



(51) International Patent Classification:

A61K 8/33 (2006.01) *A61K 8/60* (2006.01)
A61K 8/37 (2006.01) *A61K 8/73* (2006.01)
A61K 8/41 (2006.01) *A61Q 5/00* (2006.01)

(21) International Application Number:

PCT/CN2014/095132

(22) International Filing Date:

26 December 2014 (26.12.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant (for all designated States except AL):
L'OREAL [FR/FR]; 14, Rue Royale, F-75008 Paris (FR).

(72) Inventors; and

(71) Applicants (for AL only): **SHI, Xiaomei** [CN/CN]; 1028 Yunqiao Road, Shanghai (CN). **FELTIN, Charlotte** [FR/CN]; 1028 Yunqiao Road, Shanghai (CN). **JIA, Haidong** [CN/CN]; 1028 Yunqiao Road, Shanghai (CN).

(74) Agent: **CHINA PATENT AGENT (H.K.) LTD.**; 22/F, Great Eagle Centre, 23 Harbour Road, Wanchai, Hong Kong Special Administrative Region (CN).

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

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

Published:

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

(54) Title: COMPOSITION FOR CONDITIONING THE HAIR

(57) Abstract: A composition comprises at least one specific cationic surfactant, at least one ether, at least one fatty acid ester of glycerol and/or of polyglycerol, at least one alkyl(poly)glycoside nonionic surfactant, and at least one cellulose polysaccharide thickener.



COMPOSITION FOR CONDITIONING THE HAIR

FIELD OF THE INVENTION

The present invention relates to hair care cosmetic field, more specifically, it relates to a stable hair conditioning compositions having pleasant transparent appearance.

BACKGROUND OF THE INVENTION

In order to improve the cosmetic properties of the compositions for application to sensitized hair, i.e., hair which is damaged or weakened, in particular through the chemical action of environmental agents and/or of hair treatments such as permanent-waving, dyeing or bleaching, it is known to introduce into these compositions conditioning agents. The main purpose of these conditioning agents is to rectify or limit the undesirable effects induced by the various treatments or types of attach to which the hair fibers are more or less repeatedly subjected to and, of course, they can also improve the cosmetic behavior of natural hair.

The conditioning agents most commonly used to date are cationic polymers, silicones and/or silicone derivatives which impart to washed, dry or wet hair a disentangling, softness and a smoothness which are markedly enhanced in comparison to what can be obtained with corresponding compositions which do not contain them.

However these products do not have a pleasant appearance such as transparency due to the difficulties to incorporate or disperse silicones in the aqueous phase.

Efforts have been made to produce hair products which possess pleasant transparency, stable over time and which are able to provide the hair with a good conditioning effect. However, none of them are totally satisfying. Thus there is still a need for new composition displaying an improved stability as well as pleasant appearance without a detrimental effect on the conditioning property.

The present invention is directed towards meeting this need.

BRIEF DESCRIPTION OF THE INVENTION

An aim of the present invention is to obtain a composition, especially for conditioning keratin materials, especially the hair and/or scalp, which is stable and has a pleasant appearance, preferably a transparent appearance.

The aim of the present invention is achieved by a composition in the form of an emulsion comprising an aqueous phase and an oily phase and comprising at least one conditioning agent, at least one specific cationic surfactant, at least one ether, at least one fatty acid ester of glycerol and/or of polyglycerol, at least one alkyl(poly)glycoside nonionic surfactant, and at least

one cellulose polysaccharide thickener.

Preferably, the composition is silicone free. According to one embodiment, the composition is transparent or translucent.

Another aspect of the present invention is a process for conditioning keratin materials, especially hair and/or scalp, comprising the steps of applying to said keratin materials the composition of the present invention

Yet another aspect of the present invention relates to use of the composition of the present invention for conditioning keratin materials, especially hair and/or scalp.

Preferably, the "keratin material" according to the present invention is preferably hair and scalp.

As used herein, the term "silicone-free" means the composition of the present invention comprising no silicone or comprising silicone in an amount no more than 1% by weight of silicones relative to the total composition. Preferably, the composition may contain no more than 0.5% by weight, more preferably no more than 0.2% by weight, of silicones relative to the total weight of the composition.

More preferably, the composition of the present invention does not contain silicone.

The transparency may be measured by measuring the transmittance with absorption spectrometer in the visible region (for example, transparency was measured with a V-550 (JASCO) with a 10 mm width cell as an average of visible light transmittance (between 400 and 800 nm). The measurement is taken on the undiluted composition. The blank is determined with distilled water.

The composition according to the present invention may preferably have a transmittance greater than 80%, preferably greater than 85%, more preferably greater than 90%, using the visible light with a wavelength of 700 nm.

According to a preferred embodiment of the invention, the composition is in the form of a micro or nanoemulsion.

The "micro-emulsion" may be defined in two ways, namely, in a broader sense and in a narrower sense. That is to say, there are one case ("microemulsion in the narrow sense") in which the microemulsion refers to a thermodynamically stable isotropic single liquid phase containing a ternary system having at least one oily component, an aqueous component and two surfactants, and the other case ("micro-emulsion in the broad sense") in which among thermodynamically unstable typical emulsion systems the microemulsion additionally includes those such emulsions presenting transparent or translucent appearances due to their smaller

particle sizes (Satoshi Tomomasa, et al., Oil Chemistry, Vol. 37, No. 11 (1988), pp. 48-53). The "micro-emulsion" as used herein refers to a "micro-emulsion in the narrow sense," i.e., a thermodynamically stable isotropic single liquid phase.

The micro-emulsion refers to either one state of an O/W (oil-in-water) type microemulsion in which oil is solubilized by micelles, a W/O (water-in-oil) type microemulsion in which water is solubilized by reverse micelles, or a bicontinuous microemulsion in which the number of associations of surfactant molecules are rendered infinite so that both the aqueous phase and oil phase have a continuous structure.

The "nano-emulsion" here means an emulsion characterized by a dispersed phase with a size of less than 350 nm, the dispersed phase being stabilized by a crown of the (b) nonionic surfactant that may optionally form a liquid crystal phase of lamellar type, at the dispersed phase/continuous phase interface. In the absence of specific opacifiers, the transparency of the nano-emulsions arises from the small size of the dispersed phase, this small size being obtained by virtue of the use of mechanical energy and especially a high-pressure homogenizer.

Nanoemulsions can be distinguished from microemulsions by their structure. Specifically, micro-emulsions are thermodynamically stable dispersions formed from, for example, the (b) nonionic surfactant micells swollen with the (a) oil. Furthermore, microemulsions do not require substantial mechanical energy in order to be prepared.

The composition according to the present invention may be in the form of an O/W nano- or micro-emulsion, a W/O nano- or micro-emulsion or a bicontinuous emulsion.

The composition according to the present invention is preferably in the form of an oil-in-water nano- or micro-emulsion.

According to this embodiment, the oil phase is in the form of a droplet or globule with a median particle size by volume Dv_{50} of 300 nm or less, preferably from 10 nm to 180 nm, and more preferably 20 nm to 150 nm.

The median particle size by volume Dv_{50} is a parameter for particle size distribution, referring to the maximum particle diameter below which 50% of the sample volume exists (see in A Basic Guide To Particle Characterization, page 10).

The mean size by volume of the droplets of aqueous phase is measured using a Malvern Nano ZS 90 particle sizer (sold by Malvern Instruments). These measurements are carried out on the composition of the present invention (diluted). A computer program makes it possible to obtain the median particle size by volume Dv_{50} (see Zetasizer Nano Series User Manual, Malvern Instruments, MAN0317 Issue 2.1 July 2004).

The median particle size by volume Dv50 of the droplets of aqueous phase of the composition of the invention is 300 nm or less, preferably from 10 nm to 180 nm, and more preferably 20 nm to 150 nm.

The composition according to the present invention can have a transparent or translucent appearance, preferably a transparent appearance.

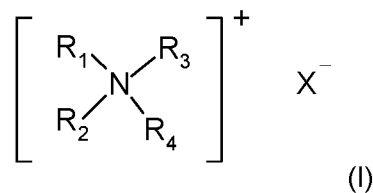
In the description, the terms "at least a" or "at least one" are equivalent to "one or more".

Other characteristics and advantages of the invention will emerge more clearly on reading the description and the examples that follow.

DETAILED DESCRIPTION OF THE INVENTION

Cationic surfactants

The composition of the present invention comprises at least one cationic surfactant. The cationic surfactant is chosen from the compound of formula (I),



in which,

R₁ to R₄, which may be identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms or an aromatic group such as aryl or alkylaryl, and at least one of the groups R₁ to R₄ comprising from 8 to 30 carbon atoms.

More preferably, at least one of the groups R₁ to R₄ comprises from 12 to 24 carbon atoms.

The aliphatic groups may comprise heteroatoms such as, in particular, oxygen, nitrogen, sulfur and halogens.

The aliphatic groups are chosen, for example, from C₁-C₃₀ alkyl, C₁-C₃₀ alkenyl, C₁-C₃₀ alkoxy, polyoxy(C₂-C₆)alkylene, C₁-C₃₀ alkylamide, (C₁₂-C₂₂)alkylamido(C₂-C₆)alkyl, (C₁₂-C₂₂)alkylacetate, C₁-C₃₀ hydroxyalkyl.

X⁻ is an anionic counterion chosen from halides.

Among the quaternary ammonium salts of formula (I), preference is given firstly to tetraalkylammonium halides such as tetraalkylammonium chlorides, for instance tetraalkylammonium or alkyltrimethylammonium halides such as dialkyldimethylammonium or

alkyltrimethylammonium chlorides in which the alkyl group contains from approximately 12 to 22 carbon atoms, in particular halides such as behenyltrimethylammonium chloride, distearyldimethylammonium chloride, cetyltrimethylammonium chloride, benzyldimethylstearyl ammonium chloride, hydroxyethyl oleyldimethylammonium chloride, or
5 else, and palmitylamidopropyltrimethylammonium halide, such as the chloride or stearamidopropyldimethyl(myristyl acetate) ammonium chloride.

Mentions may be made of the products, for example, sold under the name Dehyquart A OR by Cognis (INCI name: Cetrimonium chloride), products sold under the name Chimexane CL by the company Chimex (INCI name: hydroxyl oleyldimonium chloride), products sold
10 under the name Fentacare® 2232 EF by the company Rhodia (INCI name: behentrimonium chloride), or a mixture thereof.

More particularly, according to one embodiment of the invention, the cationic surfactant is present in an amount ranging from 0.01% to 10% by weight, preferably 0.05% to 5% by weight, relative to the total weight of the composition.

Ether useful in the composition of the invention

The composition of the present invention comprises at least one ether of formula (II),



In the formula (II):

20 R_5 and R_6 , which may be identical or different, denote a linear or branched C_6 - C_{25} alkyl or alkenyl radical.

Preferably, the ether of formula (II) is chosen from compounds for which the radicals R_5 and R_6 , which may be identical or different, denote a linear or branched C_6 - C_{12} alkyl or alkenyl radical.

25 More particularly, according to the present invention, the radicals R_5 and R_6 are identical.

In accordance with one particular embodiment of the invention, the preferred dialkyl ether is chosen from di-n-hexyl ether, di-n-heptyl ether, di-n-octyl ether, di-n-nonyl ether, di-n-decyl ether, di-isodecyl ether, di-n-dodecyl ether, di-n-eteradecyl ether, di-n-hexadecyl ether, di-n-oxadecyl ether, or a mixture thereof.

30 R_5 and R_6 preferentially denote a C_8 radical.

These compounds may be prepared according to the process described in patent application DE 41 27 230.

Most preferably, the ether of formula (II) is di-n-octyl ether (INCI name: dicaprylyl ether).

Such product is commercially available, for example those sold under the name Cetiol OE by the company Cognis (BASF), or Rofetan OE by the company Ecogreen Oleochemicals.

The ether of formula (II) is present in the composition according to the invention in an amount generally ranging from 0.01% to 15% by weight, preferably from 0.1% to 10% by weight, more preferably from 0.5% to 5% by weight, relative to the weight of the composition.

Fatty acid esters of glycerol and/or of polyglycerol

According to the invention, the composition comprises at least one fatty acid ester of glycerol and/or of polyglycerol.

According to a preferred embodiment, the fatty acid ester(s) of polyglycerol is (are) chosen from esters resulting from the reaction of polyglycerol comprising from 2 to 12 glycerol units, preferably from 3 to 10 glycerol units, and of at least one fatty acid containing from 8 to 24 carbon atoms, preferably from 8 to 20 carbon atoms, better still from 10 to 18 carbon atoms. The fatty acids containing from 8 to 24 carbon atoms may be linear or branched, and saturated or unsaturated.

The fatty acids may be chosen from oleic acid, stearic acid, isostearic acid, lauric acid, palmitic acid, myristic acid, linoleic acid, capric acid and caprylic acid, or mixtures thereof.

The fatty acid esters of polyglycerol can be chosen from monoesters, diesters, triesters and tetraesters, polyesters and mixtures thereof. Use is preferably made of esters with a low degree of esterification, for instance fatty acid monoesters, diesters or triesters of polyglycerol, or a mixture. The fatty acid ester of polyglycerol can be in the form of a mixture of esters with a low degree of esterification, for instance a mixture of monoester and diester or a mixture of monoester, diester and triester.

According to one embodiment, the fatty acid ester of polyglycerol is chosen from esters resulting from the reaction of polyglycerol comprising from 3 to 10 glycerol units and of at least one fatty acid containing from 8 to 20 carbon atoms, preferably from 10 to 18 carbon atoms, such as oleic acid or linoleic acid.

Mention may in particular be made of polyglyceryl-2 distearate, in particular as sold by NIHON EMULSION under the name Emalex PGSA; polyglyceryl-10 decastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-1810S; glyceryl oleate, in particular as sold by COGNIS under the name Monomuls 90-O 18;

glyceryl stearate, in particular as sold by COGNIS under the name Cutina GMS V; polyglyceryl-5 hexastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft A-186E; polyglyceryl-10 pentaoleate, in particular as sold by TAIYO KAGAKU under the name

Sunsoft Q-175S; polyglyceryl-10 pentastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-185S; glyceryl caprylate/caprates, in particular as sold by STEPAN under the name Stepan Mild GCC; polyglyceryl-10 heptaoleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-177S; polyglyceryl-4 isostearate, in particular as sold by
5 EVONIK GOLDSCHMIDT under the name Isolan GI 34; diisostearoyl polyglyceryl-3 dimer dilinoleate, in particular as sold by EVONIK GOLDSCHMIDT under the name Isolan PDI; glyceryl laurate, in particular as sold by COGNIS under the name Monomuls 90-L 12; polyglyceryl-5 trioleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft A-173E; polyglyceryl-2 oleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft
10 Q-17B; polyglyceryl-5 trimyristate, in particular as sold by TAIYO KAGAKU under the name Sunsoft A-143E;

mention may in particular be made of polyglyceryl-2 caprylate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-81B; polyglyceryl-2 laurate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-12D.

15 According to one particular embodiment, the fatty acid which is suitable for the reaction with the ester(s) of polyglycerol comprises at least one hydroxyl group. This is the case for ricinoleic acid.

Mention may in particular be made of polyglyceryl-3 ricinoleate (and) sorbitan isostearate, in particular as sold by CRODA under the name Arlacel 1690. polyglyceryl-3 ricinoleate, in
20 particular as sold by AARHUSKARLSHAMN under the name Akoline PGPR.

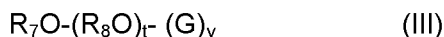
According to another embodiment, the fatty acid which is suitable for the reaction with the ester(s) of polyglycerol is a polyacid comprising at least one hydroxyl group. Thus, according to one variant of the invention, the hydrophobic surfactant comprises at least one polyglyceryl polyricinoleate which is an ester resulting from the esterification of one or more polyglycerols
25 with at least one polyricinoleic acid.

The fatty acid ester(s) useful in the composition of the invention is ranging from 0.01% to 5% by weight, preferably from 0.1% to 2% by weight, relative to the total weight of the composition.

Alkyl(poly)glycoside nonionic surfactant(s)

30 The term "alkyl(poly)glycoside" denotes an alkylpolyglycoside or an alkylmonoglycoside, also referred to in the present patent application as an alkylglycoside, which may be alkoxylated with one or more alkylene oxide groups, preferentially of C₂-C₄.

The alkyl(poly)glycoside nonionic surfactant(s) used, alone or as mixtures, in accordance with the present invention may be represented by formula (III) below:



in which:

R_7 represents a linear or branched, saturated or unsaturated alkyl group, containing from about 8 to 24 carbon atoms, or an alkyl phenyl group in which the linear or branched alkyl radical contains from 8 to 24 carbon atoms,

R_8 represents an alkylene group containing from about 2 to 4 carbon atoms,

G represents a saccharide unit containing 5 or 6 carbon atoms,

t denotes a value ranging from 0 to 10 and preferably from 0 to 4, and

v denotes a value ranging from 1 to 15.

Preferably, the alkyl(poly)glycoside nonionic surfactant(s) correspond to formula (III) in which:

R_7 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose, fructose or galactose, preferably glucose,

t denotes a value ranging from 0 to 3, and is preferably equal to 0,

and R_8 and v are as defined previously.

The degree of polymerization of the alkyl(poly)glycoside nonionic surfactant(s) as represented, for example, by the index v in formula (IV) ranges on average from 1 to 15 and preferably from 1 to 4. This degree of polymerization more particularly ranges from 1 to 2 and better still from 1.1 to 1.5, on average.

The glycoside bonds between the saccharide units are 1,6- or 1,4- bonds; preferably 1,4- bonds.

The compounds of formula (III) that may be used in the present invention are especially represented by the products sold by the company Cognis under the names Plantaren[®] (600 CS/U, 1200 and 2000) or Plantacare[®] (818, 1200 and 2000). It is also possible to use the products sold by the company SEPPIC under the names Triton CG 110 (or Oramix CG 110) and Triton CG 312 (or Oramix[®] NS 10), the products sold by the company BASF under the name Lutensol GD 70, or those sold by the company Chem Y under the name AG10 LK.

It is also possible, for example, to use the 1,4- (C_8 - C_{16})alkylpolyglucoside as an aqueous solution at 53% by weight relative to the total weight of the solution, sold by Cognis under the reference Plantacare[®] 818 UP.

Among all these alkyl(poly)glycoside nonionic surfactants, the decylglucoside (INCI: Decyl glucoside) sold by Cognis under the reference Plantacare[®] 2000 UP is preferably used.

The nonionic surfactant(s) are present in amounts preferably ranging from 0.01% to 10% by weight, in particular from 0.1% to 5% by weight and better still from 0.5% to 2% by weight relative to the total weight of the composition.

Cellulose polysaccharide thickener

5 The term "thickener" is understood to mean, within the meaning of the invention, a compound capable, by its presence, of increasing the viscosity of the medium by at least 50 cPs at 25°C and at a shear rate of 1 s⁻¹. Preferably, the thickening agent, at 1% in water or a 50/50 by weight water/alcohol mixture, exhibits a viscosity at 25°C and at a shear rate of 1 s⁻¹ of greater than 100 cPs.

10 These viscosities can be measured using in particular viscometers or rheometers having cone/plate geometry.

Cellulose polysaccharide thickeners are polymers which exhibit cellulose as base backbone.

15 Cellulose is a β-1,4-polyacetal of cellobiose, cellobiose being a disaccharide composed of two glucose molecules.

The celluloses which can be used in the compositions according to the present invention are preferably nonionic celluloses with or without hydrophobic chains.

20 Preferably, the celluloses used according to the invention are nonionic cellulose ethers, preferably nonionic hydroxyalkylcelluloses such as hydroxyethylcelluloses, hydroxypropylcelluloses, or hydroxypropylmethylcelluloses. A particularly suitable hydroxyethylcellulose is Natrosol® 250 MR sold by the company Ashland, and a most suitable hydroxypropylmethylcellulose is Methocel F4M, provided by Dow Chemicals (INCI name: Hydroxypropylmethylcellulose).

25 The celluloses modified by groups comprising one or more hydrophobic chains which can be used according to the present invention are in particular hydrophobically-modified hydroxyalkylcelluloses such as hydrophobically modified hydroxyethylcelluloses, preferably nonionic hydroxyethylcelluloses, modified by groups comprising at least one fatty chain, such as alkyl, arylalkyl or alkylaryl groups, or their mixtures, and in which the alkyl groups are preferably C₈-C₂₂ alkyl groups, such as the product Natrosol Plus Grade 330 CS® (C₁₆ alkyls) sold by Aqualon, corresponding to the INCI name Cetylhydroxyethylcellulose, or the product Bermocoll EHM 100®, sold by Berol Nobel,

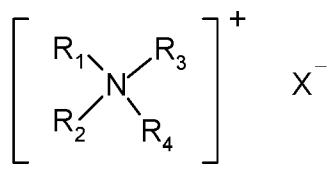
30 - those modified by alkylphenyl polyalkylene glycol ether groups, such as the product Amercell Polymer HM-1500® (nonylphenyl polyethylene glycol (15) ether) sold by Amerchol,

corresponding to the INCI name Nonoxynyl hydroxyethylcellulose.

The concentration of cellulose polysaccharide thickeners used in the compositions according to the present invention ranges from 0.05% to 10% by weight, preferably from 0.1% to 5% by weight and more preferably still from 0.5 to 3% by weight, relative to the total weight of the composition.

According to a preferred embodiment, the present invention relates to a composition in form of a micro- or nano- emulsion, with an aqueous phase and an oily phase comprising, by weight relative to the total weight of the composition:

A) from 0.05% to 5% by weight of at least one cationic surfactant of formula (I),



wherein:

R_1 to R_4 , identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, and at least one of the groups R_1 to R_4 comprising from 12 to 24 carbon atoms, and

X^- is chloride;

B) from 0.5% to 5% by weight of at least one ether of formula (II)

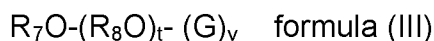


in which:

R_5 and R_6 are identical to each other, and denote C_6 - C_{12} alkyl or alkenyl radicals;

C) from 0.01% to 5% by weight of glyceryl oleate;

D) from 0.01% to 10% by weight of at least one alkyl(poly)glycoside nonionic surfactant of formula (III),



formula (III) wherein:

R_7 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose,

t denotes a value ranging from 0 to 3, and is preferably equal to 0; and

E) from 0.5 to 3% by weight of at least one hydroxyethylcellulose.

oily phase

The composition according to the present invention comprises an oily phase.

Preferably, the oily phase of the present invention is a dispersed phase, more preferably in the form of oil droplets or globules.

5 More preferably the median particle size by volume Dv50 of the oil droplets or globules is less than 300 nm, preferably from 10 nm to 180 nm, and more preferably 20 nm to 150 nm.

The oily phase of the present invention comprises at least one oil.

The term "oil" means any fatty substance that is in liquid form at room temperature (20-25°C) and at atmospheric pressure (760 mmHg).

10 The oil included in the oily phase suitable for preparing the compositions according to the invention may comprise hydrocarbon-based oils, silicone oils, fluoro oils or non-fluoro oils, or mixtures thereof.

According to a preferred embodiment, the composition of the present invention comprises hydrocarbon-based oils. The oils may be volatile or non-volatile.

15 The term "non-volatile oil" means oil that remains on the keratin materials at room temperature (20-25°C) and atmospheric pressure (760 mmHg). More specifically, non-volatile oil has an evaporation rate strictly less than 0.01 mg/cm²/min.

To measure this evaporation rate, 15 g of oil or of oil mixture to be tested are placed in a crystallizing dish 7 cm in diameter, which is placed on a balance in a large chamber of about 0.3 m³ that is temperature-regulated, at a temperature of 25°C, and hygrometry-regulated, at a relative humidity of 50%. The liquid is allowed to evaporate freely, without stirring it, while providing ventilation by means of a fan (Papst-Motoren, reference 8550 N, rotating at 2700 rpm) placed in a vertical position above the crystallizing dish containing said oil or said oil mixture, the blades being directed towards the crystallizing dish, 20 cm away from the bottom of the crystallizing dish. The mass of said oil or oil mixture remaining in the crystallizing dish is measured at regular intervals. The evaporation rates are expressed in mg of oil evaporated per unit of area (cm²) and per unit of time (minute).

25 The term "volatile oil" means any non-aqueous medium that is capable of evaporating on contact with the keratin materials in less than one hour, at room temperature (20-25°C) and atmospheric pressure (760 mmHg). The volatile oil is a cosmetic volatile oil, which is liquid at room temperature. More specifically, a volatile oil has an evaporation rate of between 0.01 and 200 mg/cm²/min, limits included.

30 According to the invention, when the composition is in the form of an oil-in water emulsion, the amount of the oily phase is from 0.1% to 15%, preferably from 0.5% to 5% in weight based

on the total weight of the composition.

Aqueous phase

The composition according to the invention comprises at least one aqueous phase.

The aqueous phase contain water and can contain water-miscible organic solvents (at room temperature of 20-25°C).

The aqueous phase according to the present invention is preferably the continuous phase of the emulsion (oil-in water emulsion).

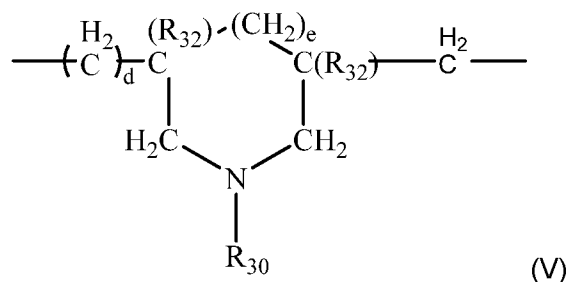
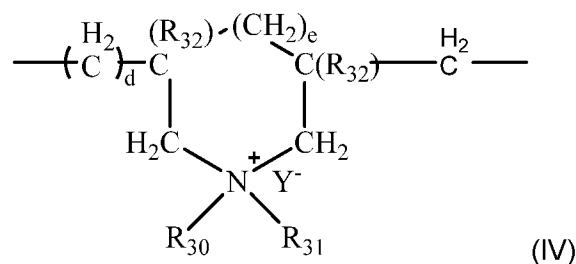
According to this embodiment, the amount of the aqueous phase in the composition of the invention is from 85% to 99.9%, preferably from 85% to 99%, in weight based on the total weight of the composition.

The compositions according to the invention may naturally contain, in addition, all the standard adjuvants encountered in the field of compositions for conditioning hair, such as, for example, perfumes, preservatives, sequestering agents, additional thickeners, additional conditioning agents, additional conditioning polymers, hydrating agents, vitamins, sunscreen agents, suspending agents and the like.

As additional conditioning agents or additional conditioning polymers which are useful to the present invention, mentions may be made of:

- Cationic alkyldiallylamine or dialkyldiallylammonium cyclopolymer

The said cationic cyclopolymer may be a homopolymer or copolymer containing, as main constituent of the chain, units corresponding to formula (IV) or (V):



in which formula d and e are equal to 0 or 1, the sum $d + e$ being equal to 1; R_{32} denotes a

hydrogen atom or a methyl radical; R_{30} and R_{31} , independently of each other, denote a C_1 - C_8 alkyl group, a hydroxyalkyl group in which the alkyl group is C_1 - C_5 , an amidoalkyl group in which the alkyl is C_1 - C_4 ; R_{30} and R_{31} can also denote, together with the nitrogen atom to which they are attached, a heterocyclic group such as piperidyl or morpholinyl; R_{30} and R_{31} , independently of each other, preferably denote a C_1 - C_4 alkyl group; Y^- is an organic or mineral anion such as bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate or phosphate. These polymers are described in particular in FR 2 080 759 and FR 2 190 406.

Among the polymers defined above, mention may be made more particularly of the dimethyldiallylammonium chloride homopolymer sold under the name "Merquat® 100" (INCI name polyquaternium 6) by the company Nalco (and its homologues of low weight-average molecular mass) and the copolymers of diallyldimethylammonium chloride and of acrylamide, sold under the name Merquat® 550;

- Plant oils; such as sweet almond oil, apricot kernel oil, argan oil, babassu oil, avocado oil, groundnut oil, candlenut oil, camellia oil, camelina oil, safflower oil, beauty-leaf oil, rapeseed oil, coconut oil, coriander oil, marrow oil, wheatgerm oil, jojoba oil, linseed oil, macadamia oil, corn germ oil, hazelnut oil, walnut oil, vernonia oil, olive oil, evening primrose oil, palm oil, passion flower oil, grapeseed oil, pracaxi oil, rose oil, castor oil, rye oil, sesame oil, rice bran oil, soybean oil, tamanu oil, and sunflower oil.

Among the plant oils, preferably coconut oil is used.

The composition of the present invention possesses an improved conditioning effect to the hair after application, when these additional conditioning agents or additional conditioning polymers are present.

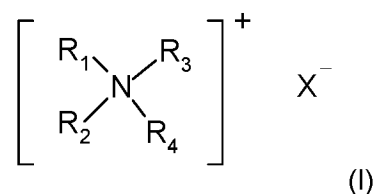
More preferably, the composition of the present invention allows a cosmetic composition with an improved hair conditioning effect, which having a pleasant transparent or translucent appearance, when additional conditioning agents or additional conditioning polymers are present, preferably when dimethyldiallylammonium chloride homopolymer, coconut oil, or a mixture thereof is present.

According to one embodiment, the composition of the present invention comprises, if present, additional conditioning agents or additional conditioning polymers, in a total amount of less than or equal to 10% by weight, relative to the total weight of the composition, preferably less than or equal to 5% by weight, relative to the total weight of the composition. More preferably, if present, the composition of the invention comprises from 0.01% to 1% by weight of the additional conditioning agents or additional conditioning polymers, relative to the total weight of the composition.

The composition according to the invention may take the form of thickened liquid, creams or gel. It is preferable that the composition according to the present invention be in the form of an nano- or micro-emulsion, more particularly oil-in-water nano- or micro-emulsion.

According to a preferred embodiment, the composition according the present invention is a composition in form of a micro- or nano- emulsion, comprising, by weight relative to the total weight of the composition:

- A) from 0.05% to 5% by weight of at least one cationic surfactant of formula (I),



wherein:

R_1 to R_4 , identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, and at least one of the groups R_1 to R_4 comprising from 12 to 24 carbon atoms, and

X^- is chloride;

- B) from 0.5% to 5% by weight of at least one ether of formula (II)

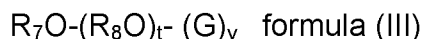


in which

R_5 and R_6 are identical to each other, and denote C_6 - C_{12} alkyl or alkenyl radicals;

- C) from 0.01% to 5% by weight of glyceryl oleate;

- D) from 0.01% to 10% by weight of at least one alkyl(poly)glycoside nonionic surfactant of formula (III),



formula (III) wherein:

R_7 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose,

t denotes a value ranging from 0 to 3, and is preferably equal to 0; and

- E) from 0.5 to 3% by weight of at least one hydroxyethylcellulose.

Another aspect of the invention is a process for conditioning keratin materials, especially hair and/or scalp, comprising the steps of applying to said keratin materials the composition described above.

More specifically, the aspect of the invention is a process for conditioning keratin materials, especially hair and scalp, comprising the steps of applying to said keratin materials the composition described above, and optionally massaging the keratin materials.

More specifically, the aspect of the invention is a process for conditioning keratin materials, especially hair and scalp, comprising the steps of applying to said keratin materials the composition described above, and optionally combing the keratin materials.

Optionally, a step of washing the composition as mentioned above from the keratin materials is followed.

Yet another aspect of the present invention is the use of the above composition of the invention for conditioning keratin materials, especially hair and/or scalp.

Non limiting examples illustrating the invention are given.

EXAMPLES

Five hair conditioners were prepared, two according to the invention (Invention A and B) and three comparative (Comparative C, D, E):

(chemical and/or INCI name)	Invention A (% by weight, by active ingredient)	Invention B (% by weight, by active ingredient)	Comparative C (% by weight, by active ingredient)	Comparative D (% by weight, by active ingredient)	Comparative E (% by weight, by active ingredient)
Hydroxyethylcellulose	1.00	1.00	0	1.00	1.00
Cetrimonium chloride	0.20	0.20	0.20	0.20	0.20
Hydroxyethyl oleyldimonium	0.20	0.20	0.20	0.20	0.20

chloride					
Behentrimonium chloride	0.10	0.10	0.10	0.10	0.10
Glycerin	5.00	5.00	5.00	5.00	5.00
Polyquaternium-6 (Merquat® 100 from Nalco)	0.40	0	0.40	0.40	0.40
Alcohol	4.00	4.00	4.00	4.00	4.00
Decyl glucoside	1.00	1.00	1.00	0	1.00
Glyceryl oleate	0.60	0.60	0.60	0.60	0
Dicarpryl Ether (Cetiol® OE from Cognis (BASF))	2.00	2.00	2.00	2.00	2.00
Coconut oil	0.20	0	0.20	0.20	0.20
Preservative	1.00	1.00	1.00	1.00	1.00
Ethylhexylglycerin	0.40	0.40	0.40	0.40	0.40
Fragrance	0.50	0.50	0.50	0.50	0.50
WATER	Qs to 100	Qs to 100	Qs to 100	Qs to 100	Qs to 100

Comparative C doesn't contain hydroxyethylcellulose thickener; Comparative D doesn't contain Decyl glucoside; and

Comparative E doesn't contain Glyceryl oleate.

5 The invention A and B, comparative C, D and E were prepared according to the conventional methods for preparing conditioning composition formulations.

The transparency of Invention A and B, and Comparative C, D and E were measured with a V-550 (JASCO) with a 10 mm width cell as an average of visible light transmittance (between 400 and 800 nm). The measurement was taken on the undiluted composition. The blank is determined with distilled water.

10 The particle size Dv50 of the Invention A and B, Comparative C, D, and E were measured according to the method described in the description.

The stability tests of the Invention A and B, Comparative C, D and E were carried out at 45 °C and 4 °C for 2 months.

	Stability at 45°C	Stability at 4°C	Transmittanc	Particle size
--	-------------------	------------------	--------------	---------------

			e (700 nm)	(Dv50)
Invention A	Stable	Stable	94.6%	24 nm
Invention B	Stable	Stable	94.3%	22 nm
Comparative C	Not stable, creaming after 2 weeks, appearance turned hazy	Stable	88.0%	23 nm
Comparative D	Not stable, creaming after 1 day	Not stable, creaming after 3 days	0.6%	>1000 nm
Comparative E	Not stable, creaming after 1 day	Not stable, creaming after 5 days	0	>1000 nm

It can be observed that, comparing to the Comparative C, D, and E, the Invention A and B possess an improved stability, and have a pleasant transparent appearance.

On the other hand, Comparative C is not stable at high temperature after 2 weeks, and
5 Comparative D and E are not stable and not transparent.

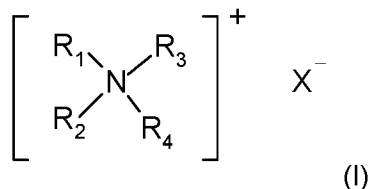
The Invention A and B both possess very good conditioning effect to the hair, when they are applied on the hair. Advantageously, Invention A has an improved conditioning effect due to the presence of additional conditioning agents or additional conditioning polymer.

CLAIMS

What is claimed is

1. A composition in the form of an emulsion comprising an aqueous phase and an oily phase, the composition comprising:

a) at least one cationic surfactant of formula (I),



wherein:

R₁ to R₄, identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, an aromatic group such as aryl or alkylaryl, at least one of the groups R₁ to R₄ comprising from 8 to 30 carbon atoms, and X⁻ is an anionic counterion chosen from halides;

b) at least one ether of formula (II)



in which

R₅ and R₆, identical or different, denote a linear or branched C₆-C₂₅ alkyl or alkenyl radical;

c) at least one fatty acid ester of glycerol and/or of polyglycerol;

d) at least one alkyl(poly)glycoside nonionic surfactant, and

e) at least one cellulose polysaccharide thickener.

2. Composition according to claim 1 being silicone free.

3. Composition according to claim 1 or 2 is in form of a micro- or nano-emulsion, more preferably oil-in-water emulsion comprising at least 50% of water in weight of composition weight.

4. Composition according to any of claims 1 to 3 wherein the emulsion is nano- or micro-emulsion.

5. Composition of any one of the preceding claims 1 to 4 is transparent or translucent.

6. Composition of any one of the preceding claims 1 to 5, wherein the cationic surfactant of the formula (I), at least one of the groups R_1 to R_4 comprising from 12 to 24 carbon atoms, and X^- is an chloride; preferably the cationic surfactant is chosen from behenyltrimethylammonium chloride, distearyltrimethylammonium chloride, cetyltrimethylammonium chloride, benzyldimethylstearyl ammonium chloride, hydroxyethyl oleyldimethylammonium chloride, or a mixture thereof.

7. Composition of any one of the preceding claims 1 to 6, wherein the cationic surfactant is present in an amount ranging from 0.01% to 10% by weight, preferably from 0.05% to 5% by weight, relative to the total weight of the composition.

8. Composition of any one of the claims 1 to 7, wherein the R_5 and R_6 of the formula (II) denotes, identical or different, a linear or branched C_6 - C_{12} alkyl or alkenyl radical; preferably, R_5 and R_6 are identical to each other, and denote C_6 - C_{12} alkyl or alkenyl radicals.

9. Composition of any one of the preceding claims 1 to 8, wherein the ether of formula (II) is chosen from di-n-hexyl ether, di-n-heptyl ether, di-n-octyl ether, di-n-nonyl ether, di-n-decyl ether, di-isodecyl ether, di-n-dodecyl ether, di-n-eteradecyl ether, di-n-hexadecyl ether, di-n-oxtadecyl ether, or a mixture thereof; preferably the ether is di-n-octyl ether.

10. Composition of any one of the preceding claims 1 to 9, wherein the ether of formula (II) is present in an amount ranging from 0.01% to 15% by weight, preferably from 0.1% to 10% by weight, more preferably from 0.5% to 5% by weight, relative to the total weight of the composition.

11. Composition of any one of the preceding claims 1 to 10, wherein the fatty acid ester of glycerol and/or of polyglycerol is chosen from esters resulting from the reaction of polyglycerol comprising from 3 to 10 glycerol units and of at least one fatty acid containing from 8 to 20 carbon atoms, preferably from 10 to 18 carbon atoms, or a mixture thereof; preferably the fatty acid ester is chose from polyglyceryl-2 distearate, polyglyceryl-10 decastearate, glyceryl oleate, glyceryl stearate,, polyglyceryl-5 hexastearate, polyglyceryl-10 pentaoleate, polyglyceryl-10 pentastearateglycerol caprylate/caprates, polyglyceryl-10 heptaoleate, polyglyceryl-4 isostearate, diisostearoyl polyglyceryl-3 dimer dilinoleate, glyceryl laurate, polyglyceryl-5 trioleate, polyglyceryl-2 oleate, polyglyceryl-5 trimyristate, polyglyceryl-2 caprylate, polyglyceryl-2 laurate, or a mixture thereof; more preferably, the fatty acid ester is glyceryl oleate.

12. Composition of any one of the preceding claims 1 to 11, wherein the fatty acid ester is present in the composition ranging from 0.01% to 5% by weight, preferably from 0.1% to 2% by weight, relative to the total weight of the composition.

13. Composition of any one of the preceding claims 1 to 12, wherein the alkyl(poly)glucoside nonionic surfactant is chosen from the compound of formula (III),



formula (III) wherein:

R_7 represents a linear or branched, saturated or unsaturated alkyl group, containing from about 8 to 24 carbon atoms, or an alkyl phenyl group in which the linear or branched alkyl radical contains from 8 to 24 carbon atoms,

R_8 represents an alkylene group containing from about 2 to 4 carbon atoms,

G represents a saccharide unit containing 5 or 6 carbon atoms,

t denotes a value ranging from 0 to 10 and preferably from 0 to 4, and

v denotes a value ranging from 1 to 15,

preferably,

R_7 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose,

t denotes a value ranging from 0 to 3, and is preferably equal to 0,

more preferably, the alkyl(poly)glucoside nonionic surfactant is decylglucoside.

14. Composition of any one of the preceding claims 1 to 13, wherein the alkyl(poly)glucoside nonionic surfactant is present in an amount ranging from 0.01% to 10% by weight, in particular from 0.1% to 5% by weight and better still from 0.5% to 2% by weight relative to the total weight of the composition.

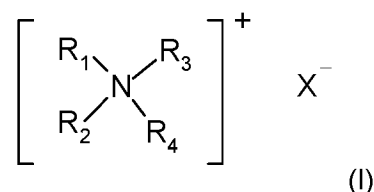
15. Composition of any one of the preceding claims 1 to 14, wherein the cellulose polysaccharide thickener is chosen from nonionic cellulose ethers, preferably chosen from hydroxyethylcellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose, or a mixture thereof, even more preferably the cellulose polysaccharide thickener is hydroxyethylcellulose.

16. Composition of any one of the preceding claims 1 to 15, wherein the cellulose polysaccharide thickener is present ranging from 0.05% to 10% by weight, preferably from

0.1% to 5% by weight and more preferably still from 0.5 to 3% by weight, relative to the total weight of the composition.

17. Composition according to any of the preceding claims 1 to 16 in form of a micro- or nano- emulsion, comprising, by weight relative to the total weight of the composition:

5 A) from 0.05% to 5% by weight of at least one cationic surfactant of formula (I),



wherein:

10 R_1 to R_4 , identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, and at least one of the groups R_1 to R_4 comprising from 12 to 24 carbon atoms, and

X^- is chloride;

B) from 0.5% to 5% by weight of at least one ether of formula (II)

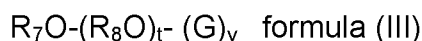


15 in which

R_5 and R_6 are identical to each other, and denote C_6 - C_{12} alkyl or alkenyl radicals;

C) from 0.01% to 5% by weight of glyceryl oleate;

D) from 0.01% to 10% by weight of at least one alkyl(poly)glycoside nonionic surfactant of formula (III),



20 formula (III) wherein:

R_7 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose,

25 t denotes a value ranging from 0 to 3, and is preferably equal to 0; and

E) from 0.5 to 3% by weight of at least one hydroxyethylcellulose.

18. Composition according to any of claims 1 to 17 comprising as conditioning agent a cationic polymer with a charger density higher than 4e/g.

19. A process for conditioning keratin materials, especially the hair and/or scalp, comprising the steps of applying to said keratin materials the composition of any one of the preceding claims 1 to 18, and then rinsing with water.

20. Use of the composition of any one of the preceding claims 1 to 18 for conditioning keratin materials, especially hair and/or scalp.

10

15

20

25

30

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2014/095132

A. CLASSIFICATION OF SUBJECT MATTER

A61K 8/33(2006.01)i; A61K 8/37(2006.01)i; A61K 8/41(2006.01)i; A61K 8/60(2006.01)i; A61K 8/73(2006.01)i; A61Q 5/00(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K; A61Q

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

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

Database:DWPI,CPRSABS,CNABS,CNTXT,CNKI; Keywords: polyglyceryl+, behentrimonium, glucoside, decyl, ether, cellulose, oleate, dicaprylyl, glyceryl+, cetrimonium, glyceryl, hair, transparent, translucent, micro-, nano-, OREA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014017185 A1 (MATTHIAS HLOUCHA ET AL.) 16 January 2014 (2014-01-16) see table 1 and paragraph [0002]	1-20
A	US 2014023606 A1 (HENKEL AG & CO. KGAA) 23 January 2014 (2014-01-23) see example 1	1-20
A	EP 2229932 A1 (COGNIS IP MAN GMBH) 22 September 2010 (2010-09-22) see table 1 example 1	1-20

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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

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

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

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

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

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

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

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

“&” document member of the same patent family

Date of the actual completion of the international search

15 September 2015

Date of mailing of the international search report

30 September 2015

Name and mailing address of the ISA/CN

STATE INTELLECTUAL PROPERTY OFFICE OF THE
P.R.CHINA
6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing
100088, China

Facsimile No. (86-10)62019451

Authorized officer

GUO, Yixin

Telephone No. (86-10)62089582

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2014/095132

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	2014017185	A1	16 January 2014	EP	2694014	A2	12 February 2014
				JP	2014517810	A	24 July 2014
				WO	2012130413	A2	04 October 2012
				WO	2012130413	A3	17 April 2014
				CN	103826600	A	28 May 2014
				KR	20140019427	A	14 February 2014
US	2014023606	A1	23 January 2014	WO	2012130655	A2	04 October 2012
				DE	102011015192	A1	27 September 2012
				WO	2012130655	A3	13 June 2013
				CN	103429219	A	04 December 2013
				JP	2014509610	A	21 April 2014
				EP	2688545	A2	29 January 2014
EP	2229932	A1	22 September 2010	None			