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[54] **COMPOSITION AND PROCESS FOR LUBRICATING THE SKIN**

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[58] **Field of Search** 424/358, 70, 73, 63, 64, 424/168, 170, 171, 172, 355

[56] **References Cited**

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Wells et al., Cos. & The Skin, Reinhold Pub. N.Y., 1964, pp. 654–654.

DeNavarre, The Chem. & Mfg. of Cos., 2nd ed, Vol. II, pp. 359–367.

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[57] **ABSTRACT**

C_{12}–C_{14} isoparaffinic hydrocarbon fractions are effective skin lubricants and cosmetic formulation constituents. The paraffinic oils possess a unique combination of properties, namely, low viscosity, moderate volatility, plus the ability to disperse dyes and/or pigments. Typically, the isoparaffinic hydrocarbon fraction makes up less than 50 weight % of the total cosmetic formulation and are normally admixed with water, monoalkanols, alkyl and aryl esters, humectant compositions, surfactants, lanolin, white oils, pigments, dyes, clays, perfumes and mixtures thereof.

2 Claims, No Drawings

COMPOSITION AND PROCESS FOR LUBRICATING THE SKIN

BACKGROUND OF THE INVENTION

I. Field of the Invention

This invention relates to cosmetic formulations and a method for the beneficiation of the human body, in particular the hair, nails and skin of the cosmetic user. More particularly, the invention relates to cosmetic formulations comprising an effective amount of a C_{12}–C_{14} isoparaffinic hydrocarbon fraction and to a process for using the same.

II. Description of the Prior Art

Various types of hydrocarbon materials have been employed as constituents in cosmetic formulations. The most commonly employed hydrocarbon materials are the relatively high molecular weight, high boiling, white mineral oils and petrolatums (see "Cosmetics and The Skin" by Wells and Labowe, pp. 654–657 and "The Chemistry and Manufacture of Cosmetics", by Maison G. DeNavarre, Volume II, second Edition, pp. 359–367). Mineral oils and petrolatum are used in cosmetic products primarily because of their neutral, stable, and odorless character. These compositions are heavy, viscous materials that are substantially nonvolatile at atmospheric conditions and which do not serve as dispersion media for dyes or pigments in cosmetic preparations. The use of lower molecular weight, more volatile hydrocarbon materials has also been reported in the literature. Specifically, Kambersky in U.S. Pat. No. 3,211,618 reported that paraffins, in particular isoparaffins (branched hydrocarbons) having a boiling range between 160°–200°C., could be used as a volatile constituent for eyelash and eyebrow cosmetics. Also in U.S. Pat. No. 2,439,088, the use of a hydrocarbon solvent for cosmetic preparations is disclosed, specifically C_{11} to C_{13} isoparaffins having a boiling range of 183° to 222°C. are taught as useful in combination with cosmetic powders and waxes.

Such materials, because of their very high volatility, give relatively little "duration of feel" and cosmetic materials prepared containing the same, quickly lose effectiveness, as the hydrocarbon constituents evaporate within a few minutes after application.

SUMMARY OF THE INVENTION

In accordance with the present invention, it has been found that C_{12}–C_{14} isoparaffinic fractions composed of branched chain aliphatic and naphthenic materials are highly effective constituents for a wide spectrum of cosmetic formulations and topical pharmaceuticals. The preferred paraffin materials are composed of a major amount, i.e., more than 50 weight % of branched, noncyclic, nonsubstituted, aliphatic hydrocarbons having from 12 to 14 carbon atoms and a minor amount, i.e., up to 50 weight % of alicyclic, nonsubstituted, naphthenic hydrocarbons. The C_{12}–C_{14} isoparaffinic hydrocarbon fractions are colorless, essentially odorless compositions that possess low viscosity and moderate evaporation properties. The unique combination of volatility and viscosity of these materials permits the skin to be lubricated by a quick spreading, nongreasy oil that evaporates after use and thereby does not permit residual oil buildup. Typically, cosmetic formulations contain less than about 50 wt. % of the C_{12}–C_{14} isoparaffinic hydrocarbon fraction and are normally employed in combination with various types of typical cosmetic ingredients.

The isoparaffinic hydrocarbon fractions employed in this invention are obtained by distillation of suitable fractions of motor fuel alkylation bottoms. The C_{12}–C_{14} fraction boiling between about 225° to 255°C. are then purified to cosmetic grade quality.

As noted earlier, usable hydrocarbon fractions are C_{12}–C_{14} isoparaffinic hydrocarbon fractions. The expression "C_{12}–C_{14} isoparaffinic hydrocarbon fraction" as used herein is meant to encompass hydrocarbon compositions composed of a major amount, i.e., greater than 50%, preferably from about 70 to 90%, most preferably from about 70 to 80% of branched chain, noncyclic, nonsubstituted aliphatic hydrocarbons having from 12 to 14 carbon atoms and a minor amount of alicyclic nonsubstituted, napthenic hydrocarbons. The useful hydrocarbon materials have a distillation range (atmospheric boiling points) varying from about 225° to 225°C. as determined by ASTM Method D 86. The properties of a typical C_{12}–C_{14} isoparaffinic hydrocarbon fraction are as follows: Specific gravity at 20/20°C. of 0.788 as determined by ASTM Method D 1217; a kinematic viscosity of 4.6 centistokes at 20°C. as determined by ASTM Method D 445; a SSU viscosity at 100°F. of about 36; a refractive index (n_D^{20}) of 1.439 as determined by ASTM Method D 1218; a flash point of 190°F. (COC) as determined by ASTM Method D 56; a pour point of <−76°F. as determined by ASTM Method D 97; a surface tension of about 25.0 dynes/centimeter at 25°C; and an interfacial tension (on water) of about 53.0 dynes/centimeter at 25°C.

The isoparaffinic hydrocarbon is used in admixture with one or more additional ingredients to arrive at a final cosmetic formulation. Typically, the isoparaffinic hydrocarbon is used in cosmetic formulations in amounts less than about 50 wt. %, generally from 0.5 to 50 wt. %, based on total formulation. The amount of isoparaffinic hydrocarbon employed depends primarily upon the cosmetic type. For example, the isoparaffinic oil may make up only about 5 wt. % of liquid make-up compositions whereas concentrations approaching 50 wt. % of the isoparaffinic hydrocarbon may be used in spreading bath oils.

The isoparaffinic hydrocarbon is used in cosmetic formulations in admixture with one or more of the following substituents:

1. Water;
2. C_2–C_4 monoalkanols, e.g., ethanol, isopropanol, butanol, etc.;
3. Organic ester dispersion media, e.g., C_8–C_{26} aliphatic and aromatic acid esters of C_2–C_6 monoalkanols, for example, diisopropyl adipate, isopropyl myristate, butyl stearate, etc.;
4. Humectant compositions, in particular polyhydroxy compounds such as dipropylene glycol, glycerol, polyethylene gylcol, propylene glycol, sorbitan, butanediol, etc.;
5. Lanolin;
6. Clay minerals and inorganic silicates, for example, kaolin, bentonite, zeolite, talc, Fullers earth, diatomaceous eath, zinc silicate, lithium silicate, etc.;
7. Dyes and metal oxide pigments such as titanium dioxide, zinc oxide, iron oxide, etc.;
8. Surfactant compositions, e.g., (a) sulfonated and sulfated oils such as sulfonated normal glycerides,

sulfated fatty alcohol ethoxylates, sulfated glycol monoesters, sulfonated methyl, ethyl and butyl fatty acid esters, etc.; (b) alkylaryl sulfonates, such as dodecyl benzene sulfonates; (c) ammonium, calcium, magnesium, potassium, sodium, zinc and alkanol amine derivatives of sulfated C_{12}–C_{14} alcohols such as sodium myristyl sufate, sodium lauryl sulfate, etc.; (d) quaternary ammonium compounds such as lauryl- and stearyl-dimethylbenzyl ammonium chloride; (e) alkoxylated, in particular, ethoxylated higher fatty alcohols, higher fatty acids, fatty esters, alkylphenols, etc.;

9. Animal, vegetable and hydrocarbon waxes such as beeswax, carnauba, jojoba, paraffin wax, microcrystalline hydrocarbon wax, etc.;
10. White oils and petrolatum; and
11. Perfume and fragrance materials.

The isoparaffinic hydrocarbon materials, can of course be used in cosmetic formulations that contain materials other than those specified above. The above listing is intended to indicate that the subject C_{12}–C_{14} isoparaffinic materials can be used in a wide range of cosmetic formulations. For example, the hydrocarbon materials can be used in face make-up, body make-up, eye shadow, mascara, hair coloring, dyeing preparations, lip rouge, cheek rouge, masking preparations, eyebrow preparations, eyeliner, hand cleaners, bath oils, as well as other types of oil and water emulsions, water-in-oil emulsions, alcoholic emulsions, wax and oil mixtures, soaps, wax mixtures, oil mixtures, etc. As mentioned earlier, the hydrocarbon materials are highly effective dispersant media for the pigment and dye materials normally employed in cosmetic formulations. Hence, the C_{12}–C_{14} isoparaffin hydrocarbon materials can be used in the place of typical ester dispersion media (Item (3) above) thereby permitting the formulation of make-up type materials without using the ester dispersion compositions.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The utility of the isoparaffinic hydrocarbon materials as cosmetic ingredients is shown in the following formulations:

EXAMPLE 1

A pre-electric shave lotion was prepared by admixing the following ingredients:

Formula	Weight %
C_{12}–C_{14} isoparaffinic fraction	17.0
Ethanol	79.7
Perfume Oil	0.3
Hexadecyl Alcohol (Branched chain)	3.0

EXAMPLE 2

A cationic hair conditioner was prepared from the following materials:

Part A	Weight %
C_{12}–C_{14} isoparaffin fraction	15.0
Hexadecyl Alcohol (Branched chain)	5.0
Glycerol Monostearate	5.0
Stearyl Alcohol	5.0
Polyoxyethylene (20) Oleyl Ether	2.5
Dialkylaminoalkyl Palmitamide	1.0
Propyl-P-Hydroxybenzoate	0.1
Part B	**Weight %**
Water, Deionized	60.6
Propylene Glycol, USP	5.0
Methyl-P-Hydroxybenzoate	0.2
Phosphoric Acid (85 wt. %)	0.2
Part C	**Weight %**
Perfume oil	0.4

The conditioner was formulated by heating Part A to 70°–75°C. and Part B to 65°–70°C. and then admixing the same with stirring. The resulting emulsion is then permitted to cool to 25°–50°C. with stirring. Thereafter, Part C is added to the mixture to secure the final formulation.

EXAMPLE 3

A hair groom and conditioner was prepared from the following materials:

Part A	Weight
C_{12}–C_{14} isoparaffin fraction	19.6
Mineral oil (185 SSU viscosity at 100°F.)	4.9
Lanolin (anhydrous)	1.9
Ethoxylated Lanolin	1.9
Sorbitan monooleate	2.6
Polyoxyethylene (20) sorbitan monooleate	5.3
Polyethoxylated beeswax	3.9
Polyethylene glycol (M.W. 2000)	4.8
Propyl-p-Hydroxybenzoate	0.2
Part B	**Weight %**
Water, deionized	42.3
Part C	**Weight %**
Carbopol 960 (Carboxy vinyl polymer)	0.4
Part D	**Weight %**
Propylene glycol	1.9
Polyoxyethylene (12) lauryl ether	9.8
Methyl-p-hydroxybenzoate	0.2
Part E	**Weight %**
Perfume Oil	0.03

The product was prepared by first mixing Part B and Part C with stirring and then Part D with the initial B-C mixture. The B-C-D mixture is then heated 70°–75°C. with stirring. Thereafter Part A is heated to 75°–80°C. with stirring and mixed with the B-C-D mixture. The A-B-C-D mixture is then cooled with stirring to 40°–45°C. and then mixed with Part E. The final product is then permitted to cool to 25°–30°C. with stirring and the mixture packaged.

EXAMPLE 4

An anhydrous rouge composition was prepared from the following constituents:

Part A	Weight %
C_{12}–C_{14} isoparaffin fraction	35.5
Mineral oil (90 SSU viscosity at 100°F.)	15.0
Microcrystalline wax	10.0
Carnauba wax	6.0
Part B	**Weight %**
Talc	10.0
Titanium Dioxide	20.0
Pigment	3.0
Propyl-p-hydroxybenzoate	0.15
Part C	**Weight %**
Perfume Oil	0.5

The rouge is obtained by pre-blending Part B and then stirring the same with Part A which had been previously heated to 80°–85°C. The mixing is desirably conducted in a roller mill. After the mixing operation, the A-B mixture is heated to 70°–75°C. with stirring and then admixed with Part C.

EXAMPLE 5

A waterless hand cleaner composition was prepared from the following materials:

Part A	Weight %
C_{12}–C_{14} isoparaffin fraction	34.5
Oleic acid	10.6
Nonylphenol (10) ethoxylate	4.3
Antioxidant	0.1
Propyl-p-hydroxybenzoate	0.1
Part B	**Weight %**
Water, deionized	41.7
Propylene Glycol	4.3
Triethanolamine	1.1
Monoethanolamine	2.6
Methyl-p-hydroxybenzoate	0.2
Part C	**Weight %**
Perfume Oil	0.5

Part A is heated to 75°–80°C. and then Part B heated to 85°–90°C. Parts A and B are then mixed with stirring and the mixture cooled to 80–85°C. The A-B mixture is then admixed with Part C to obtain the final product.

EXAMPLE 6

A pre-electric shave lotion was prepared in the manner described in Example 1 except that in place of the C_{12}–C_{14} isoparaffin fraction of the present invention, having a volatility in the range of about 225° to 255°C. a C_{11}–C_{13} isoparaffin solvent having a volatility in the range of about 180° to 220° was employed.

EXAMPLE 7

The pre-electric shave lotions prepared in Example 1 and Example 6 were tested by human subjects who applied each to their face and then shaved.

The responses to the use of each lotion were as follows. The pre-shave lotion of Example 6 proved ineffective since it evaporated from the skin too rapidly to allow for proper lubrication and additionally caused an overall drying effect on the skin. The lotion prepared in accordance with Example 1 was highly effective in providing sufficient skin lubrication and a comfortable "after-shave" effect.

What is claimed is:

1. A cosmetic composition for lubricating the skin comprising an admixture of cosmetic conditioning materials in an oil and water emulsion including 0.5 to 50 weight percent, based on the total composition, of a lubricant C_{12}–C_{14} isoparaffinic hydrocarbon fraction boiling in the range of about 225° to 225°C.

2. A process for lubricating the skin which comprises applying to the skin a cosmetic formulation comprising an admixture of cosmetic materials and a lubricating effective amount of from 0.5 to 50 weight percent based on total formulation of a C_{12}–C_{14} isoparaffinic hydrocarbon fraction boiling in the range of about 225° to 255°C.

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