

Description

HAIR COSMETIC

[Technical Field]

[0001]

The present invention relates to a hair cosmetic.

[Background Art]

[0002]

In recent years, consumer's preference for the hair style has been changed. Accordingly, preferred performance of hairstyling agents has also been changed from a conventional type of holding the hair using a sticky polymer or a film-forming polymer to a type of providing a soft and natural feel to the hair after finished while maintaining a naturally styled feeling. In recent years, especially women prefer hairstyling agents which provide touch to the hand as if nothing is applied to the hair, a natural appearance without bundling feeling, while providing good finger running through the hair without reducing styling ability.

[0003]

For satisfying such preference, non-aqueous hair cosmetics, particularly products typically called "hair oils" have been provided, but use of such products showed problems due to oil component contained therein: for example, during and after application thereof, oily superficial sliding feeling is maintained for a while, an unnatural bundling feeling is remained, weighty look of hair and weighty touch to the hand are provided after application, and stickiness is maintained.

[0004]

To solve the above problems due to the hair oils, for example, Patent Literature 1 discloses a hair oil which employs a polyether-modified silicone having a specific structure, a volatile oil and ethanol in combination. This literature discloses that the hair oil enables to eliminate the oiliness immediately after application, to provide good compatibility to the hair, and to prevent dryness of hair over time.

[0005]

Additionally, Patent Document 2 discloses a fast drying hair oil containing a specific isoparaffinic hydrocarbon and a specific hydrocarbon. This document discloses that when the fast drying hair oil is applied to the wet hair, the time required for drying hair can be saved and conditioning effect can be imparted to the dry hair.

[0006]

On the other hand, the non-aqueous hair cosmetic products are also used for different purposes other than use as hair oils. Patent Document 3 discloses an agent for coating split hair containing an organic solvent, a volatile oil and a specific dimethylpolysiloxane derivative. This Document discloses that the agent for coating split hair can coat the split hair without stickiness and be easily washed away.

[0007]

(Patent Document 1) JP-A-2011-195471

(Patent Document 2) JP-A-2015-003886

(Patent Document 3) JP-A-8-40839

[Summary of the Invention]

[0008]

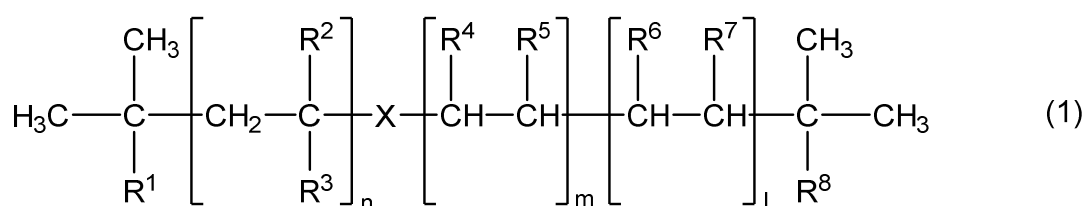
The present invention provides a hair cosmetic which comprises the following components (A) to (C):

(A) hair cosmetic polymer having solubility or dispersibility in water or ethanol,

(B) C₁₋₄ monohydric alcohol, and

(C) C₉₋₂₁ liquid oil represented by formula (1):

[0009]



[0010]

in the formula, R¹ to R⁸ each independently represent a hydrogen atom or a methyl group, X represents -CH₂-, -COO-, or -CH₂COO-, n represents 1 to 7, m represents 0 to 2, l represents 0 to 2, and n+m+l is 1 to 7, provided that any one of R⁴ to R⁷ is a methyl group when both m and l are 1 or more,

wherein content of the component (A) is 0.1 mass% or more and 10 mass% or less and mass ratio of the component (B) to the component (C), (B)/(C), is 0.8 or more and 99 or less.

[Detailed Description of the Invention]

[0011]

The hair oil of Patent Document 1 and 2, when applied to the after-washed wet hair, can impart a setting feeling and a conditioning effect after drying; however, when applied to the dry hair, shows problems such as unsatisfactory setting and feel after drying due to uneven wet spreadability caused by difference of damage level. Another problem occurs when a sufficient amount is applied for uniform application of the hair oil throughout the entire hair, resulting in provision of weighty look and bundling

feeling after drying. Further, the hair oil of Patent Document 2, although can increase rate of water evaporation in wet hair after washing, impart strong unnatural touch due to volatile oil to the hand after application to the dry hair until drying out, therefore, the hair oil should be improved.

[0012]

The Patent Document 3 describes that the agent for coating split hair preferably contains as much as 10 to 50 wt%, particularly 20 to 40 wt%, of a dimethylpolysiloxane derivative in the entire composition for coating split hair. For this reason, a large amount of dimethylpolysiloxane derivative is remained on the hair after drying, resulting in remaining weighty look or bundling feeling, and making provision of silky feel difficult.

[0013]

Thus, the present invention relates to a hair cosmetic which enables to show good wet spreadability when applied to the dry hair regardless of damage level of hair, to be easily dried after application, to prevent imparting friction feeling or wet hair feeling, and to provide natural setting to the hair without making tresses after drying.

[0014]

The present inventor's investigation has been carried out after considering that the above-described problems on the non-aqueous hair cosmetics are largely due to difference of wet spreadability on the dry hair by difference of damage level of hair and time consumption for volatilizing volatile oil after application thereof. As a result, the inventors found that, by employing a specific volatile oil and a lower alcohol in a specific ratio, a surface tension of a solvent remarkably decreases, and the hair cosmetic applied onto the hair can be more rapidly wet-spread

thinly and evenly. Consequently, the inventor has found that the polymer component contained therein can be immediately and uniformly applied to the hair surface, and further, a feeling of a hair cosmetic presence on the hair can be disappeared immediately after application due to immediate volatilization of the hair cosmetic, and further, the hair after drying can be easily styled, accordingly has completed the present invention.

[0015]

The hair cosmetic of the present invention shows remarkably improved wet spreadability on the hair surface of dry hair, spontaneously wet-spreads, while immediately dries. Accordingly, the polymer in the hair cosmetic immediately spreads uniformly to form thin layer on the hair surface, the feeling of a hair cosmetic presence quickly disappears after application, a natural setting is imparted without providing touch to the hand as if something is applied and without providing unnatural bundling feeling. Further, no friction feeling or stickiness or wet-hair feeling are imparted during application.

[0016]

[Component (A): Hair cosmetic polymer having solubility or dispersibility in water or ethanol]

The component (A) is a polymer which is dissolved or stably dispersed in water or ethanol without using a surfactant and can be stably present in a solvent having a polarity such as the component (B). Such a component (A) is a component which can impart a natural setting feeling and a natural feel to the hair without a feeling of a polymer presence when uniformly applied to the hair surface according to the formulation of the present invention. Film-forming polymers and polyether-modified silicones are preferable to be such

a hair cosmetic polymer having solubility or dispersibility in water or ethanol.

[0017]

From the standpoint of further enhancing a setting feeling, a film-forming polymer is preferably used as the component (A). The film-forming polymer suitable for use as the component (A) is not particularly limited as long as it has solubility or dispersibility in water or ethanol, and any polymer typically used in hairstyling agents from those having a strong setting power to those having a comparatively low setting power can be used.

[0018]

Examples of the film-forming polymer include silicone-based graft polymers, urethane polymer-based compounds, polyvinylpyrrolidone-based polymer compounds, anionic vinyl ether-based polymer compounds, anionic polyvinyl acetate-based polymer compounds, anionic (meth)acrylic polymer-based compounds, amphoteric (meth)acrylic polymer-based compounds, nonionic (meth)acrylic polymer-based compounds, cationic (meth)acrylic polymer-based compounds, and maleimide polymer-based compounds.

[0019]

Examples of the silicone-based graft polymer include polysilicone-9 such as poly(N-formylethyleneimine)organopolysiloxane, poly(N-acetyleneimine)organopolysiloxane, and poly(N-propionylethyleneimine)organopolysiloxane; organopolysiloxane graft polymers described in International Publication No. W02014/002707 such as polysilicone-28; alkyl acrylate copolymer methylpolysiloxane esters such as KP-545 (Shin-Etsu Chemical Co., Ltd.); polysilicone-17 such as Silsoft Spread TT (Momentive Performance Materials Inc.); and alkyl acrylate-methacrylic acid-

silicone copolymers such as Luviflex Silk (BASF). Among these, polysilicone-9 such as poly(N-formylethyleneimine)organopolysiloxane, poly(N-acetylethyleneimine)organopolysiloxane, and poly(N-propionylethyleneimine)organopolysiloxane; organopolysiloxane graft polymers described in International Publication No. W02014/002707 such as polysilicone-28; and alkyl acrylate copolymer methylpolysiloxane esters such as KP-545 (Shin-Etsu Chemical Co., Ltd.) are more preferable from the standpoint of setting property, absence of stickiness when drying, softness after application, and finger running property after application.

[0020]

Examples of the urethane-based polymer compound include polyurethanes such as Luviset P.U.R. (BASF Japan); and polyurethane-14-AMP-acrylates copolymers such as Dynam X (Akzo Nobel).

[0021]

Examples of the polyvinylpyrrolidone-based polymer compounds include polyvinylpyrrolidones such as Luviskol K12, Luviskol K17, Luviskol K30, Luviskol L60, Luviskol K80, and Luviskol K90 (BASF); and PVP K15, PVP K17, PVP K30, PVP K60, PVP K90, and PVP K120 (all from Ashland Inc.); polyvinyl caprolactams such as Luviskol VA28, Luviskol VA37, Luviskol VA55, Luviskol VA64P, Luviskol VA73 (all from BASF); and Luviskol Plus (BASF); (vinylpyrrolidone/vinyl acetate)copolymers such as PVP/VA E-735, PVP/VA E-635, PVP/VA E-535, PVP/VA E-335, PVP/VA S-630, and PVP/VA W-735 (all from Ashland Inc.); polyvinylpyrrolidone/vinyl acetate/vinyl propionate terpolymers such as Luviskol VAP343 (BASF); polyvinylpyrrolidone/dimethylaminomethyl/acrylic acid copolymers such as Luviflex (BASF); copolymer 845, copolymer 937, and

copolymer 958 (all from Ashland Inc.); polyvinylpyrrolidone/dimethylaminoethylmethacrylate/vinylcaprolactam copolymers such as copolymer VC-713 (Ashland Inc.); (VP/methacrylamide/vinylimidazole) copolymers such as Luviset Clear (BASF); and vinyl methylimidazolium metachloride/vinylpyrrolidone copolymers such as Luviquat HM552 (BASF). Among these, (vinylpyrrolidone/vinyl acetate) copolymers and polyvinylpyrrolidones are more preferable from the standpoint of smoothness immediately after application, setting property, absence of stickiness when drying, and softness after application.

[0022]

Examples of the anionic vinyl ether-based polymer compound include (vinyl methyl ether/ethyl maleate) copolymers such as Gantrez ES-225 (Ashland Inc.); and (vinyl methyl ether/butyl maleate) copolymers such as Gantrez ES-425 (Ashland Inc.). Among these, (vinyl methyl ether/butyl maleate) copolymers are preferable from the standpoint of setting property, absence of stickiness when drying, and softness after application.

[0023]

Examples of the anionic polyvinyl acetate-based polymer compound include vinyl acetate/crotonic acid copolymers such as Resyn 28-1310 (Akzo Nobel) and Luviset CA66 (BASF); (vinyl acetate/crotonic acid/vinyl neodecanoate) copolymers such as Resyn 28-2930 (Akzo Nobel); and vinyl acetate/crotonic acid /vinyl propionate copolymers such as Luviset CAP (BASF).

[0024]

Examples of the anionic (meth)acrylic-based polymer compound include acrylic resin alkanolamine solutions such as Plascize L-53P and Plascize L-9540B (all from Goo Chemical Co., Ltd.); acrylic acid/acrylic ester copolymers such as Diahold (Mitsubishi Chemical

Corporation); acrylic acid/acrylic acid amide/ethyl acrylate copolymers such as Ultrahold 8, Ultrahold strong (all from BASF), Amphomer V-42, and Dermacryl 79 (all from Akzo Nobel); and alkyl acrylate copolymers such as Aniset NF-1000 and Aniset HS-3000 (all from OSAKA ORGANIC CHEMICAL INDUSTRY LTD).

[0025]

Examples of the amphoteric (meth)acrylic-based polymer compound include (methacryloyloxyethylcarboxybetaine/alkyl methacrylate) copolymers such as Yukaformer M-75, Yukaformer R205, Yukaformer 301, Yukaformer SM (all from Mitsubishi Chemical Corporation), and RAM Resin (OSAKA ORGANIC CHEMICAL INDUSTRY LTD); (octylacrylamide/hydroxypropyl acrylate/butylaminoethyl methacrylate) copolymers such as Amphomer 28-4910 and Amphomer LV-71 (all from Akzo Nobel); (alkyl acrylate/octylacrylamide) copolymers such as Amphomer HC (Akzo Nobel); and (acrylates/lauryl acrylate/stearyl acrylate/ethylamine oxide methacrylate) copolymers such as DIAFORMER Z-651 (Mitsubishi Chemical Corporation). Among these, (methacryloyloxyethylcarboxybetaine/alkyl methacrylate) copolymers are preferable from the standpoint of setting property, absence of stickiness when drying, and softness after application.

[0026]

Examples of the nonionic (meth)acrylic-based polymer compound include (dimethylacrylamide/hydroxyethyl acrylate/methoxyethyl acrylate) copolymers such as Plascize L-2700 and Plascize L-2714 (all from Goo Chemical Co., Ltd.).

[0027]

Examples of the cationic (meth)acrylic-based polymer compound include alkylacrylamide/acrylate/alkylaminoalkylacrylamide/polyethyleneglycol methacrylate copolymers described in JP-A-2-180911;

alkylacrylamide/alkylaminoalkylacrylamide/polyethyleneglycol methacrylate copolymers described in JP-A-8-291206; Polyquaternium-99 such as Plascize L-515 (Goo Chemical Co., Ltd.); (PVP/vinylcaprolactam/acrylic acid DMAPA) copolymers such as AQUAFLEX SF-40 (Ashland Inc.); (vinylpyrrolidone/acrylic acid DMAPA) copolymers such as Styleze CC-10 (Ashland Inc.); and quaternary compounds of vinylpyrrolidone/dimethylaminomethacrylate copolymers (Polyquaternium-11) such as Luviquat PQ11 (BASF), GAFQUAT 734, and GAFQUAT 755 (all from Ashland Inc.). Among these, alkylacrylamide/acrylate/alkylaminoalkylacrylamide/polyethyleneglycol methacrylate copolymers described in JP-A-2-180911, alkylacrylamide/alkylaminoalkylacrylamide/polyethyleneglycol methacrylate copolymers described in JP-A-8-291206, and Polyquaternium-11 are preferable.

[0028]

Examples of the maleimide-based polymer compound include (isobutylene/ethylmaleimide/hydroxyethylmaleimide) copolymers such as AQUAFLEX FX-64 (ISP Japan Ltd.).

[0029]

Among these film-forming polymers, silicone-based graft polymers, polyvinylpyrrolidone-based polymer compounds, anionic polyvinyl acetate-based polymer compounds, amphoteric (meth)acrylic-based polymer compounds, nonionic(meth)acrylic-based polymers, and cationic (meth)acrylic-based compounds are more preferable from the standpoint of setting property, absence of stickiness when drying, and softness after application.

[0030]

On the other hand, a polyether-modified silicone is preferably used as the component (A) from the standpoint of further enhancing the absence of friction immediately after application and a setting

after drying. The polyether-modified silicone used to be the component (A) is not particularly limited as long as it has solubility or dispersibility in water or ethanol, and examples include polyoxyethylene-modified silicones, polypropylene-modified silicones, polyoxyethylene/polyoxypropylene-modified silicones, and polyglycerol-modified silicones, with examples of the modification form including pendant forms (side-chain modification forms) and straight-chain copolymer forms.

[0031]

The polyether-modified silicone is preferably a copolymer having a block chain of an organosiloxane chain and a polyalkylene chain, and examples include (PEG-40/PPG-8 methylaminopropyl/hydropropyl dimethicone) copolymers such as Silsoft A+ (Momentive Performance Materials Inc.); polysilicone-13 such as FZ-2222, FZ-2233, and CB2250 (Dow Corning Toray Co., Ltd.); PEG-12 dimethicones such as Silwet L-8600 (Momentive Performance Materials Inc.), PPG-12 dimethicones such as Silsoft 900 (Momentive Performance Materials Inc.); PEG-10 dimethicones such as Silsoft 860 (Momentive Performance Materials Inc.); (bisisobutyl PEG-14/amodimethicone) copolymers such as Silstyle 104 (Dow Corning Toray Co., Ltd.); (bisisobutyl PEG/PPG-20/35/amodimethicone) copolymers such as Silstyle 401 (Dow Corning Toray Co., Ltd.); bis-isopropanolamino-PG-propyl dimethicone/bis-isobutyl PEG-14 copolymers such as CE-8411 Smooth Plus Emulsion (Dow Corning Toray Co., Ltd.); and (bisisobutyl PEG-15/amodimethicone) copolymers such as DOW CORNING TORAY SS-3588 (Dow Corning Toray Co., Ltd.). Among these, a copolymer having a block chain of an amino-modified organopolysiloxane chain and a polyoxyalkylene chain is preferable, straight-chain copolymer amino-polyether-modified silicones such as (bisisobutyl PEG-14/amodimethicone) copolymers, (bisisobutyl

PEG/PPG-20/35/amodimethicone) copolymers, bis-isopropanolamino-PG-propyl dimethicone/bis-isobutyl PEG-14 copolymers, and (bisisobutyl PEG-15/amodimethicone) copolymers are more preferable, and (bisisobutyl PEG-15/amodimethicone)copolymers are further preferable.

[0032]

These polymers for hair cosmetic can be used singly or in combinations of two or more, but from the standpoint of further enhancing both of a natural setting feeling and a natural feel, the above film-forming polymer and polyether-modified silicone are used in combination as the component (A).

[0033]

Additionally, the component (A) is preferably an amphiphilic film-forming polymer or polyether-modified silicone from the standpoint of remaining thinly and uniformly on the hair without causing stickiness when drying and further imparting a natural feel and setting. The amphiphilic film-forming polymer is a set polymer containing 10 to 98% in terms of mass ratio of a hydrophobic part, and examples of the amphiphilic set polymer include polysilicone-9 and polysilicone-28 with polysilicone-9 being particularly preferable.

[0034]

The content of the component (A) in the hair cosmetic of the present invention is, from the standpoint of imparting a hair setting, 0.1 mass% or more, preferably 0.5 mass% or more, and more preferably 1 mass% or more. Further, the content is, from the standpoint of imparting a natural feel and a setting feeling without causing a weighty look and a bundling feeling to the hair, 10 mass% or less, preferably 7 mass% or less, and more preferably 5 mass% or less.

[0035]

[Component (B): C₁₋₄ monohydric alcohol]

The component (B), in combination with the component (C), is a component for controlling the wet spreadability and drying speed on the hair of the hair cosmetic containing the component (A). For the C₁₋₄ monohydric alcohol for the component (B), saturated or unsaturated aliphatic alcohols can be used. These monohydric alcohols can be used singly or in combinations of two or more. For the alcohol, ethanol, propanol, isopropanol, and tert-butyl alcohol are preferable, with ethanol and isopropanol being more preferable, and ethanol being further preferable.

[0036]

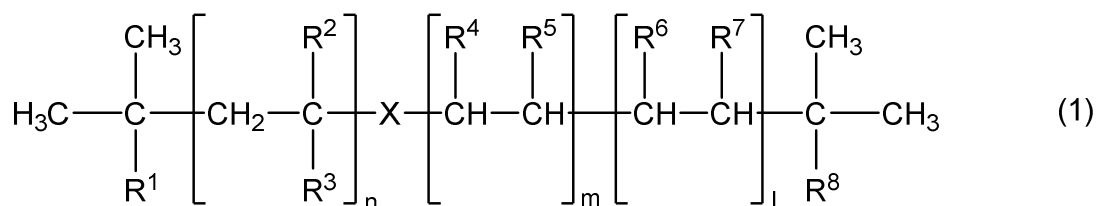
The content of the component (B) in the hair cosmetic of the present invention is, from the standpoint of drying speed and absence of a bundling feeling, preferably 45 mass% or more, more preferably 55 mass% or more, and further preferably 60 mass% or more, and is, from the standpoint of the absence of friction after application, preferably 98 mass% or less, more preferably 90 mass% or less, more preferably 80 mass% or less, and further preferably 75 mass% or less.

[0037]

[Component (C): C₉₋₂₁ Liquid oil represented by formula (1)]

The component (C) is, in combination with the component (B), a component for controlling the wet spreadability of the hair cosmetic and drying speed on the hair of the hair cosmetic and preferably a low boiling point non-polar oil agent. Additionally, in combination with the component (B), the component (C) itself loses a feeling of the presence after application and provides a silky natural feel. The liquid oil of the component (C) is represented by the following formula (1).

[0038]



[0039]

In the formula, R^1 to R^8 each independently represent a hydrogen atom or a methyl group, X represents $-\text{CH}_2-$, $-\text{COO}-$, or $-\text{CH}_2\text{COO}-$, n represents 1 to 7, m represents 0 to 2, l represents 0 to 2, and $n+m+l$ is 1 to 7, provided that any one of R^4 to R^7 is a methyl group when both m and l are 1 or more.

[0040]

Such a component (C) includes preferably isododecane, hydrogenated polyisobutene, isononyl isononate, and isopropyl isostearate, more preferably isododecane, hydrogenated polyisobutene, and isononyl isononate, and further preferably isododecane and hydrogenated polyisobutene.

[0041]

Examples of the preferable liquid oil include isododecanes and hydrogenated polyisobutenes wherein X is $-\text{CH}_2-$, m is 0, l is 0, and n is 1 to 3. Examples of such an isododecane include isododecanes wherein, in the formula (1), R^1 , R^2 and R^8 are methyl groups, R^3 is a hydrogen atom, and $n = 1$ (MARUKASOL R, MARUZEN PETROCHEMICAL CO., LTD.). Additionally, in the case of hydrogenated polyisobutene, the n in the formula (1) represents an average polymerization degree of the isobutene in parentheses and is more preferably 1 to 2, and further preferably 1. Examples of such a compound include hydrogenated polyisobutenes wherein, in the formula (1), R^1 , R^2 and R^3 are methyl groups, R^8 is a hydrogen atom, and $n = 1$ (PARLEAM 3, NOF CORPORATION) and hydrogenated polyisobutenes wherein R^1 , R^2 and

R^3 are methyl groups, R^8 is a hydrogen atom, and $n = 2$ (PARLEAM 4, NOF CORPORATION).

[0042]

The content of the component (C) in the hair cosmetic of the present invention is, from the standpoint of slipping property and goodness in finger running after application, preferably 1 mass% or more, more preferably 10 mass% or more, further preferably 20 mass% or more, and further preferably 25 mass% or more, and is, from the standpoint of the absence of a bundling feeling, lightness, and high-temperature stability of the formula after drying, preferably 52 mass% or less, more preferably 45 mass% or less, further preferably 40 mass% or less, and further preferably 35 mass% or less.

[0043]

Further, the mass ratio of the component (B) to the component (C), $(B)/(C)$, in the hair cosmetic of the present invention is 0.8 or more and 99 or less. The hair cosmetic of the present invention in this range has a decreased surface tension and dries immediately on the hair surface while wets and spreads on the hair surface spontaneously and immediately at the moment when applied to the hair surface whether the hair is healthy or damaged. For this reason, tresses are hardly formed after application, a feeling of a hair cosmetic presence disappears immediately, and a natural setting is imparted while a touch to the hand is as if nothing is applied. Further, there is no superficial sliding feeling or slimy feeling during application, and the hair does not have a wet feel. From the standpoint of further enhancing these effects, the mass ratio of the component (B) to the component (C), $(B)/(C)$, is preferably 1 or more, more preferably 1.2 or more, further preferably 1.5 or more, and further preferably 2 or more, and

preferably 50 or less, more preferably 30 or less, further preferably 10 or less, and further preferably 5 or less.

[0044]

[Component (D): Stabilizer]

The hair cosmetic of the present invention preferably further contains, from the standpoint of allowing stable preservation even at a high temperature without the hair cosmetic being separated, one or two or more selected from the group consisting of polyols, urea, organic acids, polyoxyalkylene alkyl glucosides and polyoxyalkylene glyceryl ethers as a component (D). Examples of the preferable polyol include 1,3-butanediol, glycerin, and polyglycerin. Further, examples of the preferable organic acid include lactic acid, malic acid, and citric acid. Furthermore, examples of the preferable polyoxyalkylene alkyl glucoside include PPG-10 methyl glucose, PPG-20 methyl glucose, methyl gluceth-10, and methyl gluceth-20. Additionally, examples of the preferable polyoxyalkylene glyceryl ether include PEG/PPG/polybutyleneglycol-8/5/3 glycerin. Among these, from the standpoint of high-temperature preservation stability, urea, lactic acid, glycerin are preferable, with urea being more preferable.

[0045]

The content of the component (D) in the hair cosmetic of the present invention is, from the standpoint of ensuring high-temperature stability, preferably 0.1 mass% or more, and more preferably 0.5 mass% or more, and is, from the standpoint of keeping a natural feel, preferably 3 mass% or less, and more preferably 2 mass% or less.

[0046]

[Water]

The hair cosmetic of the present invention does not preferably contain water. However, a trace to small amount (e.g., 0.0001 mass% or more) of water contamination may be inevitable but, even in such a case, a water content is preferably small. Specifically, the content of water is preferably less than 5 mass%, more preferably less than 3 mass%, and further preferably less than 0.5 mass%.

[0047]

[Optional components]

The hair cosmetic of the present invention may contain an oil agent for cosmetic other than the components (A) and (C) in addition to the components described so far within a limit which does not impair the effect of the present invention. The content of the oil agent for cosmetic other than the components (A) and (C) in the hair cosmetic is preferably 0.1 to 10 mass%. Examples of the oil agent for cosmetic include glycerides such as castor oil, cacao oil, mink oil, avocado oil, and olive oil; waxes such as beeswax, spermaceti, lanolin, and carnauba wax; esters such as isopropyl myristate, hexyl laurate, cetyl lactate, propylene glycol monostearate, oleyl oleate, hexadecyl 2-ethylhexanoate, octyldodecyl myristate; and silicone derivatives excluding those contained in the component(A) such as dimethylpolysiloxane, methylphenylpolysiloxane, epoxy-modified silicone oil, amino-modified silicone oils, and alkyl-modified silicone oil.

[0048]

Further, the hair cosmetic of the present invention can contain a fragrance and a coloring for enhancing the product value and preservatives and antioxidants for protecting the hair cosmetic from quality deterioration with the lapse of time, and may further contain as necessary a surfactant, a curing agent, an anti-static agent, a defoaming agent, a dispersant, a thickener, an ultraviolet

absorber, an antioxidant, a preservative, a colored dye, a dye fixer, or a propellant.

[0049]

[Agent form]

The agent form of hair cosmetic of the present invention is not particularly limited and can be in the form of a clear liquid, a lotion, an emulsion, a mist (hair mist, hair spray), or a foam (hair mousse), but, among these, the agent form that is applied in the form of a mist is preferable, and the agent form of non-aerosol form is more preferable. When a non-aerosol hair cosmetic is prepared, the component (A) is preferably an amphiphilic film-forming polymer or polyether-modified silicone from the standpoint of having good dispersibility or solubility in both the component (B) and component (C).

[0050]

When the hair cosmetic of the present invention is used as an aerosol form hair cosmetic consisting of an aerosol stock solution and a propellant, the content of each component refers to a content in the entire composition of aerosol stock solution excluding the propellant.

[0051]

[Hairstyling method]

The hair cosmetic of the present invention can be preferably used as a hairstyling agent. The method of use as the hairstyling agent, that is, the hairstyling method, can be any method as long as a method arranges a hairstyle by applying the hair cosmetic of the present invention to the hair. The hair cosmetic of the present invention may apply to the wet hair or dry hair but applying to the dry hair is preferable.

[0052]

For example, it is preferable that the hair cosmetic be directly applied in the form of mist and a hairstyle is arranged while combing by hand, a comb or brush.

[0053]

In regard with the embodiments described above, preferable aspects of the present invention are disclosed below.

[0054]

<1>

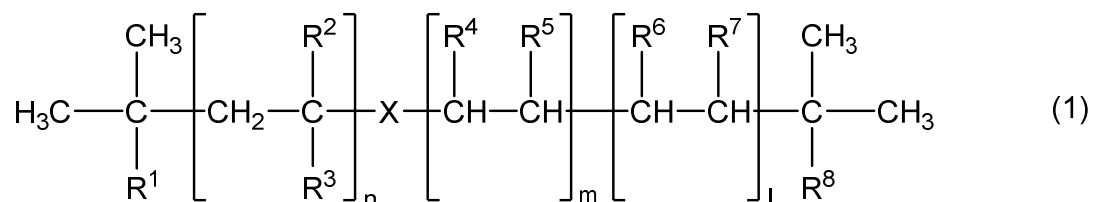
A hair cosmetic comprising the following components (A) to (C):

(A) hair cosmetic polymer having solubility or dispersibility in water or ethanol,

(B) C₁₋₄ monohydric alcohol, and

(C) C₉₋₂₁ liquid oil represented by formula (1)

[0055]



[0056]

in the formula, R¹ to R⁸ each independently represent a hydrogen atom or a methyl group, X is -CH₂-, -COO-, or -CH₂COO-, n is 1 to 7, m is 0 to 2, l is 0 to 2, and n+m+l is 1 to 7, provided that any one of R⁴ to R⁷ is a methyl group when both m and l are 1 or more,

wherein content of the component (A) is 0.1 mass% or more and 10 mass% or less, and mass ratio of the component (B) to the component (C), (B)/(C), is 0.8 or more and 99 or less.

[0057]

<2>

The hair cosmetic according to <1>, wherein the component (A) is one or two or more selected from the group consisting of film-forming polymers and polyether-modified silicones, more preferably one or two or more selected from the group consisting of amphiphilic film-forming polymers and polyether-modified silicones.

[0058]

<3>

The hair cosmetic according to <1> or <2>, wherein the component (A) is preferably a (bisisobutyl PEG-15/amodimethicone) copolymer, polysilicone-9 or polysilicone-28, and more preferably polysilicone-9.

[0059]

<4>

The hair cosmetic according to any one of <1> to <3>, wherein content of the component (A) is preferably 0.5 mass% or more, more preferably 1 mass% or more, and preferably 7 mass% or less, more preferably 5 mass% or less.

[0060]

<5>

The hair cosmetic according to any one of <1> to <4>, wherein the component (B) is preferably one or two or more selected from the group consisting of ethanol, propanol, isopropanol, and tert-butyl alcohol, and is more preferably ethanol.

[0061]

<6>

The hair cosmetic according to any one of <1> to <5>, wherein content of the component (B) is preferably 45 mass% or more, more preferably 55 mass% or more, further preferably 60 mass% or more, and preferably 98 mass% or less, more preferably 90 mass% or less,

further preferably 80 mass% or less, further preferably 75 mass% or less.

[0062]

<7>

The hair cosmetic according to any one of <1> to <6>, wherein the component (C) is preferably one or two or more selected from the group consisting of isododecane, hydrogenated polyisobutene, isononyl isononate, and isopropyl isostearate, more preferably one or two or more selected from the group consisting of isododecane, hydrogenated polyisobutene, and isononyl isononate, and further preferably one or two or more selected from the group consisting of isododecane and hydrogenated polyisobutene.

[0063]

<8>

The hair cosmetic according to <7>, wherein the component (C) is preferably hydrogenated polyisobutene wherein, in the formula (1), R^1 , R^2 and R^3 are methyl groups, R^8 is a hydrogen atom, and $n = 1$.

[0064]

<9>

The hair cosmetic according to any one of <1> to <8>, wherein content of the component (C) is preferably 1 mass% or more, more preferably 10 mass% or more, further preferably 20 mass% or more, and further preferably 25 mass% or more, and is preferably 52 mass% or less, more preferably 45 mass% or less, further preferably 40 mass% or less, and further preferably 35 mass% or less.

[0065]

<10>

The hair cosmetic according to any one of <1> to <9>, wherein the mass ratio of the component (B) to the component (C), $(B)/(C)$,

is preferably 1 or more, more preferably 1.2 or more, further preferably 1.5 or more, further preferably 2 or more, and preferably 50 or less, more preferably 10 or less, further preferably 5 or less.

[0066]

<11>

The hair cosmetic according to any one of <1> to <10>, preferably further comprising, as component (D), one or two or more selected from the group consisting of polyols, urea, organic acids, polyoxyalkylene alkyl glucosides and polyoxyalkylene glyceryl ethers.

[0067]

<12>

The hair cosmetic according to <11>, wherein the component (D) is preferably one or two or more selected from the group consisting of urea, lactic acids and glycerin, and is more preferably urea.

[0068]

<13>

The hair cosmetic according to <12>, wherein content of the component (D) is preferably 0.1 mass% or more, further preferably 0.5 mass% or more, and preferably 3 mass% or less, more preferably 2 mass% or less.

[0069]

<14>

The hair cosmetic according to any one of <1> to <13>, wherein content of water is preferably less than 5 mass%, more preferably less than 3 mass%, and further preferably less than 0.5 mass%, and further preferably water is not contained.

[0070]

<15>

The hair cosmetic according to any one of <1> to <14>, preferably being a non-aerosol type hair mist.

[0071]

<16>

Use of the hair cosmetic according to any one of <1> to <15> as a hairstyling agent.

[Examples]

[0072]

Hereinafter, although the present invention is further specifically described in reference to Examples, the present invention is not limited to embodiments of these Examples.

[0073]

[Experimental Examples 1 to 13]

For artificially verifying the spontaneous wet spreadability on the surface of damaged hair and the surface of healthy hair, the compositions shown in Table 1 were prepared, 50 μ L of each was dropped from 1 cm above the film surface using a micropipette (Research Plus V 3120, manufactured by Eppendorf AG) on a film having hydrophilic surface ("Sukkiri film" (anti-fog film), manufactured by Allfolia Japan CO., LTD) and a film having hydrophobic surface (recycled clear plastic holder, manufactured by OTSUKA CORPORATION, model No. TCHEA4-100), respectively. Thirty seconds after the dropping, a major axis and a minor axis of the droplet spread on the film surface were measured and an area was calculated by (major axis $\times$ minor axis $\times$ circumference ratio).

[0074]

[Table 1]

(Mass%)		Experimental Examples												
		1	2	3	4	5	6	7	8	9	10	11	12	13
(B)	Ethanol	70	90	50	70	70	100	-	-	70	70	70	70	70
(B')	Water	-	-	-	-	-	-	100	-	30	-	-	-	-
(C)	Hydrogenated polyisobutene (*1)	30	10	50	-	-	-	-	100	-	-	-	-	-
	Isododecane (*2)	-	-	-	30	-	-	-	-	-	-	-	-	-
	Isononyl isononate	-	-	-	-	30	-	-	-	-	-	-	-	-
(C')	Decamethylcyclopentasiloxane	-	-	-	-	-	-	-	-	-	30	-	-	-
	Dimethicone (1cs)	-	-	-	-	-	-	-	-	-	-	30	-	-
	Dimethicone (5cs)	-	-	-	-	-	-	-	-	-	-	-	30	-
	Octyldodecyl Lactate	-	-	-	-	-	-	-	-	-	-	-	-	30
Mass ratio (B)/(C)		2.3	9.0	1.0	2.3	2.3	-	-	0.0	-	2.3	2.3	2.3	2.3
Hydrophobic film (mm ²)		3154	4307	3391	1617	1638	422	129	555	226	503	531	572	661
Hydrophilic film (mm ²)		5053	5823	3218	2673	3565	928	604	1295	518	545	558	585	1073

*1: PARLEAM 3, NOF CORPORATION

*2: MARUKASOL R, MARUZEN PETROCHEMICAL CO., LTD.

[0075]

As evident from Experimental Examples 1 to 5, the droplets largely spread on both hydrophilic film and hydrophobic film if the component(B) and the component (C) were contained and the mass ratio of the component (B) to the component (C), $(B)/(C)$, is in the range according to claim 1, compared with the case if only the component (B) is contained (Experimental Example 6) and the case if only the component (C) is contained (Experimental Example 8), therefore showed excellent spontaneous wet spreadability. While, as shown in Experimental Examples 10 to 13, this effect was not observed in the cases if the liquid oil did not correspond to the component (C).

[0076]

[Examples 1 to 6 and Comparative Examples 1 to 6]

Referring the Experimental Examples, the hair cosmetics described in Table 2 were prepared by a routine method, and the spontaneous wet spreadability on the hydrophilic film and the hydrophobic film was evaluated according to the same method as in the Experimental Examples.

Additionally, the hair cosmetic described in Table 2 was filled in a Yoshino Seisakusho pump spray container (spraying the hair cosmetics of Examples and Comparative Examples as mist having average particle diameter of 60 μm) and performance evaluations were carried out in accordance with the following methods and criteria.

[0077]

(Tress for the evaluation)

Japanese tender curly hair having not chemical treatment history was used to prepare a tress having a length of 30 cm and a weight of 8 g. 3 g of "SUCCESS medicated Shampoo h" (manufactured

by Kao Corporation) was applied to the tress, foamed and cleansed for 30 seconds, and rinsed out for 30 seconds with tap water at 40°C. The shampooing procedure was repeated twice. Subsequently, 3 g of a model rinse having the following formula was applied, incubated for 15 seconds, and then rinsed out for 30 seconds with tap water at 40°C. Subsequently, the tress was towel dried and then air dried under the laboratory conditions for 6 hours, to prepare a tress for use in evaluation.

[0078]

(Composition of the model rinse)

<u>Component</u>	<u>(mass%)</u>
Cetearyl Alcohol	2.0
Steartrimonium Chloride	0.76
Distearyldimonium Chloride	2.7
Propylene glycol	5.0
Isopropanol	0.6
Ethylparaben	0.1
<u>Deionized water</u>	<u>balance</u>
Total	100

[0079]

(Evaluation method)

"Drying speed immediately after application"

0.2 g of each hair cosmetic filled in the pump spray was sprayed throughout the entire tress for the evaluation. After sprayed, the tress for the evaluation was combed by hand 30 times. The drying speed while combing by hand was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "fast drying"/"not either"/"slow drying" when the tress was treated by the above procedure using each composition.

The number of panelists who answered "fast drying"/"cannot say"/"slow drying" are shown in this order.

[0080]

"Absence of friction immediately after application"

The tress was treated by the same method as the "Drying speed immediately after application", and the absence of a friction feeling while repeatedly combing the tress by the hand 1 to 10 times was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "friction feeling is absent"/"not either"/"friction feeling is present" when the tress was treated by the above procedure using each composition. The number of panelists who answered "friction feeling is absent"/"not either"/"friction feeling is present" is presented in this order.

[0081]

"Goodness in finger running immediately after application"

The tress was treated by the same method as the "Drying speed immediately after application", and the goodness in finger running while repeatedly combing the tress by the hand 1 to 10 times was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "good finger running"/"not either"/"poor finger running" when the tress was treated by the above procedure using each composition. The number of panelists who answered "good finger running"/"not either"/"poor finger running" are shown in this order.

[0082]

"Absence of stickiness when hand combing"

The tress was treated by the same method as the "Drying speed immediately after application", and the absence of stickiness while

combing the tress by the hand was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "stickiness is absent"/"not either"/"sticky" when the tress was treated by the above procedure using each composition. The number of panelists who answered "good finger running"/"not either"/"poor finger running" are shown in this order.

[0083]

"Absence of a bundling feeling after drying"

The tress was treated by the same method as the "Drying speed immediately after application" and allowed to stand for 3 minutes after hand combing was completed. Subsequently, the absence of a bundling feeling was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "bundling feeling is absent"/"moderate bundling feeling is present"/"bundling feeling is present" when the tress was treated by the above procedure using each composition. The number of panelists who answered "bundling feeling is absent"/"moderate bundling feeling is present"/"bundling feeling is present" are shown in this order.

[0084]

"Setting after drying"

The tress was treated by the same method as the "Drying speed immediately after application" and allowed to stand for 3 minutes after hand combing was completed. Subsequently, the setting was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "styled easily"/"styled moderately"/"not styled" when the tress was treated by the above procedure using each

composition. The number of panelists who answered "styled easily"/"styled moderately"/"not styled" are shown in this order.

[0085]

"Absence of a feeling of a hairstyling agent presence after drying"

The tress was treated by the same method as the "Drying speed immediately after application" and allowed to stand for 3 minutes after hand combing was completed. Subsequently, the hairstyling agent on the tress for evaluation, particularly the absence of feeling of a polymer presence, was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "feeling of a presence is absent"/"not either"/"feeling of a presence is present" when the tress was treated by the above procedure using each composition. The number of panelists who answered "feeling of a presence is absent"/"not either"/"feeling of a presence is present" are shown in this order.

[0086]

"Goodness in finger running after drying"

The tress was treated by the same method as the "Drying speed immediately after application" and allowed to stand for 3 minutes after hand combing was completed. Subsequently, the finger running through the tress for evaluation was evaluated on the following criteria.

The evaluation was carried out by letting seven panelists choose one from "good finger running"/"not either"/"poor finger running" when the tress was treated by the above procedure using each composition. The number of panelists who answered "good finger running"/"not either"/"poor finger running" are shown in this order.

[0087]

[Table 2]

	(Mass%)	Examples						Comparative Examples					
		1	2	3	4	5	6	1	2	3	4	5	6
(A)	Polysilicone-9 (*1)	3	3	3	-	-	-	3	3	-	-	3	3
	Polyvinylpyrrolidone	-	-	-	3	3	3	-	-	3	3	-	-
	(Bisobutyl PEG-15/amodimethicone) copolymer (*2)	-	0.3	-	-	-	-	-	-	-	-	-	-
	Ethanol	67	66.5	67	67	87	47	97	67	27	7	67	36.4
(B')	Water	-	-	-	-	-	-	-	30	-	-	-	-
(C)	Hydrogenated polyisobutene (*3)	30	30	-	30	10	50	-	-	70	90	-	60.6
	Isononyl isononate	-	-	30	-	-	-	-	-	-	-	-	-
(C')	Hydrogenated polyisobutene (*4)	-	-	-	-	-	-	-	-	-	-	30	-
Other	Fragrance	-	0.2	-	-	-	-	-	-	-	-	-	-
Mass ratio	(B)/(C)	2.2	2.2	2.2	2.2	8.7	0.9	-	-	0.4	0.1	2.2	0.6
Wettability evaluation	Hydrophobic film (mm ²)	3323	1892	3604	4819	1131	1071	451	245	Separated		Separated	
	Hydrophilic film (mm ²)	2790	3620	2943	3702	4616	2290	544	427	Separated		Separated	
Immediately after application	Drying speed	6/1/0	6/1/0	4/2/1	6/1/0	7/0/0	4/2/1	6/1/0	0/2/5	※	※	※	0/1/6
	Absence of friction	5/1/1	7/0/0	6/1/0	4/3/0	4/1/2	4/3/0	0/2/5	1/3/3	※	※	※	4/3/0
	Goodness in finger running	5/2/0	6/1/0	5/2/0	5/2/0	4/3/0	6/1/0	3/3/1	3/2/2	※	※	※	4/3/0
	Absence of stickiness when hand combing	7/0/0	6/1/0	4/3/0	3/3/1	3/2/2	4/2/1	1/1/5	2/2/3	※	※	※	2/1/4
After drying	Absence of bundling feeling	6/1/0	6/1/0	3/3/1	6/1/0	7/0/0	4/2/1	4/2/1	1/1/5	※	※	※	0/0/7
	Setting	5/2/0	6/1/0	7/0/0	4/3/0	3/4/0	4/3/0	1/2/4	2/1/4	※	※	※	5/2/0
	Absence of feeling of hairstyling agent presence	6/1/0	7/0/0	3/3/1	6/1/0	6/1/0	4/2/1	3/2/2	2/2/3	※	※	※	0/0/7
	Goodness in finger running	6/1/0	7/0/0	4/3/0	6/1/0	6/1/0	6/1/0	1/3/3	2/1/4	※	※	※	3/3/1

※ No evaluation tests were carried out because the composition was separated.

*1: Organopolysiloxane A described in Synthesis Example 1 of JP-A-2013-40162

*2: DOW CORNING TORAY SS-3588 (Dow Corning Toray Co., Ltd.)

*3: C₁₂ Compound, wherein, in formula (1), n=1, m=1=0, X=CH₂, R¹=R²=methyl group, R³=R⁸=H (PARLEAM 3; NOF CORPORATION)*4: C₂₄ Compound, wherein, in formula (1), n=4, m=1=0, X=CH₂, R¹=R²=methyl group, R³=R⁸=H (PARLEAM 6; NOF CORPORATION)

[0088]

[Examples 7 to 16]

The hair cosmetics described in Table 3 to which the component (D) was further added were prepared by a routine method, and high-temperature storage stability was evaluated. The evaluation was carried out by the following procedure.

[0089]

"High-temperature stability evaluation"

40 mL of the hair cosmetic shown in Table 3 was charged to a 50 mL glass bottle (standard wide mouth bottle PS-N0.6; Sansyo Co., Ltd.) and hermetically sealed with the lid on. The bottle was left to stand in a 50°C thermostatic chamber for 2 hours. Subsequently, the bottle was removed from the thermostatic chamber, and the state of hair cosmetic in the glass bottle was visually observed. The evaluation was carried out by the following criteria.

A: No separation

B: Clouded but returned to homogeneous solution when the temperature was returned to room temperature

C: Never returned to the homogeneous solution even after returning to room temperature and shaking the bottle

[0090]

[Table 3]

			(Mass%)													
			Examples													
(A)			7	8	9	10	11	12	13	14	15	16				
	Polysilicone-9 (*1)		3	3	3	3	3	3	3	3	3	3				
	(Bisobutyl PEG-15/amodimethicone) copolymer (*2)		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
(B)	Ethanol		66.5	65.5	66.0	66.0	65.5	66.0	66.0	66.0	66.0	66.2	66.2			
(C)	Hydrogenated polyisobutene (*3)		30	30	30	30	30	30	30	30	30	30	30			
(D)	Urea		-	0.33	0.17	0.5	1	-	-	-	-	-	-			
	Lactic acid		-	0.33	0.17	-	-	-	-	-	-	-	-			
	Glycerin		-	0.33	0.17	-	-	-	-	-	-	-	-			
	1,3-Butyleneglycol		-	-	-	-	-	0.5	-	-	-	-	-			
	Malic acid		-	-	-	-	-	-	0.5	-	-	-	-			
	Citric acid		-	-	-	-	-	-	-	-	0.5	-	-			
	PPG-10 Methyl glucose		-	-	-	-	-	-	-	-	-	0.3	-			
Other	PEG/PPG/polybutyleneglycol-8/5/3 glycerin		-	-	-	-	-	-	-	-	-	-	0.3			
	Fragrance		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
Mass ratio	(B)/(C)		2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2			
	High-temperature stability		B	A	A	A	A	A	A	A	A	A	A			

*1: Organopolysiloxane A described in Synthesis Example 1 of JP-A-2013-40162

*2: DOW CORNING TORAY SS-3588 (Dow Corning Toray Co., Ltd.)

*3: C₁₂ Compound of formula (1), wherein n=1, m=l=0, X=CH₂, R¹=R²=methyl group, R³=R⁸=H (PARLEAM 3; NOF CORPORATION)

[0091]

When Examples 7 to 16 of Table 3 were applied to the tress for evaluation, all of them dried immediately after application, did not cause, immediately after application, a friction feeling or stickiness but imparted a good finger running feel, did not cause, when the applied hair cosmetic dried, a bundling feeling but had a good setting and imparted a good finger running feel without a feeling of a hairstyling agent presence.

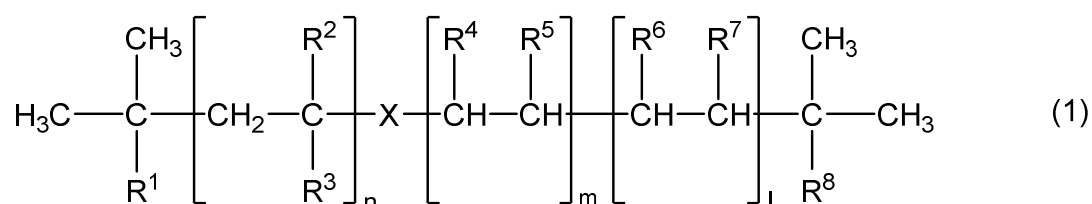
Claims

1. A hair cosmetic comprising the following components (A) to (C):

(A) hair cosmetic polymer having solubility or dispersibility in water or ethanol,

(B) C₁₋₄ monohydric alcohol, and

(C) C₉₋₂₁ liquid oil having represented by formula (1)



in the formula, R¹ to R⁸ each independently represent a hydrogen atom or a methyl group, X is -CH₂-, -COO-, or -CH₂COO-, n is 1 to 7, m is 0 to 2, l is 0 to 2, and n+m+l is 1 to 7, provided that any one of R⁴ to R⁷ is a methyl group when both m and l are 1 or more,

wherein content of the component (A) is 0.1 mass% or more and 10 mass% or less, and mass ratio of the component (B) to the component (C), (B)/(C), is 1.2 or more and 5 or less.

2. The hair cosmetic according to claim 1, wherein content of the component (B) is 45 mass% or more and 98 mass% or less.

3. The hair cosmetic according to claim 1 or 2, wherein content of the component (C) is 10 mass% or more and 52 mass% or less.

4. The hair cosmetic according to any one of claims 1 to 3, wherein content of water is less than 5 mass%.

5. The hair cosmetic according to any one of claims 1 to 4, wherein the component (A) is a film-forming polymer or a polyether-modified silicone.
6. The hair cosmetic according to any one of claims 1 to 5, wherein the component (C) is isododecane or hydrogenated polyisobutene.
7. The hair cosmetic according to any one of claims 1 to 6, wherein the component (B) is ethanol.
8. The hair cosmetic according to any one of claims 1 to 7, further comprising, as a component (D), one or two or more selected from the group consisting of polyols, urea, organic acids, polyoxyalkylene alkyl glucosides and polyoxyalkylene glyceryl ethers.
9. The hair cosmetic according to any one of claims 1 to 8, used in the form of mist.
10. The hair cosmetic according to claim 9, used as a non-aerosol type cosmetic.