DESCRIPTION

HAIR TREATMENT COMPOSITION

FIELD OF THE INVENTION

The present invention relates to aqueous hair treatment compositions, and more specifically to hair conditioning compositions providing the hair with luster and volume, as well as smooth combability, and particularly when used on the damaged dry hair, imparting shine, softness and pliability.

BACKGROUND OF THE INVENTION

In recent years, various hair conditioning compositions are used, and these compositions are commonly purposed to provide the hair with improved conditions, such as luster, volume, smooth combability and pliability.

Some of these classical compositions fall into either of the following types; the type of a composition which may keep its component on the hair, or the type of a composition which may be rinsed off after application.

However, these types are still insufficient in conditioning effectivity, and this problem is emergent especially when used on the damaged dry hair.

According to the present invention, therefore, there are provided hair treatment compositions comprising of providing the hair with luster and volume, as well as smooth combability, and imparting softness and pliability.

DISCLOSURE OF THE INVENTION

In light of these circumstances, the present inventors carried out extensive research for providing a solution to the above problem, and as a consequence of such effort, they have found that aqueous hair treatment compositions according to the present invention, which contain a mixture of lactic acid, citric acid and pyrrolidone carboxylic acid at their respectively defined weight proportion, exhibit significantly improved hair conditioning effectivity. Thus, the present invention has been accomplished.

More specifically, the present invention provides hair treatment compositions containing, on an aqueous or aqueous-alcoholic basis, a mixture of the following components (a), (b) and (c) at their respectively defined weight percentages:

(a) lactic acid	at least 0.01 wt.%
(b) citric acid	at least 0.01 wt.%
(c) pyrrolidone carboxylic acid	at least 0.01 wt.%

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The hair treatment compositions according to the present

invention are designed to be applied to the hair as a final treatment after washing, perming, coloring, etc. All percentages as mentioned above are calculated to the total composition.

In the present compositions, the component (a), lactic acid, may be contained in a proportion of at least 0.01 wt.%, preferably in a proportion of 0.05 - 2 wt.%, more preferably in a proportion of 0.1 - 1 wt.%, calculated to the total composition.

Also, the component (b), citric acid, may be contained in a proportion of at least 0.01 wt.%, preferably in a proportion of 0.05 - 1 wt.%, more preferably in a proportion of 0.1 - 0.5 wt.%, calculated to the total composition.

The component (c), pyrrolidone carboxylic acid (i.e., 5-oxo-pyrrolidine-2-carboxylic acid known under the term pyroglutamic acid), may be contained in a proportion of at least 0.01 wt.%, preferably in a proportion of 0.5 - 2 wt.%, more preferably in a proportion of 0.1 - 1 wt.%, calculated to the total composition.

The hair conditioning effect of the compositions according to the invention may be further improved by addition of one or more organic acids selected from the group of glycolic acid, malic acid, glyoxylic acid, tartaric acid, mandelic acid, and pyruvic acid. Said organic acids may be contained preferably in a proportion of at least 0.01 wt.%, particularly at least 0.05 wt.%, calculated to the total composition.

The upper limit of these organic acids is not critical and

mainly determined by the desired pH-value of the composition according to the invention. The preferred pH-value is from 2 to 7, particularly from 4 to 5.5. Generally, the total proportion of the above referred organic acids is about 5 wt.%, preferably about 2.5 wt.%, calculated to the total composition. On the other hand, the lower limit is preferably about 0.05 wt.%, particularly 0.25 wt.%, calculated to the total composition. These organic acids may be obtained from plant and fruit juices or extracts thereof.

Among another preferred additives is included glycerol preferably in a minimum quantity of 0.5 wt.%, particularly 1 - 10 wt.%, of the composition.

The term "hair treatment compositions" as used herein describes preparations which are applied onto the hair after shampooing, permanent waving or dyeing (with regards to the definition, cf. K.Schrader, "Grundlagen und Rezepturen der Kosmetika", 2nd Ed. (1989, Hutig Buchverlag, Heidelberg), pp. 722 - 724). They are usually prepared as aqueous or aqueous-alcoholic solutions, emulsions or dispersions and may optionally be also applied as aerosols, particularly aerosol foams.

The compositions according to the invention preferably contain at least one cationic surfactant, especially in a proportion from 0.1% to 7.5 wt.%, particularly 0.25 to 5 wt.% of the total composition.

Suitable cationic surfactants as mentioned above include

long-chain quaternary ammonium compounds, in particular represented by the examples; cetyl trimethyl ammonium chloride, dimethyl dicetyl ammonium chloride, trimethyl ammonium chloride, dimetyl dicetyl ammonium chloride, trimethyl cetyl ammonium bromide, stearyl trimethyl ammonium chloride, dimethyl stearyl benzyl ammonium chloride, benzyl tetradecyl dimethyl ammonium chloride, dimethyl dehydrated tallow ammonium chloride, lauryl pyridinium chloride, lauryl dimethyl benzyl ammonium chloride, lauryl trimethyl ammonium chloride, tris(oligooxyethyl)alkyl ammonium phosphate, cetyl pyridimium chloride, etc., which maybe used alone or in admixture.

Particularly suitable is a mixture of dicetyl dimethyl ammonium chloride with stearyl trimethyl ammonium chloride, preferably in a weight ratio of 1 : 5 to 5 : 1.

Useful are also quaternary ammonium salts disclosed in European Patent Application No. 472,107.

In principle, all quaternary ammonium compounds listed in "CTFA Cosmetic Ingredient Dictionary", Fourth Ed. (1991) under the generic name "Quaternium" may be applied.

Of course, the composition may also comprise all ingredients known per se in such conditioning compositions; to avoid repetition, reference is again made to K.Schrader, "Grundlagen und Rezepturen der Kosmetika", 2nd Ed. (1989, Huting Buchverlag Heidelberg), pp. 722 - 771.

Nonionic surfactants may also be used, particularly in admixture with cationic surfactants, e.g., amineoxides in a proportion from about 0.25% to about 5%, preferably from about 0.5% to about 3.5 %by weight, calculated to the total composition.

These amineoxides have been known in the art for a long time, e.g., C_{12}-C_{18}-alkyl dimethyl amineoxides such as lauryl dimethyl amineoxide, C_{12}-C_{18}-alkyl amidopropyl or -ethyl amine oxides, C_{12}-C_{18}-alkyl di(hydroxyethyl) or (hydroxypropyl) amine oxides, or amineoxides with ethylene oxide and (or) propylene oxide groups in the alkyl chain. These amineoxides are available on the market, e.g. under the trade name "Ammonyx ", or "Genaminox ".

C_8-C_{18}-alkyl glucosides having a condensation degree from about 1.2 to about 2.5 are also preferred nonionic surfactants.

The compositions according to the invention may also contain amphoteric or zwitterionic surfactants, preferably in admixture with cationic surfactants, in a proportion from about 0.1% to about 5%, particularly from about 0.5% to about 3% by weight, calculated to the total composition. As such, various known betaines such as fatty acid amidoalkyl betaines and sulfobetaines, e.g. lauryl hydroxysulfobetaine, are mentioned.

Complexing agents, dyestuffs, preservatives, pH-regulants, viscosity modifiers such as inorganic salts, fragrances, pearl gloss agents, thickeners, humectants, plant and animal oils such as jojoba oil, etc. are typical examples for optional additives.

Particularly suitable additives are further hair conditioning actives, especially cationic polymers, preferably in a proportion between 0.05% to 2.5%, particularly 0.2% to 1.5% by weight of the total composition. European Patent No. 337,354 discloses the use of cationic polymers together with alkyl polyglucoside surfactants; the cationic polymers listed therein on pp. 3 - 7 are also appropriate conditioning additives in the compositions of the invention; equally useful are the products known under the generic name "Polyquaternium" as listed in 'CTFA Cosmetic Ingredient Dictionary, Fourth Ed. (1991)".

Further conditioning additives are protein hydrolyzates, e.g. in a quantity from 0.25% to 5%, preferably 0.5% to 2.5% by weight of the total composition, or water-soluble collagen or collagen derivatives.

The various polysiloxanes may also be used as conditioning additives in the hair conditioning compositions according to the invention. Their preferred proportion is from about 0.25% to about 5%, particularly from 0.5% to 2.5% by weight of the total composition. Suitable are both highly volatile and less volatile cyclic or linear polysiloxanes, i.e. silicone oils, e.g., known under the generic names "Dimethicone" or "Phenyldimethicone" and "Cyclomethicone". The silicone derivatives described in European Patent No. 398,177, which are used there in combination with alkyl polyglucosides, may also be applied.

The preparation of the compositions according to the invention is effected by combining and mixing of the single components in

water or water-alcohol, whereby premixes of different ingredients may also be used.

Examples

The present invention is illustrated by the following examples, but not limited to these examples.

The hair treatment compositions according to invention are prepared having the fomulations shown by the following Examples 1-5, respectively.

Example 1

Hair care lotion

Cetyl stearyl alcohol	5.00 (% by wt.)
Dicetyl dimonium chloride	1.60
Burdock root oil extract	1.00
Hydroxypropyl Guar hydroxypropyl trimonium chloride	0.40
Isopropyl alcohol	1.50
Isopropyl myristate	1.20
Panthenol	0.50
Perfume	0.40
Lactic acid	0.55
Citric acid	0.05
Pyrrolidone carboxylic acid	0.02
Tartaric acid	0.02
Malic acid	0.01
Preservatives	q.s.
Water	balance
Total	100.00

Example 2

Hair care tonic

Burdock root oil extract	0.50 (% by wt.)
Phytantriol	0.10
Panthenol	0.20
Behentrimonium chloride	0.10
Hydroxypropyl Guar hydroxypropyl trimonium chloride	0.03
Isostearyl glyceryl pentaerytryl ether	0.10
Quaternary polysiloxane	0.15
Lactic acid	0.25
Pyrrolidone carboxylic acid	0.05
Citric acid	0.15
Malic acid	0.05
Pyruvic acid	0.05
Perfume	0.40
Ethanol	35.00
Water	balance
Total	100.00

Example 3

Conditioner for porous and dry hair

Cetyl stearyl alcohol	5.50 (% by wt.)
Dicetyl dimonium chloride	0.50
Stearyl trimonium chloride	0.40
Isostearyl glyceryl pentaerythryl ether	0.20
Wheat bran oil	0.10
Wheat protein hydrolyzate	0.50
Isopropyl myristate	0.50
Panthenol	0.20
Lactic acid	0.15
Citric acid	0.15
Pyrrolidone carboxylic acid	0.05
Malic acid	0.05
Glycolic acid	0.02
Pyruvic acid	0.02
Tartaric acid	0.06
Perfume	0.35
Preservatives	q.s.
Water	balance
Total	100.00

The treatment of shampooed hair with the compositions according to Examples 1 to 3 resulted in distinctly improved wet and dry combability of the hair, a relaxed and soft touch, and enhanced shine compared in half-side testing with a composition which did not contain the mixture of hydroxy carboxylic acids according to the invention.

Example 4

Conditioner for dyed hair

Cetyl stearyl alcohol	5.00 (% by wt.)
Dicetyl dimonium chloride	1.00
Isopropyl myristate	0.40
Isopropyl alcohol	0.50
Isostearyl glyceryl pentaerythryl ether	0.20
Aloe vera leaves extract	0.50
Lecithin	0.50
Panthenol	0.20
Lactic acid	0.15
Citric acid	0.15
Pyrrolidone carboxylic acid	0.10
Malic acid	0.03
Pyruvic acid	0.02
Tartaric acid	0.05
Glycolic acid	0.05
Perfume	0.45
Preservatives	q.s.
Water	balance
Total	100.00

In addition to the conditioning effect achieved with the compositions of Examples 1 to 3, Example 4 also effected a revival of the color brilliance of the hair.

Example 5

Conditioner for permanently waved hair

Cetyl stearyl alcohol	5.00 (% by wt.)
Dicetyl dimonium chloride	1.20
Almond oil	0.50
Lecithin	0.50
Almond protein hydrolyzate	0.50
Panthenol	0.20
Glycerol	0.50
Lactic acid	0.20
Pyrrolidone carboxylic acid	0.03
Citric acid	0.03
Malic acid	0.02
Pyruvic acid	0.01
Tartaric acid	0.01
Perfume	0.40
Preservatives	q.s.
Water	balance
Total	100.00

INDUSTRIAL APPLICABILITY OF THE INVENTION

In accordance with the present invention, the hair treatment compositions are provided as excellent novel products having significantly improved properties, in particular such as laster and volume, as well as imparted shine, softness and pliability.

* C L M S *

CLAIMS

1. A hair treatment composition for human hair on an aqueous or aqueous-alcoholic basis, containing a mixture of
   a) at least 0.01% by weight of lactic acid;
   b) at least 0.01% by weight of citric acid; and
   c) at least 0.01% by weight of pyrrolidone carboxylic acid,
   all percentages calculated to the total composition.

2. A hair treatment composition according to claim 1, additionally containing at least 0.5% by weight of glycerol.

3. A hair treatment composition according to claim 1 or 2, additionally containing at least one organic acid selected from the group of glycolic acid, malic acid, glyoxylic acid, tartaric acid, mandelic acid, and pyruvic acid.

4. A hair treatment composition according to claims 1, 2 or 3, containing 0.1% to 5% by weight, calculated to the total composition, of cationic surfactant.