) into the centre then, using a glass rod, evenly spread the cream around the inside of the o-ring (5). Using tweezers pick up the vitro-skin segment and place the vitro-skin segment, depilatory and o-ring centrally over the receptor cell (2), place donor cell (1) over the top and clamp in place. Turn on stirrer plate and start 10 minute countdown timer. After 10 minutes; turn off stirrer and remove the clamp, donor cell (1) and
25 vitro-skin segment and place the receptor solution in a suitable container for analysis.

5. A reference sample should also be run without protective composition treatment on the vitro-skin. Remove a sheet of vitro-skin from the hydration chamber and lay textured side up on a clean flat surface. Repeat step 4 of the protocol to produce the reference sample.

Sample Analysis

For RP-HPLC analysis, prepare a 50mM Formic acid (98%+ Fluka) solution and mix 970ml of this solution with 30ml acetonitrile (HPLC grade) to act as a mobile phase during the analysis.

A reference standard solution should be made with a concentration of Calcium Thioglycolate

5 Trihydrate of 0.94 mg/ml.

Install a Waters Atlantis T3 3 μ m 4.6 x 50mm column into the HPLC (although any silica- based C₁₈ reversed phase RP-HPLC column may be used), and ensure all solvent lines for the RP-HPLC are primed and free of leaks. Allow the mobile phase to circulate through the system for 25 minutes at 0.7mL/Min in order to equilibrate the column. Detection of the thioglycolic acid is

10 via UV spectroscopy.

The RP-HPLC conditions are as follows:

- Injection volume: 20 μ L
- Mobile phase flow rate: 0.70 ml/min
- Run time: 10 minutes
- 15• UV Detection wavelength: 240 nm
- Column temperature: 35°C
- UV sampling rate: ≥ 5 per second
- Retention time: Thioglycolic Acid ~ 2.5 min

Calculations:

20 Calculate the concentration of Thioglycolic Acid in the sample

$$\text{concentration (mg/ml)} = \frac{\text{weight of std (mg)} \times \text{purity}}{25} \times \frac{3}{25}$$

Calculate the concentration of thioglycolic acid in the sample using the following formula:

$$\text{concentration (mg/ml)} = A/B \times C \times E/F$$

Where,

A = Peak Area of Thioglycolic Acid Sample

B = Average Peak Area of Thioglycolic Acid Standard

5 C = Thioglycolic Acid final STD concentration in mg/ml (0.94 mg/ml)

E = Molecular weight of Thioglycolic acid (92.12g/mol)

F = Molecular weight of Calcium thioglycolate (184.23g/mol)

The efficacy of the barrier provided by the protective composition (resistance to TGA penetration) can be calculated as a percentage decrease in TGA in the receptor solution:

10

$$\% \text{reduction} = \frac{\text{concentration without barrier}^* - \text{concentration with barrier}^*}{\text{concentration without barrier}^*} \times 100$$

*protective composition

15

For example, if TGA in solution without protective composition = 75µg/ml and TGA in solution with barrier = 15 µg/ml

20

$$\% \text{reduction} = \frac{75 - 60}{75} \times 100 = \underline{\underline{85\%}}$$

A reduction of TGA penetration of 45% or more is believed to correlate to a significant and user-noticeable reduction in irritation.

25 Examples

Inventive Example 1

Premix, Oil Phase

	<u>INCI</u>	<u>Trade Name</u>	<u>% w/w</u>
	Sucrose Polycottonseedate*,	Sefa Cottonate	38.160
5	Cera Alba	Beeswax	1.800
	Propyl Paraben	Propyl Paraben	0.040

*oil

10 Main Mixture, Water Phase

	<u>INCI</u>	<u>Trade Name</u>	<u>% w/w</u>
	Purified Water	Deionised Water	59.600
	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	Pemulen TR-2	0.400

15

Making Instructions

- Add all ingredients from Premix into a premix tank (PMT) and heat to 75°C, mixing using an overhead stirrer set to 200rpm. Ensure enough agitation to stop the wax from settling to the bottom of the PMT.
- Once the ingredients within the PMT have reached 75°C, maintain stirring and leave the PMT at 75°C for 45 minutes to ensure that the oil phase has fully melted.
- Cool the PMT to 25°C whilst mixing using the overhead stirrer set to 60rpm. Ensure that aeration of the PMT mixture is avoided.
- Place all ingredients from the Main Mixture into the main mixing tank (MMT).
- Add the mixture from the PMT into the MMT. Using a high shear mixing device (such as a Silverson Laboratory Mixer available from Silverson Machines), mix the contents of the MMT for 5 minutes at ~7000rpm to ensure full emulsification of the phases.
- Transfer product from the MMT to a suitable storage container.

30

The comporsition of Inventive Example 1 was tested using a Franz Cell according to the above-defined method and gave a percentage reduction in thioglycolate penetration of 83%.

The compositions of Inventive Examples 2-6 were made in an analogous fashion to Inventive Example 1. The compositions were then tested using the Franz Cell method defined above.

Example	Protective Composition	%Reduction in Thioglycolic Acid Penetration According to the Franz Cell Method
Inventive Example 2	49.6% Water 47.7% Sefa Cottonate 2.25% Beeswax 0.4% Acrylates/C10-30 Alkyl Acrylate Crosspolymer 0.05% Propyl Paraben	97
Inventive Example 3	29.6% Water 60% Mineral Oil 10% Beeswax 0.4% Acrylates/C10-30 Alkyl Acrylate Crosspolymer	98
Inventive Example 4	39.6% Water 56% Mineral Oil 4% Carnauba 0.4% Acrylates/C10-30 Alkyl Acrylate Crosspolymer	80
Comparative Example 1	76.95% Water 10% Isohexadecane 10% Beeswax 1.75% Polyacrylamide & C13-14 Isoparafin (Sepigel 305) 1% Stearyl Alcohol 0.3% Cetearyl Alcohol & Cetearyl Glucoside	16.0
Comparative Example 2	46.95% Water 30% Isohexadecane 20% Beeswax 1.75% Polyacrylamide & C13-14 Isoparafin (Sepigel 305) 1% Stearyl Alcohol 0.3% Cetearyl Alcohol & Cetearyl Glucoside	15.0
Comparative Example 3	100% mineral oil	25.0
Comparative Example 4	100% Sunflower Seed oil	10.8
Comparative Example 5	100% olive oil	0.0

As demonstrated by the Franz Cell data, oils, on their own (see Comparative Examples 3,4 and 5) and emulsions comprising a hydrophilic continuous phase (and hydrophobic dispersed phase) stabilized by traditional surfactants (see Comparative Examples 1 and 2) provide little to no barrier to prevent thioglycolic acid penetration, whereas the protective compositions comprising emulsions according to the invention (see Inventive Examples 1-4) present a dramatically superior barrier to penetration.

The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm".

Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

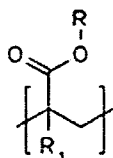
While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

CLAIMS

What is claimed is:

1. A method of removing hair from skin comprising the steps of:
 - (a) applying a protective composition to an area of skin on which unwanted hair is growing, wherein the protective composition comprises a sterically stabilised emulsion comprising a hydrophilic continuous phase, a hydrophobic dispersed phase and a steric emulsifier;
 - (b) applying a depilatory composition to the area of skin to which the protective composition has been applied, the depilatory composition comprising a keratin reducing agent.
2. The method of claim 1, wherein the protective composition comprises from 0.01 % to 5%, preferably from about 0.05% to about 3%, more preferably from 0.05% to 1% of steric emulsifier by weight of the protective composition.
3. The method of claim 1 or 2, wherein the protective composition comprises 15% to 80%, preferably, 20% to 70%, more preferably 25% to 65% hydrophilic continuous phase by weight of the protective composition.
4. The method of any of claims 1 to 3, wherein the protective composition comprises 20% to 85%, preferably, 20% to 75%, more preferably 35% to 70% hydrophobic dispersed phase by weight of the protective composition.
5. The method of any of claims 1 to 4, wherein the hydrophobic dispersed phase comprises wax.
6. The method of claim 5, wherein the protective composition comprises 0.75% to 15%, preferably 1% to 10%, more preferably 1% to 8% wax by weight of the protective composition.
7. The method of claim 5 or 6, wherein the wax comprises natural wax, synthetic wax, silicone wax, or mixtures thereof.

8. The method of any preceding claim, wherein the hydrophobic continuous phase comprises silicone oil, preferably dimethicone having a viscosity of 1 to 10,000 centistoke, preferably 5 to 1000 centistoke, more preferably 25 to 500 centistoke.
9. The method of any preceding claim, wherein the protective composition comprises from 0.01% to 5%, preferably from 0.05% to 3% and more preferably from 0.05% to 1% of steric emulsifier.
10. The method of any preceding claim, wherein the steric emulsifier comprises a carboxylic copolymer comprising a monomeric mixture, the monomers being selected from the group consisting of acrylic acid, methacrylic acid and ethacrylic acid; 1% to 3.5% by weight of the carboxylic acid copolymer of an acrylate ester of the formula:



wherein R_1 is hydrogen, methyl or ethyl and R is an alkyl radical containing 10 to 30 carbon atoms; 95.9% to 98.8% by weight of the carboxylic acid copolymer of an acrylate ester where R_1 and R are hydrogen, methyl or ethyl and 0.1 to 0.6%, preferably 0.2 to 0.4% by weight of the carboxylic acid copolymer, of a polymerizable cross-linking polyalkenyl polyether of a polyhydric alcohol containing more than one alkenyl ether group per molecule, wherein the parent polyhydric alcohol contains at least 3 carbon atoms and at least 3 hydroxyl groups.

11. The method of any of preceding claim, comprising the following additional step between step (a) and step (b):

(a1) massaging the protective composition into the skin for at least 10 seconds.

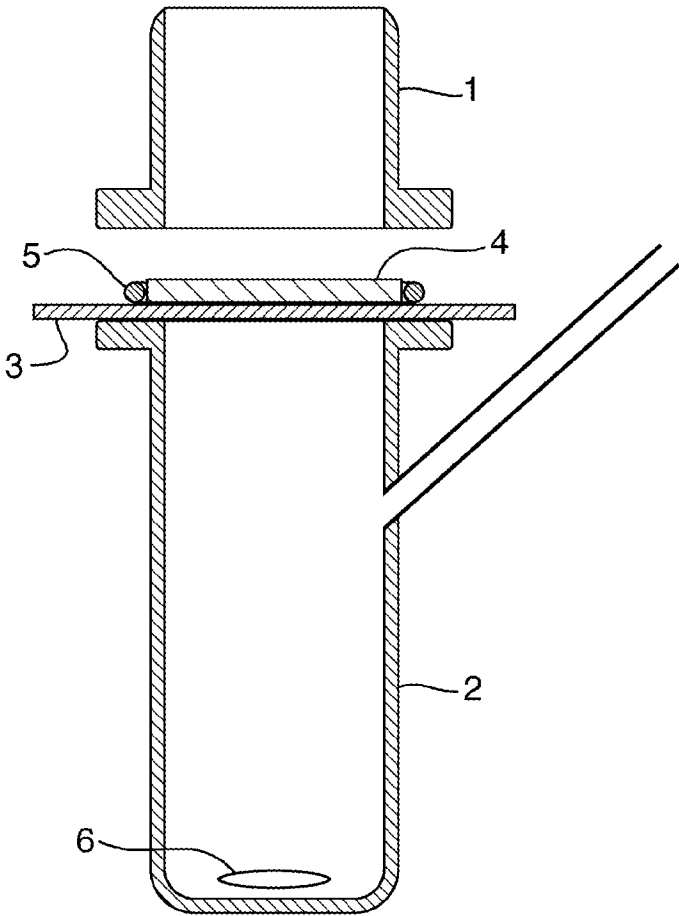
12. The method of any preceding claim, wherein the keratin reducing agent comprises a thioglycolate salt, preferably potassium or calcium thioglycolate, or mixtures thereof.

13. A depilatory kit comprising:

- (a) a protective composition comprising a sterically stabilised emulsion comprising a hydrophilic continuous phase, a hydrophobic dispersed phase and a steric emulsifier;

- (b) a depilatory composition comprising an effective amount of a keratin reducing agent.
14. The depilatory kit of claim 13, additionally comprising a tool, such as a scraper or a spatula, or a wipe.
15. The depilatory kit of claim 13 or 14, additionally comprising the following instructions:
- (a) An instruction to apply the protective composition over an area of skin to be depilated, preferably an instruction to apply the protective composition over an area which is greater than the area of skin to be depilated;
 - (b) Optionally an instruction to massage the protective composition into the area of skin to be depilated, preferably for at least 10 seconds, more preferably to massage in a circular motion;
 - (c) An instruction to apply the depilatory composition to the pre-treated area of skin to be depilated;
 - (d) Optionally, an instruction to leave the depilatory composition in place on top of the protective composition for a period of at least 1 minute, preferably from 1 to 10 minutes, more preferably from 3 to 10 minutes;
 - (e) Optionally an instruction to remove both the protective composition and the depilatory composition from the skin, by scraping, wiping or rubbing it off.
 - (f) Optionally an instruction to treat the area of skin which has been depilated with a post-treatment skin care composition.

Fig.1.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/033988

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K8/06 A61Q9/04 A61Q17/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K A61Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/219118 A1 (SLAVTCHEFF CRAIG STEPHEN [US] ET AL) 4 November 2004 (2004-11-04) claims 1-10 paragraph [0005] - paragraph [0024] -----	1-15
Y	GB 2 327 190 A (RECKITT & COLMAN FRANCE [FR] RECKITT & COLMAN FRANCE [FR]; RECKITT BEN) 20 January 1999 (1999-01-20) claims 1-26 page 8, line 28 - page 9, line 22 -----	1-15
Y	WO 2006/021782 A1 (RECKITT & BENCKISER UK LTD [GB]; MOUSSOUNI FARID [GB] RECKITT BENCKISE) 2 March 2006 (2006-03-02) claims 1-13 -----	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

18 May 2012

Date of mailing of the international search report

31/05/2012

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Briand, Benoit

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/033988

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004219118	A1	04-11-2004	NONE

GB 2327190	A	20-01-1999	AU 755351 B2 12-12-2002
			AU 8122998 A 08-02-1999
			BR 9810552 A 15-08-2000
			CA 2296443 A1 21-01-1999
			DE 69812365 D1 24-04-2003
			DE 69812365 T2 04-12-2003
			ES 2195357 T3 01-12-2003
			GB 2327190 A 20-01-1999
			MX PA00000247 A 03-12-2004
			US 6306380 B1 23-10-2001
			WO 9902125 A1 21-01-1999

WO 2006021782	A1	02-03-2006	AT 432020 T 15-06-2009
			AT 489934 T 15-12-2010
			AU 2005276210 A1 02-03-2006
			BR PI0514659 A 24-06-2008
			CA 2577775 A1 02-03-2006
			CN 101005878 A 25-07-2007
			EP 1799177 A1 27-06-2007
			ES 2327689 T3 02-11-2009
			ES 2356746 T3 12-04-2011
			GB 2417899 A 15-03-2006
			JP 2008510782 A 10-04-2008
			US 2008213205 A1 04-09-2008
			WO 2006021782 A1 02-03-2006
			ZA 200701310 A 31-12-2008
