



(51) International Patent Classification:

A45D 7/02 (2006.01) *A61Q 5/04* (2006.01)
A61K 8/49 (2006.01) *A61Q 5/06* (2006.01)
A61Q 5/00 (2006.01)

(21) International Application Number:

PCT/JP2009/071732

(22) International Filing Date:

18 December 2009 (18.12.2009)

(25) Filing Language:

English

(26) Publication Language:

English

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

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DE BONI, Maxime** [FR/JP]; c/o NIHON L'OREAL K.K., KSP R&D-A1101, 3-2-1, Sakado, Takatsu-ku, Kawasaki-shi, Kanagawa 2130012 (JP). **TAKAHASHI, Hiroshi** [JP/JP]; c/o NIHON L'OREAL K.K., KSP R&D-A1101, 3-2-1, Sakado, Takatsu-ku, Kawasaki-shi, Kanagawa 2130012 (JP).

(74) Agents: **MURAYAMA, Yasuhiko** et al.; 1-9-2, Marunouchi, Chiyoda-ku, Tokyo 1006620 (JP).

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

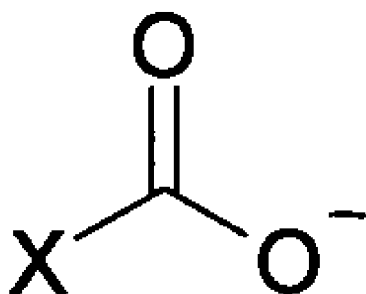
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,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

Published:

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

(54) Title: PROCESS FOR TREATING KERATIN FIBERS

(57) Abstract: The present invention relates to a process for treating keratin fibers comprising the steps of: applying onto the keratin fibers a composition comprising at least one UV filter; then placing the keratin fibers in an occlusive space; and then heating the keratin fibers, wherein the composition contains neither a reducing agent nor a source of carbonate ions of the formula: wherein X is a group selected from the group consisting of O⁻, OH, NH₂, O⁻ OH, and O-COO⁻. The present invention also relates to the composition itself and a kit to be used for the above process.



DESCRIPTION

PROCESS FOR TREATING KERATIN FIBERS

TECHNICAL FIELD

The present invention relates to a process for treating keratin fibers such as hair, as well as a composition and a kit to be used for the process.

BACKGROUND ART

Due to the many physical stresses (UV, shampoo, brushing, and the like) and chemical stresses (coloration, perm, relaxing, pollution, and the like) that keratin fibers such as hair must undergo daily, research for effectively repairing damaged keratin fibers has become important in the cosmetic treatments for keratin fibers.

Repairing damaged keratin fibers is worthwhile if a real sensation of return to the original state of the keratin fibers is perceived. Furthermore, the repairing treatment should be effective against various stresses, as mentioned before.

Technologies (compositions and/or processes) known as treatments for damaged keratin fibers that have been proposed are still insufficient insofar as they are often temporary and do not achieve proper recovery of keratin fiber integrity. In addition, there is still a strong interest in finding efficient protective systems for keratin fibers.

UV filters are widely used in skin care products and are known to be effective in the protection of the skin, which is sensitive to UV rays, against solar stresses and aggressions. For example, please refer to US-A-2005-166336.

The keratin fibers such as hair are also sensitive to UV rays. Therefore, there is a real need for compositions and processes that help prevention hair damage by UV rays.

DISCLOSURE OF INVENTION

Many compositions and processes using UV filters have been proposed for protecting keratin fibers from UV rays.

Nevertheless, they still need to be improved further, in terms of the protective ability of such compositions and processes.

Thus, an objective of the present invention is to provide a new treatment process for keratin fibers such as hair, using a UV filter, even with a relatively small amount thereof, which provides the keratin fibers with good cosmetic effects, in particular superior UV protecting effects as well as superior repairing or recovering effects, which can be effective against various stresses for a long time.

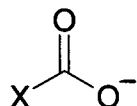
The above objective of the present invention can be achieved by a process for treating keratin fibers comprising the steps of: applying onto the keratin fibers a composition comprising at least one UV filter;

then placing the keratin fibers in an occlusive space; and

then heating the keratin fibers,

wherein

the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH , NH_2 , $\text{O}-\text{OH}$, and $\text{O}-\text{COO}^-$.

The above process may further comprise the step of rinsing the keratin fibers after the step of applying the composition onto the keratin fibers and/or after the step of heating the keratin fibers.

Mechanical tension may be provided to the keratin fibers. The mechanical tension may be provided by using at least one reshaping means selected from the group consisting of a curler, a roller, a plate and an iron.

The occlusive space may be formed by at least one coating means. The coating means may be rigid or flexible. The coating means may comprise at least one member selected from the group consisting of a film and a sheet.

In the above process, the keratin fibers may be heated at 45°C to 250°C during the step of heating the keratin fibers. The keratin

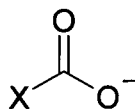
fibers may be heated by at least one heater providing at least one selected from the group consisting of hot air, hot steam, high frequency induction heating, microwave heating, infrared ray irradiation, laser, and flash lamp irradiation. The coating means and/or the reshaping means may comprise the heater.

The UV filter may be an organic UV filter. The UV filter may be selected from the group consisting of anthranilates; dibenzoylmethane derivatives; cinnamic derivatives; salicylic derivatives; camphor derivatives; benzophenone derivatives; β,β -diphenylacrylate derivatives; triazine derivatives; benzotriazole derivatives; benzalmalonate derivatives; benzimidazole derivatives; imidazolines; bis-benzoazolyl derivatives; p-aminobenzoic acid (PABA) derivatives; methylene bis(hydroxyphenylbenzotriazole) derivatives; benzoxazole derivatives; UV absorbing polymers; dimers derived from α -alkylstyrene; 4,4-diarylbutadienes; and mixtures thereof. In particular, the UV filter may be selected from the group consisting of ethylhexyl methoxycinnamate, homosalate, ethylhexyl salicylate, octocrylene, phenylbenzimidazole sulfonic acid, benzophenone-3, benzophenone-4, benzophenone-5, n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, 4-methylbenzylidene camphor, terephthalylidene dicamphor sulfonic acid, disodium phenyl dibenzimidazole tetrasulfonate, ethylhexyl triazone, bis-ethylhexyloxyphenol methoxyphenyl triazine, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(biphenyl-4-yl)-1,3,5-triazine, 2,4,6-tris(terphenyl)-1,3,5-triazine, methylene bis-benzotriazolyl tetramethylbutylphenol, drometrizole trisiloxane, polysilicone-15, dineopentyl 4'-methoxybenzalmalonate, 1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene, 2,4-bis[5-(dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-triazine, camphor benzylkonium methosulfate and mixtures thereof.

The composition may comprise the UV filter in an amount of 0.01 to 40% by weight relative to the total weight of the composition. The pH of the composition may range from 6 to 11.

Another aspect of the present invention is a composition for treating keratin fibers to be heated in an occlusive space, comprising at least one UV filter, wherein

the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH, NH_2 , O-OH, and $\text{O}-\text{COO}^-$.

The present invention also relates to a kit for treating keratin fibers, comprising:

a device comprising

at least one coating means to form an occlusive space, and

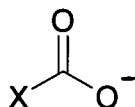
at least one heater to heat the keratin fibers in the occlusive space;

and

a composition comprising at least one UV filter,

wherein

the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH, NH_2 , O-OH, and $\text{O}-\text{COO}^-$.

BEST MODE FOR CARRYING OUT OF THE INVENTION

After diligent research, the inventors have discovered that it is possible to provide keratin fibers such as hair with good cosmetic effects, using a UV filter, and in particular superior UV protecting effects as well as superior repairing or recovering effects, which can be effective against various stresses for a long time, by using a composition comprising a UV filter in association with a specific heating process for the keratin fibers.

The above specific heating process is performed in a closed or occlusive environment, which limits the evaporation of water or moisture from the keratin fibers and maintains the keratin fibers at higher temperature preferably in the wet state. Accordingly, the keratin fibers can be evenly heated, and the UV filter can

easily penetrate into or deposit onto the keratin fibers such that it can remain in or on the keratin fibers for a long time even after some stresses such as shampooing.

Since a UV filter can easily stay on or in the keratin fibers, the process according to the present invention can exhibit good cosmetic effects by using even a relatively small amount of UV filter as compared to a conventional process in which it is difficult for a UV filter to stay on or in the keratin fibers.

The composition used in the present invention may not contain any reducing agents such as thiol-compounds. Therefore, malodor derived from the reducing agents can be prevented. Furthermore, the composition used in the present invention may not contain any carbonate ion source as defined above. Therefore, cosmetic treatment may be more effective, because there is no possibility of producing carbon dioxide which may form a foam that may inhibit the deposition or penetration of the UV filter on or into the keratin fibers.

(Composition)

The composition used for the present invention comprises at least one UV filter.

The term "UV" here comprises the UVB region (260-320nm in wavelength) and the UVA region (320-400nm in wavelength). Therefore, a UV filter means any material which has filtering effects in the wavelength of UV, in particular the UVA and UVB regions.

The UV filter may be an organic and/or inorganic UV filter active in the UV-A and/or UV-B region which is hydrophilic and/or lipophilic and/or properly insoluble in cosmetic solvents commonly used. It is preferable that the UV filter is an organic UV filter.

The hydrophilic, lipophilic or insoluble organic UV filter may be selected in particular from anthranilates; dibenzoylmethane derivatives; cinnamic derivatives; salicylic derivatives; camphor derivatives; benzophenone derivatives; β,β -diphenylacrylate derivatives; triazine derivatives; benzotriazole derivatives; benzalmalonate derivatives, in particular those cited in U.S. Pat. No. 5,624,663; benzimidazole derivatives; imidazolines; bis-benzoazolyl derivatives, such as described in EP-669,323 and U.S.

Pat. No. 2,463,264; p-aminobenzoic acid (PABA) derivatives; methylenebis(hydroxyphenylbenzotriazole) derivatives, such as described in U.S. Pat. Nos. 5,237,071, 5,166,355, GB-2,303,549, DE-197,26,184 and EP-893,119; benzoxazole derivatives, such as described in EP-0,832,642, EP-1,027,883, EP-1,300,137 and DE-10162844; screening polymers and screening silicones, such as those described in particular in WO 93/04665; dimers derived from α -alkylstyrene, such as those described in DE-19855649; 4,4-diarylbutadienes, such as described in EP-0,967,200, DE-19746654, DE-19755649, EP-A-1,008,586, EP-1,133,980 and EP-133,981; and their mixtures.

Mention may be made, as examples of organic UV filters, of those denoted below under their INCI names:

Para-Aminobenzoic acid derivatives: PABA, Ethyl PABA, Ethyl Dihydroxypropyl PABA, Ethylhexyl Dimethyl PABA, marketed in particular under the trademark "Escalol 507" by ISP, Glyceryl PABA, and PEG-25 PABA, marketed under the trademark "Uvinul P25" by BASF;

Dibenzoylmethane Derivatives: Butyl Methoxydibenzoylmethane, marketed in particular under the trademark "Parsol 1789" by Hoffmann-LaRoche, and Isopropyl Dibenzoylmethane;

Salicylic Derivatives: Homosalate, marketed under the trademark "Eusolex HMS" by Rona/EM Industries, Ethylhexyl Salicylate, marketed under the trademark "Neo Heliopan OS" by Haarmann and Reimer, Dipropyleneglycol Salicylate, marketed under the trademark "Dipsal" by Scher, and TEA Salicylate, marketed under the trademark "Neo Heliopan TS" by Haarmann and Reimer;

Cinnamic Derivatives: Ethylhexyl Methoxycinnamate, marketed in particular under the trademark "Parsol MCX" by Hoffmann-LaRoche, Isopropyl Methoxycinnamate, Isoamyl Methoxycinnamate, marketed under the trademark "Neo Heliopan E 1000" by Haarmann and Reimer, Cinoxate, DEA Methoxycinnamate, Diisopropyl Methylcinnamate, and Glyceryl Ethylhexanoate Dimethoxycinnamate;

β,β -Diphenylacrylate Derivatives: Octocrylene, marketed in particular under the trademark "Uvinul N539" by BASF, and Etocrylene, marketed in particular under the trademark "Uvinul N35" by BASF;

Benzophenone Derivatives: Benzophenone-1, marketed under the trademark "Uvinul 400" by BASF, Benzophenone-2, marketed under the trademark "Uvinul D50" by BASF, Benzophenone-3 or Oxybenzone, marketed under the trademark "Uvinul M40" by BASF, Benzophenone-4, marketed under the trademark "Uvinul MS40" by BASF, Benzophenone-5, Benzophenone-6, marketed under the trademark "Helisorb 11" by Norquay, Benzophenone-8, marketed under the trademark "Spectra-

Sorb UV-24" by American Cyanamid, Benzophenone-9, marketed under the trademark "Uvinul DS-49" by BASF, Benzophenone-12, and n-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate;

Benzylidenecamphor Derivatives: 3-Benzylidene camphor, manufactured under the trademark "Mexoryl SD" by Chimex, 4-Methylbenzylidene camphor, marketed under the trademark "Eusolex 6300" by Merck, Benzylidene Camphor Sulfonic Acid, manufactured under the trademark "Mexoryl SL" by Chimex, Camphor Benzalkonium Methosulfate, manufactured under the trademark "Mexoryl SO" by Chimex, Terephthalylidene Dicamphor Sulfonic Acid, manufactured under the trademark "Mexoryl SX" by Chimex, and Polyacrylamidomethyl Benzylidene Camphor, manufactured under the trademark "Mexoryl SW" by Chimex;

Phenylbenzimidazole Derivatives: Phenylbenzimidazole Sulfonic Acid, marketed in particular under the trademark "Eusolex 232" by Merck, and Disodium Phenyl Dibenzimidazole Tetrasulfonate, marketed under the trademark "Neo Heliopan AP" by Haarmann and Reimer;

Phenylbenzotriazole Derivatives: Drometrizole Trisiloxane, marketed under the trademark "Silatrizole" by Rhodia Chimie, and Methylene Bis-Benzotriazolyl Tetramethylbutylphenol, marketed in the solid form under the trademark "Mixxim BB/100" by Fairmount Chemical or in the micronized form in aqueous dispersion under the trademark "Tinosorb M" by Ciba Specialty Chemicals;

Triazine Derivatives: Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine, marketed under the trademark "Tinosorb S" by Ciba-Geigy, Ethylhexyl Triazone, marketed in particular under the trademark "Uvinul T150" by BASF, Diethylhexyl Butamido Triazone, marketed under the trademark "Uvasorb HEB" by Sigma 3V, 2,4,6-Tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, the symmetrical triazine screening agents described in U.S. Pat. No. 6,225,467, WO 2004/085412 (see compounds 6 and 9) or the document "Symmetrical Triazine Derivatives", IP.COM Journal, IP.COM INC, WEST HENRIETTA, NY, US (20 Sep. 2004), in particular the 2,4,6-tris(biphenyl)-1,3,5-triazines (especially 2,4,6-tris(biphenyl-4-yl)-1,3,5-triazine) and 2,4,6-tris(terphenyl)-1,3,5-triazine, which is taken up again in WO 06/035000, WO 06/034982, WO 06/034991, WO 06/035007, WO 2006/034992 and WO 2006/034985;

Anthranilic Derivatives: Menthyl anthranilate, marketed under the trademark "Neo Heliopan MA" by Haarmann and Reimer;

Imidazoline Derivatives: Ethylhexyl Dimethoxybenzylidene Dioxoimidazoline Propionate;

Benzalmalonate Derivatives: Dineopentyl 4'-methoxybenzalmalonate, and Polyorganosiloxane comprising benzalmalonate functional

groups, such as Polysilicone-15, marketed under the trademark "Parsol SLX" by Hoffmann-La Roche;
 4,4-Diarylbutadiene Derivatives: 1,1-Dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene; and
 Benzoxazole Derivatives: 2,4-bis[5-(dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-triazine, marketed under the trademark of Uvasorb K2A by Sigma 3V and their mixtures.

The preferred organic UV screening agents are selected from: Ethylhexyl Methoxycinnamate, Homosalate, Ethylhexyl Salicylate, Octocrylene, Phenylbenzimidazole Sulfonic Acid, Benzophenone-3, Benzophenone-4, Benzophenone-5, n-Hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, 4-Methylbenzylidene Camphor, Terephthalylidene Dicamphor Sulfonic Acid, Disodium Phenyl Dibenzenimidazole Tetrasulfonate, Ethylhexyl triazone, Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine, Diethylhexyl Butamido Triazone, 2,4,6-Tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-Tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-Tris(biphenyl-4-yl)-1,3,5-triazine, 2,4,6-Tris(terphenyl)-1,3,5-triazine, Methylene Bis-Benzotriazolyl Tetramethylbutylphenol, Drometrizole Trisiloxane, Polysilicone-15, Dineopentyl 4'-methoxybenzalmalonate, 1,1-Dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene, 2,4-Bis[5-(dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-triazine, camphor benzylkonium methosulfate, and their mixtures.

The inorganic UV filters may be selected from pigments (mean size of the primary particles: generally from 5 nm and 100 nm, preferably from 10 nm and 50 nm) formed of metal oxides which may or may not be coated, such as, for example, pigments formed of titanium oxide (amorphous or crystalline in the rutile and/or anatase form), iron oxide, zinc oxide, zirconium oxide or cerium oxide, which are all well-known UV photoprotective agents.

The pigments may or may not be coated. The coated pigments are pigments which have been subjected to one or more surface treatments of a chemical, electronic, mechanochemical and/or mechanical nature with compounds such as described, for example, in *Cosmetics & Toiletries*, February 1990, Vol. 105, pp. 53-64, such as amino acids, beeswax, fatty acids, fatty alcohols, anionic surfactants, lecithins, sodium, potassium, zinc, iron or aluminum salts of fatty acids, metal alkoxides (titanium or aluminum alkoxides), polyethylene, silicones, proteins (collagen,

elastin), alkanolamines, silicon oxides, metal oxides or sodium hexametaphosphate.

In a known manner, the silicones are organosilicon polymers or oligomers comprising a linear or cyclic and branched or crosslinked structure, of variable molecular weight, obtained by polymerization and/or polycondensation of suitable functional silanes and essentially composed of a repetition of main units in which the silicon atoms are connected to one another via oxygen atoms (siloxane bond), optionally substituted hydrocarbon radicals being connected directly to the said silicon atoms via a carbon atom.

The term "silicones" also encompasses the silanes necessary for their preparation, in particular alkylsilanes.

The silicones used for the coating of the pigments suitable for the present invention are preferably selected from the group consisting of alkylsilanes, polydialkylsiloxanes and polyalkylhydrosiloxanes. More preferably still, the silicones are selected from the group consisting of octyltrimethylsilane, polydimethylsiloxanes and polymethylhydrosiloxanes.

Of course, the pigments formed of metal oxides may, before their treatment with silicones, have been treated with other surfacing agents, in particular with cerium oxide, alumina, silica, aluminum compounds, silicon compounds or their mixtures.

The coated pigments are more particularly titanium oxides coated:
with silica, such as the product "Sunveil" from Ikeda;
with silica and with iron oxide, such as the product "Sunveil F" from Ikeda;
with silica and with alumina, such as the products "Microtitanium Dioxide MT 500 SA" and "Microtitanium Dioxide MT 100 SA" from Tayca, "Tioveil" from Tioxide and "Mirasun TiW 60" from Rhodia;
with alumina, such as the products "Tipaque TTO-55 (B)" and "Tipaque TTO-55 (A)" from Ishihara and "UVT 14/4" from Kemira;
with alumina and with aluminum stearate, such as the product "Microtitanium Dioxide MT 100 T, MT 100 TX, MT 100 Z or MT-01" from Tayca, the products "Solaveil CT-10 W" and "Solaveil CT 100" from Uniqema and the product "Eusolex T-AVO" from Merck;
with silica, with alumina and with alginic acid, such as the product "MT-100 AQ" from Tayca;
with alumina and with aluminum laurate, such as the product "Microtitanium Dioxide MT 100 S" from Tayca;

with iron oxide and with iron stearate, such as the product "Microtitanium Dioxide MT 100 F" from Tayca;
with zinc oxide and with zinc stearate, such as the product "BR351" from Tayca;
with silica and with alumina and treated with a silicone, such as the products "Microtitanium Dioxide MT 600 SAS", "Microtitanium Dioxide MT 500 SAS" or "Microtitanium Dioxide MT 100 SAS" from Tayca;
with silica, with alumina and with aluminum stearate and treated with a silicone, such as the product "STT-30-DS" from Titan Kogyo;
with silica and treated with a silicone, such as the product "UV-Titan X 195" from Kemira;
with alumina and treated with a silicone, such as the products "Tipaque TTO-55 (S)" from Ishihara or "UV Titan M 262" from Kemira;
with triethanolamine, such as the product "STT-65-S" from Titan Kogyo;
with stearic acid, such as the product "Tipaque TTO-55 (C)" from Ishihara; or
with sodium hexametaphosphate, such as the product "Microtitanium Dioxide MT 150 W" from Tayca.

Other titanium oxide pigments treated with a silicone are preferably TiO_2 treated with octyltrimethylsilane for which the mean size of the individual particles is from 25 and 40 nm, such as that marketed under the trademark "T 805" by Degussa Silices; TiO_2 treated with a polydimethylsiloxane for which the mean size of the individual particles is 21 nm, such as that marketed under the trademark "70250 Cardre UF $\text{TiO}_2\text{SI3}$ " by Cardre; and anatase/rutile TiO_2 treated with a polydimethylhydrosiloxane for which the mean size of the individual particles is 25 nm, such as that marketed under the trademark "Microtitanium Dioxide USP Grade Hydrophobic" by Color Techniques.

The uncoated titanium oxide pigments are, for example, marketed by Tayca under the trademarks "Microtitanium Dioxide MT 500 B" or "Microtitanium Dioxide MT600 B", by Degussa under the trademark "P 25", by Wacker under the trademark "Oxyde de titane transparent PW", by Miyoshi Kasei under the trademark "UFTR", by Tomen under the trademark "ITS" and by Tioxide under the trademark "Tioveil AQ".

The uncoated zinc oxide pigments are, for example: those marketed under the trademark "Z-cote" by Sunsmart;

those marketed under the trademark "Nanox" by Elementis; and those marketed under the trademark "Nanogard WCD 2025" by Nanophase Technologies.

The coated zinc oxide pigments are, for example:

those marketed under the trademark "Oxide zinc CS-5" by Toshiba (ZnO coated with polymethylhydrosiloxane);

those marketed under the trademark "Nanogard Zinc Oxide FN" by Nanophase Technologies (as a 40% dispersion in Finsolv TN, C₁₂-C₁₅ alkyl benzoate);

those marketed under the trademark "Daitopersion Zn-30" and "Daitopersion Zn-50" by Daito (dispersions in oxyethylenated polydimethylsiloxane/cyclopolymethylsiloxane comprising 30% or 50% of zinc nanooxides coated with silica and polymethylhydrosiloxane);

those marketed under the trademark "NFD Ultrafine ZnO" by Daikin (ZnO coated with phosphate of perfluoroalkyl and copolymer based on perfluoroalkylethyl as a dispersion in cyclopentasiloxane);

those marketed under the trademark "SPD-Z1" by Shin-Etsu (ZnO coated with silicone-grafted acrylic polymer dispersed in cyclodimethylsiloxane);

those marketed under the trademark "Escalol Z100" by ISP (alumina-treated ZnO dispersed in the ethylhexyl

methoxycinnamate/PVP-hexadecene copolymer/methicone mixture);

those marketed under the trademark "Fuji ZnO-SMS-10" by Fuji Pigment (ZnO coated with silica and polymethylsilsesquioxane);

and those marketed under the trademark "Nanox Gel TN" by Elementis (ZnO dispersed at 55% in C₁₂-C₁₅ alkyl benzoate with hydroxystearic acid polycondensate).

The uncoated cerium oxide pigments are marketed, for example, under the trademark "Colloidal Cerium Oxide" by Rhone-Poulenc.

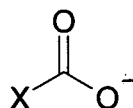
The uncoated iron oxide pigments are, for example, marketed by Arnaud under the trademarks "Nanogard WCD 2002 (FE 45B)", "Nanogard Iron FE 45 BL AQ", "Nanogard FE 45R AQ" or "Nanogard WCD 2006 (FE 45R)", or by Mitsubishi under the trademark "TY-220".

The coated iron oxide pigments are, for example, marketed by Arnaud under the trademarks "Nanogard WCD 2008 (FE 45B FN)", "Nanogard WCD 2009 (FE 45B 556)", "Nanogard FE 45 BL 345" or "Nanogard FE 45 BL" or by BASF under the trademark "Oxyde de fer transparent".

Mention may also be made of mixtures of metal oxides, in particular of titanium dioxide and of cerium dioxide, including the mixture of equal weights of titanium dioxide coated with silica and of cerium dioxide coated with silica marketed by Ikeda under the trademark "Sunveil A", and also the mixture of titanium dioxide and of zinc dioxide coated with alumina, with silica and with silicone, such as the product "M 261" marketed by Kemira, or coated with alumina, with silica and with glycerol, such as the product "M 211" marketed by Kemira.

The UV filter can generally be present in the compositions according to the present invention in proportions ranging from 0.01% to 40% by weight, with respect to the total weight of the composition, and preferably ranging from 0.1% to 10% by weight, with respect to the total weight of the composition.

The composition used for the present invention contains neither a reducing agent nor a source of carbonate ions of the formula:



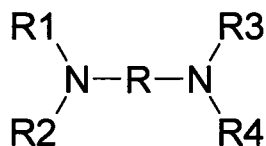
wherein

X is a group selected from the group consisting of O^- , OH , NH_2 , $\text{O}-\text{OH}$, and $\text{O}-\text{COO}^-$.

The pH of the composition may range from 6 to 11, preferably between 6.0 and 9.0, and more preferably between 6.0 to 8.0. Since the pH of the composition is not relatively high or low, damage to the keratin fibers by the composition can be reduced.

In order to adjust the pH, an acidic or alkali agent(s) other than sources of ions of the invention may be used alone or in combination. The amount of the acidic or alkali agent(s) is not limited, but may be from 0.1 to 5% by weight relative to the total weight of the composition. As the acidic agents, mention may be made of any inorganic or organic acids which are commonly used in cosmetic products such as citric acid, lactic acid, phosphoric acid or hydrochloric acid (HCl). HCl is preferable. As the alkali agents, mention may be made of any inorganic or organic basic agents which are commonly used in cosmetic products such as ammonia; alkanolamines such as mono-, di- and tri-ethanolamine, isopropanolamine; sodium and potassium hydroxides; urea, guanidine and their derivatives; basic amino acids such as

lysine or arginine; and diamines such as those described in the structure below:



wherein R denotes an alkylene such as propylene optionally substituted by a hydroxyl or a C₁-C₄ alkyl radical, and R₁, R₂, R₃ and R₄ independently denote a hydrogen atom, an alkyl radical or a C₁-C₄ hydroxyalkyl radical, which may be exemplified by 1,3-propanediamine and derivatives thereof. Arginine and monoethanolamine are preferred.

The composition used for the present invention may also comprise one or more additional cosmetic agent(s). The amount of the additional cosmetic agent(s) is not limited, but may be from 0.1 to 10% by weight relative to the total weight of the composition. The cosmetic agent(s) may be selected from the group consisting of volatile or non volatile, linear or cyclic, amine-type or not, silicones, cationic, anionic, non ionic or amphoteric polymers, peptides and derivatives thereof, protein hydrolyzates, synthetic or natural waxes, and especially fatty alcohols, swelling agents and penetrating agents, as well as other active compounds, such as anionic, cationic, non ionic, amphoteric or zwitterionic surfactants, agents for combating hair loss, anti-dandruff agents, associative-type or not, natural or synthetic thickeners, suspending agents, sequestering agents, opacifying agents, dyes, fillers, vitamins or provitamins, mineral, vegetable or synthetic oils, as well as fragrances, preserving agents, stabilizers, and mixtures thereof.

The vehicle for the composition used for the present invention is preferably an aqueous medium consisting of water and may advantageously contain one or several cosmetically acceptable organic solvents, which particularly include alcohols, such as ethyl alcohol, isopropyl alcohol, benzyl alcohol and phenylethyl alcohol, or polyols or polyol ethers, such as ethylene glycol monomethyl, monoethyl and monobutyl ethers, propylene glycol or ethers thereof, such as propylene glycol monomethylether, butylene glycol, dipropylene glycol as well as diethylene glycol alkyl ethers, such as diethylene glycol monoethylether or monobutylether. The water may be present in a concentration of from 10 to 90% by weight relative to the total weight of the composition. The organic solvent(s) may then be present in a

concentration of from 0.1 to 20% by weight, and preferably from 1 to 10% by weight relative to the total weight of the composition.

The composition used in the present invention may exist in any form such as a lotion, a gel, thickened or not, or a cream.

(Keratin Fiber Treatment Process)

The process for treating keratin fibers according to the present invention can be performed by applying onto the keratin fibers a composition comprising at least one UV filter, as described above; then placing the keratin fibers in an occlusive space; and then heating the keratin fibers,

According to the present invention relating to the treatment process for keratin fibers, keratin fibers such as hair are subjected to a specific heating process which is performed in an occlusive space.

The heating process can be performed by any heating means which can be freely controlled to realize the temperature desired for the process.

The heating process may preferably be performed by using a special heating device or devices that can form an occlusive space to restrict the evaporation of evaporable components such as water in the above-described composition from keratin fibers and keep a predetermined temperature in the heating device throughout the process.

If the evaporable components such as water in the above-described composition evaporate from the keratin fibers, most of the heat energy applied to the keratin fibers will be consumed by the evaporation, and therefore the temperature of the keratin fibers cannot increase up to the predetermined temperature until all evaporable components in the composition evaporate.

The above heating device may comprise a heat energy source being either in contact with keratin fibers or apart from keratin fibers, and at least one means to form an occlusive space surrounding the keratin fibers.

The heat energy source is used to heat keratin fibers. The heat energy source may be at least one heater providing at least one

selected from the group consisting of hot air, hot steam, high frequency induction heating, microwave heating, infrared ray irradiation, laser, and flash lamp irradiation.

The occlusive space may be formed by at least one coating means. A plurality of coating means may be used. The coating means may be rigid or flexible.

The coating means may comprise at least one member selected from the group consisting of a film and a sheet. The material of the film or the sheet is not limited. For example, the film or the sheet may comprise a thermoplastic or thermosetting resin, a paper, a textile, a bonnet, a metal foil such as aluminum foil, and the like.

For example, the film or sheet may be set on a heating rod, a heating bar or a heating plate which is covered by keratin fibers.

According to the present invention, the coating means may comprise the heat energy source. Therefore, for example, the film or sheet which includes a heater may be set on a rod, a bar, or a plate which is covered by keratin fibers.

The occlusive conditions can restrict the evaporation of evaporable components such as water in the above-described composition applied to keratin fibers, and therefore the temperature of the keratin fibers can be increased higher than that obtainable by a conventional heating process or device for the keratin fibers in open conditions. Furthermore, the keratin fibers can be heated effectively, and the keratin fibers can be heated evenly.

According to one variant of the present invention, the occlusive space may comprise apertures, the surface area of which is less than 5%, preferably less than 3% and more particularly less than 0.5% of the total surface area of the coating means. According to this variant, the total surface area of the coating means comprises the surface area of, when it is present, an opening means for the coating means.

The apertures may be passages, holes or orifices, which may allow an exchange of air between the occlusive space and the exterior thereof, especially when the reaction such as forming vapor inside the occlusive space is too great. On the other hand, a

person skilled in the art could form the apertures such that the diffusion of heat in the occlusive space is not impaired.

The keratin fibers can be heated at 45°C to 250°C, preferably 60°C to 200°C, more preferably 60°C to 150°C, more preferably 60°C to 90°C, during the step of heating the keratin fibers.

The heating process may be performed for an appropriate time which is required to treat keratin fibers. The time length for the heating process is not limited, but it may be from 1 minute to 2 hours, preferably 1 minute to 1 hour, and more preferably 1 minute to 30 minutes. For example, the time for heating may be from 5 to 20 minutes, preferably 10 to 15 minutes.

The keratin fibers may be rinsed after the step of applying the composition onto the keratin fibers and/or after the step of heating the keratin fibers.

(Permanent Deformation Process for Keratin Fiber)

According to the present invention relating to the treatment process for keratin fibers, the keratin fiber may be subjected to mechanical tension which is typically used for permanent deformation.

The permanent deformation process for keratin fibers when mechanical tension is applied to keratin fibers may be performed as follows.

First, keratin fibers are subjected to mechanical tension for deformation. The mechanical tension can be applied to the keratin fibers by any means to deform the keratin fibers to an intended shape. For example, the mechanical tension may be provided by at least one reshaping means selected from the group consisting of a curler, a roller, a clip, a plate and an iron. The reshaping means may comprise at least one heater as described above. If the keratin fibers are rolled around a curler, this rolling-up may be performed on the entire length of the keratin fibers or, for example, on half the length of the keratin fibers. Depending on, for example, the desired hairstyle shape and amount of curls, the rolling-up may be performed with more or less thick locks.

Next, the above-described composition is applied to the keratin fibers. The application of the composition may be performed by

any means, such as a brush and a comb. The keratin fibers to which the mechanical tension has been applied should be treated with the composition. It may be possible that the keratin fibers are left as they are for a certain amount of time, if necessary.

Lastly, the above-described heating process is performed. The heat energy is applied to the keratin fibers under occlusive conditions as described above.

This process for permanent deformation of keratin fibers may be performed without any step of oxidizing the keratin fibers. Therefore, the time required for the process according to the present invention can be shorter than that for a conventional process which needs an oxidizing step. Furthermore, damage to the keratin fibers by the oxidizing step can be avoided.

The keratin fibers may be rinsed after the step of applying the composition onto the keratin fibers and/or after the step of heating the keratin fibers.

One embodiment of the hair treatment process according to the present invention may be a process for reshaping or permanent deforming keratin fibers, in particular hair, comprising:

- a) a step of placing the keratin fibers under mechanical tension by rolling them up on at least one reshaping or mechanically tensioning means so as to form curls;
- b) a step of applying the above-described composition to the keratin fibers;
- c) an optional step of rinsing the keratin fibers,
- d) a step of placing at least one coating means on the reshaping or mechanically tensioning means or vice versa to form one or more occlusive spaces, and
- e) a step of heating the keratin fibers at a temperature of between 45 ± 2 or 3°C and 250 ± 2 or 3°C for 1 minute to 2 hours.

In this process, the temperature can be set, adjusted and regulated by using one or more heating means, and may be measured with a thermo-measurement probe such as Digital Surface Sensor Module, reference MT-144, sold by Sakaguchi E.H VOC Corp (Japan), set on the keratin fibers. Normally, the probe is set on a single keratin fiber. However, it is advantageous that the probe is set on the part of the keratin fibers which directly contacts with the occlusive space, and more preferably, the probe is set on the part of the keratin fibers which directly contacts with

the occlusive space and forms the curl end of the keratin fibers, if a curler is used.

Preferably, the temperature is measured at atmospheric pressure of 101325 Pa.

According to the present invention, the temperature of the keratin fibers may be constant with a fluctuation of ± 2 or 3°C over the head, if the keratin fibers are hair, of an individual, and the probe may be set on any type of keratin fibers.

If the keratin fibers are hair, according to the present invention, the constant temperature with a fluctuation of ± 2 or 3°C can be obtained for any type of hair, and the temperature of the hair can be controlled to be constant ± 2 or 3°C during the heating of the hair at a certain temperature. Thus, the hair style becomes uniform and homogeneous for the entirety of the hair, and a more excellent hair style can be finally obtained.

Advantageously, the coating means may comprise one or more thermal insulating materials, and more advantageously, the coating means may consist of the material(s).

The term "thermal insulating material" means any material which has an electric conductivity of 0 to $1 \text{ W/m}^{\circ}\text{C}$ (PVC: $0.17 \text{ W/m}^{\circ}\text{C}$).

Preferably, the heating means may be adjusted such that the temperature measured on the keratin fibers is 50°C or more, more preferably 55°C to less than 150°C , and further more preferably less than 100°C . It is preferable that the heating is performed by heating via electrical resistance.

Advantageously, the coating means is impermeable with regard to the composition used in the step b).

In the above embodiment, at least one of the reshaping or mechanical tensioning means and at least one of the covering means may include a heater.

In the above embodiment, "occlusive space" means that when the coating means is placed on the reshaping or mechanical tensioning means, or vice versa, they together form a closed structure in which heat can diffuse, but heat cannot diffuse out of or is difficult to diffuse out of the closed structure. It is preferable that the coating means and the reshaping or mechanical

tensioning means can form the occlusive space when they are set on the head, if the keratin fibers are hair.

The occlusive space may form a condensation cage in which water and a component or components in the composition used in the step b) may evaporate from the keratin fibers, adhere to the wall of the coating means, and drop onto the keratin fibers. This cycle may be repeated during the heating of the keratin fibers. Thus, the keratin fibers can be always kept wet, and drying and deteriorating of the keratin fibers will be prevented.

The formation of occlusive space is an important characteristic of the present invention, because the keratin fibers in the occlusive space can be kept wet and the temperature of the keratin fibers can be constant.

Preferably, the process of the present invention may comprise an additional step of tightening the coating means on the head of an individual, if the keratin fibers are hair, by an elastic cord, an extensible band, or a stretch.

According to the process of the present invention, because of the occlusive space in which the composition can be continuously condensed on the keratin fibers, the amount of a cosmetic component or components in the composition is advantageously reduced as compared to the processes in the prior art. The amount of the cosmetic component(s) may be 0.3 to 3wt% of the composition.

In a preferred embodiment, a coating means may be placed on each hair curler as the reshaping or mechanically tensioning means, if the keratin fibers are hair. In other words, each of the hair curlers, if two or more hair curlers are used, may be covered individually by a coating means. It is advantageous to cover each hair curler because leaking to the scalp of the composition which has been applied onto keratin fibers in the step b) can be prevented.

In another preferred embodiment, a coating means may cover all hair curlers, if two or more hair curlers are used. In other words, the coating means may cover the entirety of the head if the keratin fibers are hair.

Advantageously, the occlusive space formed in the step d) may be maintained during the step e). In other words, the coating means may be removed only after the step e) or after the stop of the heating in the step e).

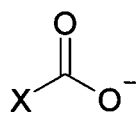
If necessary, the composition may be applied to keratin fibers before applying mechanical tension to the keratin fibers. It may be possible that the keratin fibers are left as they are for a certain amount of time, if necessary, before and/or after applying mechanical tension to the keratin fibers, before and/or after applying the above-described composition to the keratin fibers, and before and/or after heating the keratin fibers.

After the above step e), if necessary, the keratin fibers may be fixed by oxidation after being taken out from the coating means.

(Products)

The present invention also relates to a composition for treating keratin fibers to be heated in an occlusive space, comprising at least one UV filter,
wherein

the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

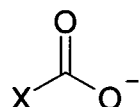
X is a group selected from the group consisting of O^- , OH , NH_2 , $\text{O}-\text{OH}$, and $\text{O}-\text{COO}^-$.

This composition may not need to be used in combination with an oxidizing agent which is used in a conventional permanent deformation of keratin fibers. Therefore, if keratin fibers should be permanently deformed, the composition may be used in one step, whereas two steps (reducing step and oxidizing step) are necessary in the conventional permanent deformation of keratin fibers.

This composition may have the same technical features as those of the composition described above.

The present invention also relates to a kit for treating keratin fibers, comprising:

a device comprising
 at least one reshaping means to provide the keratin fibers with mechanical tension,
 at least one coating means to form an occlusive space, and
 at least one heater to heat the keratin fibers in the occlusive space;
 and
 a composition comprising at least one UV filter wherein the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH, NH_2 , O-OH, and $\text{O}-\text{COO}^-$.

The coating means and the heater, as well as the composition in the kit, may be the same as those described above.

EXAMPLES

The present invention will be described in more detail by way of examples, which however should not be construed as limiting the scope of the present invention.

Composition 1

A hair treatment composition (referred to as "Composition 1") having the following composition shown in Table 1 was prepared (active ingredients in wt %).

Table 1

2-phenyl-benzimidazol-5-sulfonique (EUSOLEX 232 from MERCK)	6
Hydroxyethylcellulose (MW 720,000)	0.7
Decylpolyglucoside	9
Benzyl alcohol	5
Propylene glycol	7
Preservatives	qs
pH adjuster	qsp pH 7.3±0.2
Water	qsp 100

Example 1

Composition 1 was applied to a 1g natural Japanese hair swatch previously wrapped on a 1.7 cm heating perm-roller. Then, the perm-roller was covered by a plastic film and plugged into a Digital Perm Machine (Oohiro, model ODIS-2). After the heating process at 90°C for 15 minutes, the hair was rinsed, removed from the perm-roller and dried.

The hair was resistant against various external aggressions.

Composition 2

A hair treatment composition (referred to as "Composition 2") having the following composition shown in Table 2 was prepared (active ingredients in wt %).

Table 2

Camphor benzylkonium methosulfate at 30% in water	30
Hydroxyethylcellulose (MW 720,000)	0.7
Decylpolyglucoside	9
Benzyl alcohol	5
Propylene glycol	7
Preservatives	qs
pH adjuster	qsp pH 7±0.2
Water	qsp 100

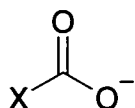
Example 2

Composition 2 was applied to a 1g Japanese hair swatch. Then, the hair was wrapped by a plastic film and covered by a flexible heating film (FTH-050 from Tokyo Technological Labo). The hair was heated in occlusive conditions for 10 minutes at 90°C. After the heating step, the hair was rinsed and dried.

The hair was resistant against various external aggressions.

CLAIMS

1. A process for treating keratin fibers comprising the steps of:
applying onto the keratin fibers a composition comprising at least one UV filter;
then placing the keratin fibers in an occlusive space; and
then heating the keratin fibers,
wherein
the composition contains a reducing agent nor a source of carbonate ions of the formula:



wherein

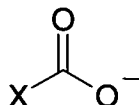
X is a group selected from the group consisting of O^- , OH , NH_2 , $\text{O}-\text{OH}$, and $\text{O}-\text{COO}^-$.

2. The process according to Claim 1, further comprising the step of rinsing the keratin fibers after the step of applying the composition onto the keratin fibers and/or after the step of heating the keratin fibers.
3. The process according to Claim 1 or 2, further comprising providing the keratin fibers with mechanical tension.
4. The process according to any one of Claims 1 to 3, wherein the occlusive space is formed by at least one coating means.
5. The process according to Claim 4, wherein the coating means is rigid or flexible.
6. The process according to Claim 4 or 5, wherein the coating means comprises at least one member selected from the group consisting of a film and a sheet.
7. The process according to any one of Claims 1 to 6, wherein the keratin fibers are heated at 45°C to 250°C during the step of heating the keratin fibers.
8. The process according to any one of Claims 1 to 7, wherein the keratin fibers are heated by at least one heater providing at least one selected from the group consisting of hot air, hot steam, high frequency induction heating,

microwave heating, infrared ray irradiation, laser, and flash lamp irradiation.

9. The process according to Claim 8, wherein the coating means comprises the heater.
10. The process according to any one of Claims 1 to 9, wherein the UV filter is an organic UV filter.
11. The process according to any one of Claims 1 to 10, wherein the UV filter is selected from the group consisting of anthranilates; dibenzoylmethane derivatives; cinnamic derivatives; salicylic derivatives; camphor derivatives; benzophenone derivatives; β,β -diphenylacrylate derivatives; triazine derivatives; benzotriazole derivatives; benzalmalonate derivatives; benzimidazole derivatives; imidazolines; bis-benzoazolyl derivatives; p-aminobenzoic acid (PABA) derivatives; methylene bis(hydroxyphenylbenzotriazole) derivatives; benzoxazole derivatives; screening polymers and screening silicones; dimers derived from α -alkylstyrene; 4,4-diarylbutadienes; and mixtures thereof.
12. The process according to any one of Claims 1 to 11, wherein the UV filter is selected from the group consisting of ethylhexyl methoxycinnamate, homosalate, ethylhexyl salicylate, octocrylene, phenylbenzimidazole sulfonic acid, benzophenone-3, benzophenone-4, benzophenone-5, n-hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate, 4-methylbenzylidene camphor, terephthalylidene dicamphor sulfonic acid, disodium phenyl dibenzimidazole tetrasulfonate, ethylhexyl triazone, bis-ethylhexyloxyphenol methoxyphenyl triazine, diethylhexyl butamido triazone, 2,4,6-tris(dineopentyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(diisobutyl 4'-aminobenzalmalonate)-s-triazine, 2,4,6-tris(biphenyl-4-yl)-1,3,5-triazine, 2,4,6-tris(terphenyl)-1,3,5-triazine, methylene bis-benzotriazolyl tetramethylbutylphenol, drometrizole trisiloxane, polysilicone-15, dineopentyl 4'-methoxybenzalmalonate, 1,1-dicarboxy(2,2'-dimethylpropyl)-4,4-diphenylbutadiene, 2,4-bis[5-(dimethylpropyl)benzoxazol-2-yl-(4-phenyl)imino]-6-(2-ethylhexyl)imino-1,3,5-triazine, camphor benzylkonium methosulfate and mixtures thereof.

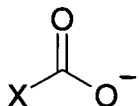
13. The process according to any one of Claims 1 to 12, wherein the composition comprises the UV filter in an amount of 0.01 to 40% by weight relative to the total weight of the composition.
14. A composition for treating keratin fibers to be heated in an occlusive space, comprising at least one UV filter, wherein the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH, NH_2 , O-OH, and $\text{O}-\text{COO}^-$.

15. A kit for treating keratin fibers, comprising:
a device comprising
at least one coating means to form an occlusive space, and
at least one heater to heat the keratin fibers in the occlusive space;
and
a composition comprising at least one UV filter,
wherein
the composition contains neither a reducing agent nor a source of carbonate ions of the formula:



wherein

X is a group selected from the group consisting of O^- , OH, NH_2 , O-OH, and $\text{O}-\text{COO}^-$.

INTERNATIONAL SEARCH REPORT

International application No
PCT/JP2009/071732

A. CLASSIFICATION OF SUBJECT MATTER

INV. A45D7/02 A61K8/49 A61Q5/00 A61Q5/04 A61Q5/06
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A45D 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 practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/166336 A1 (DE LA METTRIE ROLAND [FR]) 4 August 2005 (2005-08-04) cited in the application examples paragraphs [0017], [0164] claim 4	1-8, 10-15
X	EP 2 022 472 A1 (KPSS KAO GMBH [DE]) 11 February 2009 (2009-02-11) paragraphs [0001], [0003] - [0005], [0015], [0 16] examples claims 1, 13	1-8, 10-15
X	EP 2 111 852 A2 (HENKEL AG & CO KGAA [DE]) 28 October 2009 (2009-10-28) paragraphs [0009], [0014], [0101] - [0118], [0157], [0158], [0163], [0164] claims 1, 10	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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

"E" earlier document 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

5 October 2010

Date of mailing of the international search report

02/11/2010

Name and mailing address of the ISA/

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

Authorized officer

Perrone Dunet, S

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/JP2009/071732

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005166336 A1	04-08-2005	NONE	
EP 2022472 A1	11-02-2009	EP 2022468 A1	11-02-2009
		US 2009041702 A1	12-02-2009
EP 2111852 A2	28-10-2009	DE 102008020044 A1	22-10-2009