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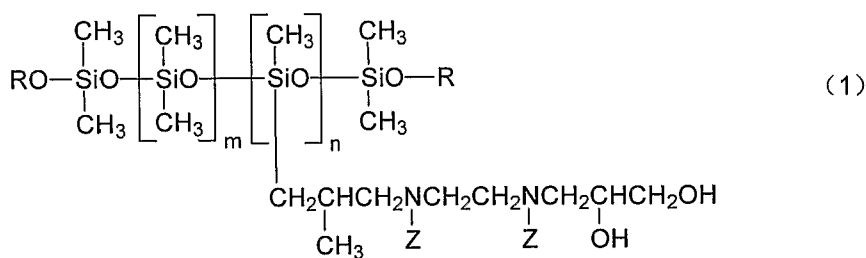
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(54) Title: HAIR COSMETIC COMPOSITION



(57) Abstract: A hair cosmetic composition containing, (a) any one or more of the compounds represented by the following formula (I), 0.1~2.0 wt%, (b) ester oil, 0.1~3.0 wt%, (c) cationic surfactant, 1~7 wt%, and (d) fatty alcohol, 4~15 wt%, wherein the ratio (b)/(a) by weight is 0.05~30. (Wherein, R represents any one or more of hydrocarbon groups from C₁₃H₂₇ to C₁₅H₃₁, and 75% of Z represents a group-CH₂CH(OH)CH₂OH and the remaining portion represents a hydrogen atom, m is 25 to 1000, n is 0.1 to 200.)

Hair Cosmetic Composition

Field of the Invention

The present invention relates to silicone containing hair cosmetic compositions, particularly amino-functional silicone containing hair cosmetic compositions, which can improve smoothness and the feeling of softness of the hair.

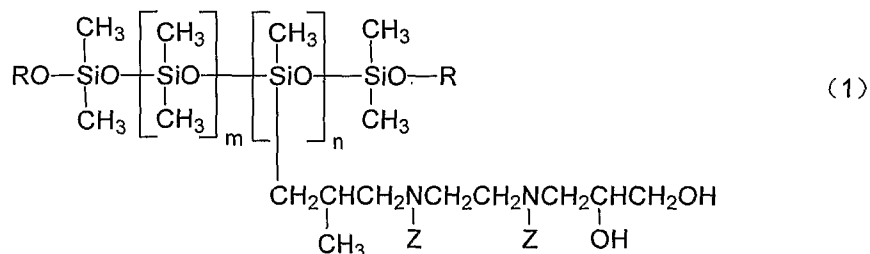
Background of the Invention

The use of silicones as conditioning agents in cosmetic formulations is well known and widely documented in the patent literature. Hair cosmetic compositions containing amino-functional silicone have also been described in several publications. For example, a hair detergent composition containing an anionic surfactant, a specific glyceryl ether, and a silicone derivative having a side chain with both a hydroxyl group and a nitrogen atom has been disclosed in WO 2004/014334. Also, a hair conditioning composition containing a particular class of amino-functional silicone has been disclosed in WO 99/49836.

Problems existing in the prior art are that generally used silicones do not show good compatibility in a hair conditioner or hair treatment, and that the conditioning effects of the amino-functional silicones in cosmetic compositions in the above mentioned patent applications are not sufficient.

Summary of the Invention

The present invention provides a hair cosmetic composition containing, (a) any one or more of the compounds represented by the following formula (1), 0.1~2.0wt.%,



(wherein, R represents any one or more of hydrocarbon groups from C₁₃H₂₇ to C₁₅H₃₁, and 75% of Z represents a group —CH₂CH(OH)CH₂OH and the remaining portion represents a hydrogen atom, m is 25 to 1000, and n is 0.1 to 200);

(b) ester oil, 0.1~3.0wt.%; (c) cationic surfactant, 1~7wt.%; (d) fatty alcohol, 4~15wt.%; wherein the ratio (b)/(a) by weight is 0.05~30.

The present invention also provides a method for producing the hair cosmetic composition of the invention, having the following steps in the following sequence: (1) mixing (b) ester oil, (c) cationic surfactant and (d) fatty alcohol, (2) adding (f) silicone which is not amino-functional

silicone to the mixture obtained after said step (1), (3) adding said Component (a) to the mixture obtained after said step (2).

The present invention also provides a method for producing the hair cosmetic composition of the invention, having the following steps in the following sequence: (1) mixing (c) cationic surfactant and (d) fatty alcohol, (2) adding said Component (a) and (b) ester oil to the mixture obtained after said step (1), (3) adding (f) silicone which is not amino-functional silicone to the mixture obtained after said step (2).

The present invention also provides a hair conditioner containing the hair cosmetic composition of the invention.

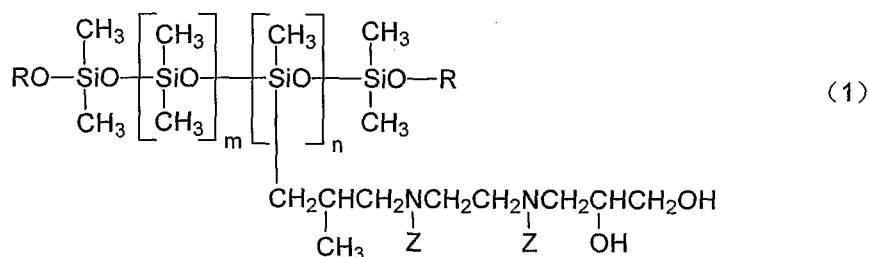
The present invention also provides a hair treatment containing the hair cosmetic composition of the invention.

Detailed Description of the Invention

The present invention relates to hair cosmetic compositions providing improved smoothness and a feeling of softness to the hair during rinsing and after the drying process, and good damage-care effect to the hair.

The present inventors have found that a hair cosmetic composition satisfying the above-described demand can be realized by using in combination a specific type of amino-functional silicone and ester oil under a specific weight ratio therebetween.

The hair cosmetic composition of the present invention contains as Component (a) any one or more of the compounds represented by the following formula (1),



(wherein, R represents any one or more of hydrocarbon groups from C₁₃H₂₇ to C₁₅H₃₁, and 75% of Z represents a group —CH₂CH(OH)CH₂OH and the remaining portion represents a hydrogen atom, m is 25 to 1000, and n is 0.1 to 200).

A preferred example of Component (a) is any one or more of the compounds represented by the formula (1) in which m=68 and n=2, and its commercially available product which is, for example, "8500 Conditioning Agent" (CAS No. 237753-63-8) of Dow Corning with an INCI Name of 'BIS(C13-15 ALKOXY) PG AMODIMETHICONE'.

As Component (a), two or more of these compounds may be used in combination and the amount thereof is from 0.1 to 2.0 wt.% in the cosmetic composition of the present invention. From the viewpoints of good compatibility with Component (b), the smoothness and softness of the hair during rinsing, smoothness and softness after drying, the amount is preferably from 0.3 to 1.0

wt.%.

The hair cosmetic composition of the present invention contains as Component (b) ester oil. Examples of Component (b) include isopropyl palmitate, isopropyl myristate, octyldodecyl myristate, hexyl laurate, cetyl lactate, propylene glycol monostearate, oleyl oleate, hexadecyl 2-ethylhexanoate, isononyl isononanoate, and tridecyl isononanoate. Among them, from the viewpoints of good compatibility with Component (a) and of increasing smoothness and feeling of softness of the hair, isopropyl palmitate is preferable.

As Component (b), two or more of the above mentioned compounds may be used in combination and the amount thereof is from 0.1 to 3.0 wt.% in the cosmetic composition of the present invention. From the viewpoints of good compatibility with Component (a), the smoothness and softness of the hair during rinsing, and smoothness and softness after drying, it is preferably from 0.5 to 1.5 wt.%.

From the viewpoints of good compatibility between Component (a) and Component (b), and of the smoothness and softness of the hair during rinsing, smoothness and softness after drying, the ratio (b)/(a) by weight is from 0.05 to 30, and preferably from 0.5 to 5.0.

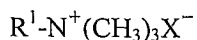
The mechanism which can explain the improvement of the smoothness and softness of the hair by using in combination the above mentioned Component (a) and Component (b) under a specific weight ratio has not been made quite clear yet. However although not wanting to be limited by theory, it is supposed as follows. In the hair cosmetic composition, silicones which are not amino-functional silicone are usually not dissolved in ester oil and do not show good compatibility therebetween. But amino-functional silicones such as Component (a) of the present invention are dissolved in ester oils under a specific weight ratio therebetween in the hair cosmetic composition, and are considered to exist in the lamellar formed by cationic surfactant and fatty alcohol in the inner structure of a conditioner. In contrast, silicones which are not amino-functional silicone do not exist in the lamellar. Thus, amino-functional silicones tend to remain more on the hair during rinsing and after the drying process, by which the smoothness and softness of the hair are improved.

The hair cosmetic composition of the present invention contains as Component (c) a cationic surfactant. Examples of Component (c) include quaternary ammonium salt type cationic surfactants.

Examples of the quaternary ammonium salt type cationic surfactant include the following compounds (i) to (vi).

(i) Alkyltrimethylammonium salts

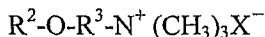
Usable are, for example, compounds represented by the following formula:



(wherein, R^1 represents a C_{12-22} alkyl group and X^- represents a halide ion (chloride ion or bromide ion) or an alkyl sulfate ion having 1 or 2 carbon atoms).

(ii) Alkoxytrimethylammonium salts

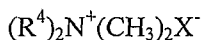
Usable are, for example, compounds represented by the following formula:



(wherein, R^2 represents a C_{12-22} alkyl group and R^3 represents an ethylene or propylene group and X^- has the same meaning as described above).

5 (iii) Dialkyldimethylammonium salts

Usable are, for example, those represented by the following formula:



(wherein, R^4 represents an alkyl having from 12 to 22 carbon atoms or benzyl group and X^- has the same meaning as described above).

10 (iv) Alkyldimethylamines (and Salts Thereof)

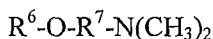
Usable are, for example, those represented by the following formula:



(wherein, R^5 has the same meaning as described above) and salts thereof.

(v) Alkoxydimethylamines (and Salts Thereof)

15 Usable are, for example, those represented by the following formula:



(wherein, R^6 and R^7 has the same meanings as described above) and salts thereof.

(vi) Alkylamidodimethylamines (and Salts Thereof)

Usable are, for example, those represented by the following formula:

20 $R^8-C(=O)NH-R^9-N(CH_3)_2$

(wherein, R^8 represents an alkyl group having from 11 to 21 carbon atoms and R^9 has the same meaning as described above) and salts thereof.

Examples of the cationic surfactants other than those described above in (i) to (vi) include lanolin fatty acid aminopropylethyldimethylammonium ethyl sulfate (ethyl sulfate salt of alkanoyl
 25 aminopropyldimethylethylammonium, the alkanoyl group is derived from lanolin), lanolin fatty acid aminoethyltriethylammonium ethyl sulfate, lanolin fatty acid aminopropyltriethylammonium ethyl sulfate, lanolin fatty acid aminoethyltrimethylammonium methyl sulfate, lanolin fatty acid aminopropylethyldimethylammonium methyl sulfate, isoalkanoic acid ($C_{14}-C_{20}$) aminopropylethyldimethylammonium ethyl sulfate, isoalkanoic acid ($C_{18}-C_{22}$)
 30 aminopropylethyldimethylammonium ethyl sulfate, isostearic acid aminopropylethyldimethylammonium ethyl sulfate, isononanoic acid aminopropylethyldimethylammonium ethyl sulfate, and alkyltrimethylammonium saccharins.

The smoothness and feeling of softness can be further increased by adding the cationic surfactant. From this viewpoint, among the examples of Component (c) above mentioned,
 35 stearyxpropyl dimethylamine, stearamidopropyl dimethylamine, cetrimonium chloride, and steartrimonium chloride are preferred.

As Component (c), two or more of the above mentioned compounds may be used in combination and the amount thereof is from 1 to 7 wt.% in the cosmetic composition of the

present invention. From the viewpoints of increasing smoothness and softness of the hair during rinsing, smoothness and softness after drying, it is preferably from 2 to 5 wt.%.

The hair cosmetic composition of the present invention contains Component (d) fatty alcohol. The combined use of fatty alcohol materials and cationic surfactants in hair cosmetic compositions is believed to be especially advantageous, because this leads to the formation of a lamellar phase, in which the cationic surfactant is dispersed.

Representative fatty alcohols have from 14 to 22 carbon atoms, more preferably from 16 to 22. Examples of suitable fatty alcohols include myristyl alcohol, cetearyl alcohol, cetyl alcohol, stearyl alcohol, behenyl alcohol and the like. Preferable examples are cetearyl alcohol, stearyl alcohol and cetyl alcohol.

As Component (d), two or more of the above mentioned compounds may be used in combination and the amount thereof is from 4 to 15 wt.%, preferably 5 to 10 wt.%, in the cosmetic composition of the present invention.

Optionally, the hair cosmetic composition of the present invention may also contain a Component (e) nonionic polymer. Nonionic polymers useful herein include cellulose derivatives, hydrophobically modified cellulose derivatives, ethylene oxide polymers, and ethylene oxide/propylene oxide based polymers. Suitable nonionic polymers are cellulose derivatives including methylcellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, cetyl hydroxyethyl cellulose. Other suitable nonionic polymers are guar gum and the like.

Optionally, the hair cosmetic composition of the present invention may also contain a Component (f) silicone which is not amino-functional silicone.

Examples of the silicone which is not amino-functional silicone include dimethylpolysiloxanes, polyether modified silicones, methylphenylpolysiloxane, fatty acid modified silicones, alcohol modified silicones, alkoxy modified silicones, epoxy modified silicones, fluorine modified silicones, cyclic silicones and alkyl modified silicones.

Two or more of these silicones may be used in combination. The amount of the silicones in the hair cosmetic composition of the present invention is preferably from 0.1 to 10 wt. %, more preferably from 0.3 to 3 wt. % from the viewpoints of increasing smoothness and feeling of softness of the hair during rinsing and after drying.

The hair cosmetic composition of the present invention may further contain, according to the purpose of use, components ordinarily employed for hair cosmetic compositions. Examples include pH adjusters such as lactic acid and malic acid; viscosity modifiers; polyols such as glycerine and polypropylene glycol; nonionic surfactants such as polyoxyethylene alkyl ethers, polyoxyethylene sorbitan fatty acid esters, glycerin fatty acid esters, polyglycerin fatty acid esters, polyoxyethylene hydrogenated castor oils, sucrose fatty acid esters, polyglycerin alkyl ethers, fatty acid alkanolamides, and alkyl glycosides; vitamin preparations; bactericides; anti-inflammatory agents; antiseptics; chelating agents; humectants such as panthenol; colorants such as dyes and pigments; extracts such as extract of Eucalyptus in a polar solvent, protein available from a pearl

or a shell having a pear layer or hydrolysate of the protein, protein available from silk or hydrolysate of the protein, protein-containing extract available from seeds of legume plants, Panax ginseng extract, rice bran extract, fucoid extract, camellia extract, aloe extract, Alpinia Leaf extract and chlorella extract; pearl powder such as mica titanium; essence; fragrance; coloring matters; ultraviolet absorbers; antioxidants; hair care adjuvants such as amino acids, ceramides and fatty acids.

The hair cosmetic composition of the present invention may be a hair detergent composition, a hair conditioning composition or a hair treatment composition, while it is preferable to be a hair conditioning composition or a hair treatment composition.

The hair cosmetic composition of the present invention can be applied in hair shampoo, hair rinse, hair conditioner, hair treatment and the like, while it is preferred to apply it in a hair conditioner and hair treatment.

The preparation methods of the hair cosmetic composition according to the present invention include the following four methods.

The first preparation method has the following steps in the following sequence: (1) mixing (c) cationic surfactant and (d) fatty alcohol in water, (2) adding the above mentioned Component (a) compounds represented by the formula (1) and (b) ester oil to the mixture obtained after the step (1), (3) adding (f) silicone which is not amino-functional silicone to the mixture obtained after the step (2).

By using the hair cosmetic composition prepared by the first preparation method, the smoothness and feeling of softness of the hair during rinsing and after drying can be improved. In addition, the hair cosmetic composition prepared by the first preparation method can provide a damage-care effect with a light feeling to the touch which is especially suitable for less damaged hair.

The second preparation method for producing the hair cosmetic composition of the present invention has the following steps in the following sequence: (1) mixing (c) cationic surfactant, (d) fatty alcohol and (a) compounds represented by the formula (1) in water, (2) adding (b) ester oil to the mixture obtained after the step (1), (3) adding (f) silicone which is not an amino-functional silicone to the mixture obtained after the step (2).

The third preparation method for producing the hair cosmetic composition of the present invention has the following steps in the following sequence: (1) mixing (a) any compound represented by the formula (1), (b) ester oil, (c) cationic surfactant and (d) fatty alcohol in water, (2) adding (f) silicone which is not amino-functional silicone to the mixture obtained after the step (1).

The fourth preparation method for producing the hair cosmetic composition of the present invention has the following steps in the following sequence: (1) mixing (b) ester oil, (c) cationic surfactant and (d) fatty alcohol in water, (2) adding (f) silicone which is not an amino-functional silicone to the mixture obtained after the step (1), (3) adding (a) any compound represented by the

formula (1) to the mixture obtained after the step (2).

By using the hair cosmetic composition prepared by the fourth preparation method, the smoothness and feeling of softness of the hair during rinsing and after drying can be improved. In addition, the hair cosmetic composition prepared by the fourth preparation method can provide a damage-care effect with a heavier feeling to the touch which is especially suitable for much damaged hair.

Among the four preparation methods, the first and the fourth preparation methods are preferably effective to prepare hair cosmetics with a more excellent light/smooth and heavy/coated feeling to damaged hair.

With the hair cosmetic composition, the producing method thereof, the hair conditioner and the hair treatment provided by the present invention, the smoothness and feeling of softness of the hair during rinsing and after drying can be improved, and good damage-care effect to the hair can be provided.

The following examples further describe and demonstrate embodiments of the present invention. The examples are given solely for the purpose of illustration and are not to be construed as limitation of the present invention.

Examples

Hair conditioners having the composition as shown in Tables 1 to 9 were prepared, and their "smoothness", "softness" and "damage-care effect" were evaluated by the below-described method and criteria. The evaluation results are shown in Table 10.

Preparation examples

Examples 1 to 4 and Comparative Examples 1 to 3 were prepared by the following steps (corresponding to the above mentioned fourth preparation method).

First, isopropyl palmitate (as (b) ester oil), stearoxypropyl dimethylamine (as (c) cationic surfactant) and stearyl alcohol (as (d) fatty alcohol) with their amounts shown respectively in Tables 1-4,6-8 were added into water at 55~60°C. Then in the mixture thus obtained, dimethicone (as (f) silicone which is not an amino-functional silicone) with the amounts shown respectively in Tables 1-4,6-8 was added. After that, Bis(C13-15 Alkoxy)PG Amodimethicone (as (a)) with the amounts shown respectively in Tables 1-4,6-8 was added into the mixture. Finally, other components with their amounts shown respectively in Tables 1-4,6-8 were added. Thus, the hair conditioners of Examples 1-4 and Comparative Examples 1-3 were obtained.

Examples 5 and Comparative Example 4 were prepared by the following steps (corresponding to the above mentioned first preparation method).

First, stearoxypropyl dimethylamine (as (c) cationic surfactant) and stearyl alcohol (as (d) fatty alcohol) with their amounts shown respectively in Tables 5,9 were added into water at 55~60°C. Then in the mixture thus obtained, Bis(C13-15 Alkoxy)PG Amodimethicone (as (a)) and isopropyl palmitate (as (b) ester oil) with their amounts shown respectively in Tables 5,9 was added. After that, dimethicone (as (f) silicone which is not an amino-functional silicone) with the

amounts shown respectively in Tables 5,9 was added into the mixture. Finally, other components with their amounts shown respectively in Tables 5,9 were added. Thus, the hair conditioners of Examples 5 and Comparative Example 4 were obtained.

Evaluation method

5 The hair conditioners prepared in Examples 1-5 and Comparative Examples 1-4 were evaluated with the following methods.

A bundle of 20 g (from about 15 to 20 cm) of Asian female hair subjected to cosmetic treatment such as cold waving or bleaching was shampooed. To the resulting hair bundle was applied uniformly 2 g of an hair cosmetic conditioner, followed by rinsing with running water for 10 30 seconds. After that, the hair bundle was towel dried and blow dried. During rinsing and after the drying process, "smoothness", "softness" and "damage-care effect" of the hair bundle was organoleptically evaluated by a panel of five experts. The total of their scores is shown in Table 10.

Evaluation criteria:

"Smoothness"

15 4: Very smooth
3: smooth
2: Not so smooth
1 :Not smooth

"Softness"

20 4: Very soft
3: Soft
2: Not so soft
1: Not soft

"Damage-care effect"

25 4: Very good
3: Good
2: Not so good
1: Not good

[Table 1] (Example 1)

	Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)	Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.5
(b) Ester oil	EXCEPARL IPP	ISOPROPYL PALMITATE	0.75
(c) Cationic surfactant	Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	4.0
(d) Fatty alcohol	Kalcohol 8098	STEARYL ALCOHOL	8.0
(e) Nonionic polymer	HEC DAICEL SE-850K	HYDROXYETHYL CELLULOSE	0.2
(f) Silicone which is not amino-functional silicone	SILICONE KHS-3	DIMETHICONE	2.0
Others	Acid	Lactic acid	1.5
	Fragrance	fragrance	0.35
Water			balance
(b)/(a) by weight	1.5		

[Table 2] (Example 2)

	Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)	Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.1
(b) Ester oil	EXCEPARL IPP	ISOPROPYL PALMITATE	3.0
(c) Cationic surfactant	Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	2.8
(d) Fatty alcohol	Kalcohol 8098	STEARYL ALCOHOL	8.5
(e) Nonionic polymer	HEC DAICEL SE-850K	HYDROXYETHYL CELLULOSE	0.1
(f) Silicone which is not amino-functional silicone	SILICONE KHS-3	DIMETHICONE	1.0
Others	Acid	Lactic acid	2.1
	Fragrance	fragrance	0.35
Water			balance
(b)/(a) by weight	30		

[Table 3] (Example 3)

		Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)		Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	2.0
(b) Ester oil		EXCEPARL IPP	ISOPROPYL PALMITATE	0.1
(c) Cationic surfactant		Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	2.0
(d) Fatty alcohol		Kalcohol 8098	STEARYL ALCOHOL	6.6
(e) Nonionic polymer		HEC DAICEL SE-850K	HYDROXYETHYLCELLULOSE	0.1
(f) Silicone which is not amino-functional silicone		SILICONE KHS-3	DIMETHICONE	0.5
Others	Acid	Lactic acid	Lactic acid	0.9
	Fragrance	fragrance	fragrance	0.35
Water				balance
(b)/(a) by weight		0.05		

[Table 4] (Example 4)

		Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)		Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.5
(b) Ester oil		Exceparl IPP	ISOPROPYL PALMITATE	0.25
(c) Cationic surfactant		Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	4.0
(d) Fatty alcohol		Kalcohol 8098	STEARYL ALCOHOL	8.0
(e) Nonionic polymer		HEC DAICEL SE-850K	HYDROXYETHYL CELLULOSE	0.2
(f) Silicone which is not amino-functional silicone		SILICONE KHS-3	DIMETHICONE	2.0
Others	Acid	Lactic acid	Lactic acid	1.5
	Fragrance	fragrance	fragrance	0.35
Water				balance
(b)/(a) by weight		0.5		

[Table 5] (Example 5)

		Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)		Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.5
(b) Ester oil		Exceparl IPP	ISOPROPYL PALMITATE	2.5
(c) Cationic surfactant		Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	4.0
(d) Fatty alcohol		Kalcohol 8098	STEARYL ALCOHOL	8.0
(e) Nonionic polymer		HEC DAICEL SE-850K	HYDROXYETHYL CELLULOSE	0.2
(f) Silicone which is not amino-functional silicone		SILICONE KHS-3	DIMETHICONE	2.0
Others	Acid	Lactic acid	Lactic acid	1.5
	Fragrance	fragrance	fragrance	0.35
Water				balance
(b)/(a) by weight		5.0		

[Table 6] (Comparative Example 1)

		Raw Material Name	INCI Name	wt. %
(a) compounds represented by formula (1)		/	/	/
(b) ester oil		EXCEPARL IPP	ISOPROPYL PALMITATE	0.75
(c) cationic surfactant		Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	4.0
(d) fatty alcohol		Kalcohol 8098	STEARYL ALCOHOL	8.0
(e) nonionic polymer		HEC DAICEL SE-850K	HYDROXYETHYL CELLULOSE	0.1
(f) silicone which is not amino-functional silicone		SILICONE KHS-3	DIMETHICONE	1.0
Others	Acid	Lactic acid	Lactic acid	1.0
	Fragrance	fragrance	fragrance	0.35
Water				balance
(b)/(a) by weight		/		

[Table 7] (Comparative Example 2)

	Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)	Silicone DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.5
(b) Ester oil	/	/	/
(c) Cationic surfactant	Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	4.0
(d) Fatty alcohol	Kalcohol 8098	STEARYL ALCOHOL	8.0
(e) Nonionic polymer	HEC DAICEL SE-850K	HYDROXYETHYLCELLULOSE	0.1
(f) Silicone which is not amino-functional silicone	SILICONE KHS-3	DIMETHICONE	1.0
Others	Acid	Lactic acid	1.0
	Fragrance	fragrance	0.35
Water			balance
(b)/(a) by weight		0	

[Table 8] (Comparative Example 3)

	Raw Material Name	INCI Name	wt. %
(a) Compounds represented by formula (1)	DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	0.2
(b) Ester oil	EXCEPARL IPP	ISOPROPYL PALMITATE	10
(c) Cationic surfactant	Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	2.8
(d) Fatty alcohol	Kalcohol 8098	STEARYL ALCOHOL	8.5
(e) Nonionic polymer	HEC DAICEL SE-850K	HYDROXYETHYLCELLULOSE	0.1
(f) Silicone which is not amino-functional silicone	SILICONE KHS-3	DIMETHICONE	1.0
Others	Acid	Lactic acid	1.0
	Fragrance	fragrance	0.35
Water			balance
(b)/(a) by weight		50	

[Table 9] (Comparative Example 4)

	Raw Material Name	INCI Name	wt. %
(a) compounds represented by formula (1)	DC 8500	BIS(C13-15 ALKOXY) PG AMODIMETHICONE	2.0
(b) ester oil	EXCEPARL IPP	ISOPROPYL PALMITATE	0.04
(c) cationic surfactant	Farmin DM-E80	STEAROXYPROPYL DIMETHYLAMINE	2.8
(d) fatty alcohol	Kalcohol 8098	STEARYL ALCOHOL	8.5
(e) nonionic polymer	HEC DAICEL SE-850K	HYDROXYETHYLCELLULOSE	0.1
(f) silicone which is not amino-functional silicone	SILICONE KHS-3	DIMETHICONE	1.0
Others	acid	Lactic acid	1.0
	fragrance	fragrance	0.35
Water			balance
(b)/(a) by weight	0.02		

[Table 10] (Evaluation Results)

		Example					Comparative Example			
		1	2	3	4	5	1	2	3	4
Preparation method		fourth	fourth	fourth	fourth	first	fourth	fourth	fourth	first
(b)/(a) by weight		1.5	30	0.05	0.5	5.0	/	0	50	0.02
Evaluation Results	Smoothness	18	17	17	18	19	9	11	11	10
	Softness	19	16	18	18	18	11	13	11	10
	Damage-care effect	19	17	17	18	18	8	10	14	9

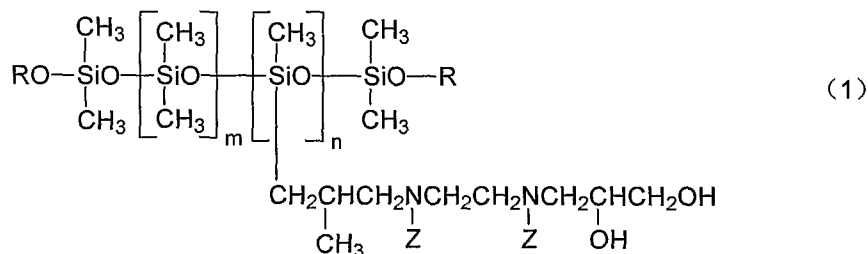
5 As shown in Table 10, the hair conditioners obtained in Example 1 to 5 (with weight ratio of (b)/(a)=0.05~30) show better smoothness and feeling of softness during rinsing and after the drying process than those obtained in Comparative Examples.

As also shown in Table 10, both the hair conditioner prepared by the first preparation method (Example 5) and those prepared by the fourth preparation method (Example 1~4) provide good
10 smoothness and a feeling of softness and a good damage-care effect.

Claims

1. A hair cosmetic composition comprising,

(a) any one or more of the compounds represented by the following formula (1), 0.1~2.0wt%,



wherein, R represents any one or more of hydrocarbon groups from $\text{C}_{13}\text{H}_{27}$ to $\text{C}_{15}\text{H}_{31}$, and 75% of Z represents a group $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ and the remaining portion represents a hydrogen atom, m is 25 to 1000, n is 0.1 to 200,

(b) ester oil, 0.1~3.0wt%,

(c) cationic surfactant, 1~7wt%, and

(d) fatty alcohol, 4~15wt%,

wherein the ratio (b)/(a) by weight is 0.05~30.

2. The hair cosmetic composition of Claim 1, wherein the amount of said Component (a) is 0.3~1.0wt%.

3. The hair cosmetic composition of Claim 1, wherein the amount of said Component (b) is 0.5~1.5wt%.

4. The hair cosmetic composition of Claim 1, wherein said ratio (b)/(a) is 0.5~5.0.

5. The hair cosmetic composition of Claim 1, wherein the amount of said Component (c) is 2~5wt%.

6. The hair cosmetic composition of Claim 1, wherein the amount of said Component (d) is 5~10wt%.

7. The hair cosmetic composition of Claim 1 further comprising (e) a nonionic polymer.

8. The hair cosmetic composition of Claim 1 further comprising (f) a silicone which is not an amino-functional silicone.

9. The hair cosmetic composition of any one of Claims 1~8, wherein said hair cosmetic

composition is a hair conditioning composition.

10. The hair cosmetic composition of any one of Claims 1~8, wherein said hair cosmetic composition is a hair treating composition.

11. A method for producing the hair cosmetic composition of any or more of Claim 1~10, comprising the following steps in the following sequence:

- (1) mixing (b) ester oil, (c) cationic surfactant and (d) fatty alcohol,
- (2) adding (f) silicone which is not amino-functional silicone to the mixture obtained after said step (1),
- (3) adding said Component (a) to the mixture obtained after said step (2).

12. A method for producing the hair cosmetic composition of any one of Claims 1~10, comprising the following steps in the following sequence:

- (1) mixing (c) cationic surfactant and (d) fatty alcohol,
- (2) adding said Component (a) and (b) ester oil to the mixture obtained after said step (1),
- (3) adding (f) silicone which is not an amino-functional silicone to the mixture obtained after said step (2).

13. A hair conditioner comprising the hair cosmetic composition of any of Claims 1~8.

14. A hair treatment comprising the hair cosmetic composition of any of Claims 1~8.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/003144

A. CLASSIFICATION OF SUBJECT MATTER												
See extra sheet												
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)												
IPC: 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)												
EPODOC, WPI, PAJ, CA, MEDLINE, CPRS, CNKI: hair, amino-functional silicone, ester oil, cationic surfactant, alcohol												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
A	US20060051308A (KAO CORPORATION), 9 Mar.2006 (09.03.2006), see abstract	1-14										
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.												
* Special categories of cited documents: <table border="0"><tr><td>"A" document defining the general state of the art which is not considered to be of particular relevance</td><td>"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</td></tr><tr><td>"E" earlier application or patent but published on or after the international filing date</td><td>"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</td></tr><tr><td>"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)</td><td>"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</td></tr><tr><td>"O" document referring to an oral disclosure, use, exhibition or other means</td><td>"&" document member of the same patent family</td></tr><tr><td>"P" document published prior to the international filing date but later than the priority date claimed</td><td></td></tr></table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"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	"E" earlier application or patent but published on or after the international filing date	"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	"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)	"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	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 1 Aug. 2008 (01.08.2008)		Date of mailing of the international search report 21 Aug. 2008 (21.08.2008)										
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451		Authorized officer LIU,Qiming Telephone No. (86-10)62411122										

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2007/003144

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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		JP2004067640A	04.03.2004
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		DE60316954E	29.11.2007

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2007/003144

CLASSIFICATION OF SUBJECT MATTER

A61K 8/89 (2006.01) i

A61K 8/37 (2006.01) i

A61K 8/40 (2006.01) i

A61K 8/34 (2006.01) i

A61Q 5/02 (2006.01) i