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(54) Title: DYES FOR KERATINIC FIBERS COMPRISING A SPECIAL ANIONIC THICKENER

(57) Abstract: The invention relates to compositions for the oxidative or non-oxidative dyeing of keratin fibers, compositions for the simultaneously lightening and coloring of keratin fibers or compositions for the bleaching of keratin fibers, comprising an anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer, as well as the use of the above anionic acrylic thickener to thicken compositions for the oxidative or non-oxidative dyeing of keratin fibers, compositions for the simultaneously lightening and coloring of keratin fibers or compositions for the bleaching of keratin fibers.

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DYES FOR KERATINIC FIBERS COMPRISING A SPECIAL ANIONIC THICKENER

FIELD OF THE INVENTION

The subject matter of the present application are compositions and methods for dyeing keratin fibers comprising a special anionic acrylic polymer as thickener.

BACKGROUND OF THE INVENTION

The object of the invention are thickened compositions for dyeing and/or lightening/bleaching keratin fibers, particularly human hair, that contain direct and/or oxidation dyes and/or bleaching/oxidizing agents and a special thickener, as well as a method for coloring and/or bleaching hair by use of such compositions,

Coloring and bleaching compositions are usually in the form of aqueous -preferably thickened- solutions or emulsions. Oxidation dyes and bleaching compositions as a rule consist of two components (i) a carrier composition containing the dyes or the bleaching agent and (ii) an oxidizing agent, said components being mixed with one another prior to use and then applied to the hair. Mixing will produce a higher or lower viscosity, depending on the viscosity and mixing ratio of the two components. Normally a good adhesion (i.e. a higher viscosity) of the ready-to-use composition is appreciated. In addition, the hairdressers often needs for their work higher viscosities, for example for special strand or sheet techniques and when special work is to be done with the dye brush or the highlighting brush.

SUMMARY OF THE INVENTION

Hence, a great need existed for economical thickening of the compositions that would ensure good miscibility of said carrier composition with the oxidant and would afford colorants/bleaching compositions with good adhesion properties and coloring/bleaching characteristics.

DETAILED DESCRIPTION OF THE INVENTION

It has now been found that the aforesaid problem can be solved by the use of special anionic acrylic polymers as described in WO 01/97772.

The present invention therefore relates to

- a) an agent for the oxidative coloring of keratin fibers, in particular human hair, comprising at least one oxidative dye precursor and at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight (of the total polymer), preferably from 6 to 35 percent, preferably from 8 to 30 percent;
- b) an agent for the non-oxidative coloring of keratin fibers, in particular human hair, comprising at least one direct dye and at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight (of the total polymer), preferably from 6 to 35 percent, preferably from 8 to 30 percent;
- c) an agent for the simultaneously lightening and coloring of keratin fibers, in particular human hair, comprising at least one bleaching agent (e.g. persulfates), at least one dye which is stable in the presence of the used oxidizing agent, and at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight (of the total polymer), preferably from 6 to 35 percent, preferably from 8 to 30 percent;
- d) an agent for the bleaching of keratin fibers, in particular human hair, comprising at least one bleaching agent (e.g. persulfates) and at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight (of the total polymer), preferably from 6 to 35 percent, preferably from 8 to 30 percent;
- e) an agent for the simultaneously lightening and coloring of keratin fibers, in particular human hair, which is mixed with an oxidizing agent (e.g. hydrogen peroxide) prior to use, comprising at least one dye which is stable in the presence of the used oxidizing agent, and at least one

anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight (of the total polymer), preferably from 6 to 35 percent, preferably from 8 to 30 percent.

Especially preferred are anionic acrylic polymers wherein said monomer performing a weak acid function is selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, maleic acid and fumaric acid and said monomer performing a strong acid function is selected from the group consisting of monomers having a function of the sulfonic acid type or phosphonic acid type, such as 2-acrylamido-2-methylpropane sulfonic acid (AMPS).

Furthermore the anionic acrylic polymer may be crosslinked (or branched) by one of the following crosslinking agents: methylene bisacrylamide (MBA), ethylene glycol diacrylate, polyethylene glycol dimethacrylate, diacrylamide, cyanomethacrylate, vinyloxyethacrylate or methacrylate, formaldehyde, glyoxal, and compositions of the glycidylether type such as ethyleneglycol diglycidylether, or epoxydes.

Particularly preferred anionic acrylic thickeners are Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymers. A particularly suitable anionic acrylic thickeners with the INCI name Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymer & Hydrogenated Polydecene & Sorbitan Laurate & Trideceth-6 is marketed by Arch Personal Care Products, South Plainfield, USA under the tradename ViscUp® EZ. For further details of the structure and the preparation of said anionic acrylic thickeners reference is made to WO 01/97772; that herewith is explicitly incorporated herein by reference.

The anionic acrylic thickener is preferably contained in the agent of the invention in an amount from 0.01 to 8.0 percent by weight and particularly from 0.1 to 5 percent by weight (based on the active substance).

If the agent according to the invention is the agent for the oxidative coloring of keratin fibers (a) it comprises oxidative hair dye precursors that will deliver a variety of hair colors to the hair. These

small molecules are activated by an oxidizing agent or air oxygen and react with further molecules to form a larger colored complex in the hair shaft. Suitable oxidative hair dye precursors are developers, couplers and compounds coupling with themselves. The developers may be used alone or in combination with other developers (also known as primary intermediates), and one or more may be used in combination with one or more couplers. Couplers (also known as color modifiers or secondary intermediates) are generally colorless molecules that can form colors in the presence of activated developers, and are used with other developers or couplers to generate specific color effects or to stabilize the color. The choice of developers and couplers will be determined by the color, shade and intensity of coloration that is desired. The developers and couplers may be used herein, singly or in combination, to provide dyes having a variety of shades ranging from ash blonde to black.

Suitable oxidative hair dye precursors are, for example, the following developers, couplers and compounds coupling with themselves:

Developers: p-phenylenediamine derivatives; p-aminophenol derivatives and heterocyclic derivatives, such as: 1,4-diamino-2,6-dimethylbenzene, 1,4-diamino-2,5-dimethylbenzene, 1,4-diamino-2,3-dimethylbenzene, 2-chloro-1,4-diaminobenzene, 4-phenylaminoaniline, 1,4-diamino-2-methoxymethylbenzene, 4-dimethylaminoaniline, 4-diethylamino-aniline, 4-[di(2-hydroxyethyl)amino]aniline, 4-[(2-methoxyethyl)amino]-aniline, 4-[(3-hydroxypropyl)amino]aniline, 1,4-diamino-2-(2-hydroxyethyl)benzene, 1,4-diamino-2-(1-methylethyl)benzene, 1,3-bis-[(4-aminophenyl)-(2-hydroxyethyl)amino]-2-propanol, 1,8-bis-(2,5-diaminophenoxy)-3,6-dioxaoctane, 4-aminophenol, 4-amino-3-methylphenol, 4-methylaminophenol, 4-amino-2-(aminomethyl)phenol, 4-amino-2-[(2-hydroxyethyl)amino]-methylphenol, 4-amino-2-(methoxymethyl)phenol, 4-amino-2-(2-hydroxyethyl)phenol, 5-amino-salicylic acid, 2,5-diaminopyridine, 2,4,5,6-tetraamino-pyrimidine, 2,5,6-triamino-4-(1H)-pyrimidone, 4,5-diamino-1-(2-hydroxyethyl)-1H-pyrazole, 4,5-diamino-1-(1-methylethyl)-1H-pyrazole, 4,5-diamino-1-[(4-methylphenyl)-methyl]-1H-pyrazole, 1-[(4-chlorophenyl)methyl]-4,5-diamino-1H-pyrazole, 4,5-diamino-1-methyl-1H-pyrazole, 4,5-diamino-3-methyl-1-phenyl-1H-pyrazole, 4,5-diamino-1-(2-hydroxyethyl)-3-methyl-1H-pyrazole, 2-amino-phenol, 2-amino-6-methylphenol and 2-amino-5-methyl-phenol, or their salts.

Couplers: phenols, resorcinols and naphthol derivatives, such as: N-(3-dimethylaminophenyl)urea, 2,6-diaminopyridine, 2-amino-4-[(2-hydroxyethyl)amino]anisole,

2,4-diamino-1-fluoro-5-methylbenzene, 2,4-diamino-1-methoxy-5-methylbenzene, 2,4-diamino-1-ethoxy-5-methylbenzene, 2,4-diamino-1-(2-hydroxyethoxy)-5-methylbenzene, 2,4-di-[(2-hydroxyethyl)amino]-1,5-dimethoxybenzene, 2,3-diamino-6-methoxypyridine, 3-amino-6-methoxy-2-(methylamino)-pyridine, 2,6-diamino-3,5-dimethoxypyridine, 3,5-diamino-2,6-dimethoxypyridine, 1,3-diaminobenzene, 2,4-diamino-1-(2-hydroxyethoxy)benzene, 2,4-diamino-1-(3-hydroxypropoxy)benzene, 1-(2-aminoethoxy)-2,4-diaminobenzene, 2-amino-1-(2-hydroxyethoxy)-4-methylaminobenzene, 2,4-diaminophenoxyacetic acid, 3-[di(2-hydroxyethyl)amino]aniline, 4-amino-2-di[(2-hydroxyethyl)amino]-1-ethoxybenzene, 5-methyl-2-(1-methylethyl)phenol, 3-[(2-hydroxyethyl)amino]aniline, 3-[(2-aminoethyl)amino]aniline, 1,3-di(2,4-diaminophenoxy)propane, di-(2,4-diaminophenoxy)methane, 1,3-diamino-2,4-dimethoxybenzene, 2,6-bis-(2-hydroxyethyl)aminotoluene, 4-hydroxyindol, 3-dimethylaminophenol, 3-diethylaminophenol, 5-amino-2-methylphenol, 5-amino-4-fluoro-2-methylphenol, 5-amino-4-methoxy-2-methylphenol, 5-amino-4-ethoxy-2-methylphenol, 3-amino-2,4-dichlorophenol, 5-amino-2,4-dichlorophenol, 3-amino-2-methylphenol, 3-amino-2-chloro-6-methyl-phenol, 3-amino-phenol, 2-[(3-hydroxyphenyl)amino]acetamide, 5-[(2-hydroxyethyl)amino]-2-methylphenol, 3-[(2-hydroxyethyl)amino]-phenol, 3-[(2-methoxyethyl)amino]-phenol, 5-amino-2-ethylphenol, 2-(4-amino-2-hydroxyphenoxy)-ethanol, 5-[(3-hydroxypropyl)amino]-2-methylphenol, 3-[(2,3-dihydroxypropyl)-amino]-2-methyl-phenol, 3-[(2-hydroxyethyl)amino]-2-methylphenol, 2-amino-3-hydroxypyridine, 5-amino-4-chloro-2-methylphenol, 1-naphthol, 1,5-dihydroxy-naphthalene, 1,7-dihydroxy-naphthalene, 2,3-dihydroxynaphthalene, 2,7-dihydroxynaphthalene, 2-methyl-1-naphthol acetate, 1,3-dihydroxybenzene, 1-chloro-2,4-dihydroxybenzene, 2-chloro-1,3-dihydroxybenzene, 1,2-dichloro-3,5-dihydroxy-4-methylbenzene, 1,5-dichloro-2,4-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 3,4-methylenedioxyphenol, 3,4-methylenedioxy-aniline, 5-[(2-hydroxyethyl)amino]-1,3-benzodioxole, 6-bromo-1-hydroxy-3,4-methylenedioxybenzene, 3,4-diaminobenzoic acid, 3,4-dihydro-6-hydroxy-1,4(2H)-benzoxazine, 6-amino-3,4-dihydro-1,4(2H)-benzoxazine, 3-methyl-1-phenyl-5-pyrazolone, 5,6-dihydroxyindole, 5,6-dihydroxyindoline, 5-hydroxy-indole, 6-hydroxyindole, 7-hydroxy-indole and 2,3-indolindione, or their salts; and 2-amino-5-methylphenol; 2-amino-6-methylphenol, 2-amino-5-ethoxyphenol or 2-propylamino-5-aminopyridine.

The hair dye compositions of the present invention will generally comprise from 0.001% to 15%

by weight of dye precursors. For example compositions providing low intensity dyeing such as natural blond to light brown hair shades generally comprise from 0.001% to 7% by weight, preferably from 0.1% to 5% by weight, more preferably from about 0.2% to 2% by weight of dyeing composition of precursors and couplers. Darker shades such as browns and black typically comprise from 0.001% to 15% by weight, preferably from 0.05% to 10% by weight, more preferably from 1% to 5% by weight of precursors and couplers.

The developer substances and coupler substances are generally used in approximately equimolar amounts; however, it is not disadvantageous if the developer substances are present in this regard in a certain excess or deficit, for example a coupler:developer ratio of 1:3 to 1:0.3.

To achieve certain color shades, the agent for the oxidative coloring of keratin fibers (a) may also contain common natural and/or synthetic direct dyes, for example vegetable dyes such as henna or indigo, triphenylmethane dyes, aromatic nitro dyes, azo dyes, quinone dyes or cationic or anionic dyes.

The agent for the oxidative coloring of keratin fibers (a) will generally comprise from 0.001 percent to 10 percent by weight of direct dyes, preferably from 0.1 percent to 5 percent by weight, more preferably from 0.2 percent to 2 percent by weight.

Other common dyes known to be used for coloring hair and which can be contained in the colorant of the invention are described by, among others, E. Sagarin in pages 503 ff, by H. Janistyn in, "Handbuch der Kosmetika und Riechstoffe" [Handbook of Cosmetics and Fragrance Materials], vol. 3 (1973), pages 388 ff, and by K. Schrader in "Grundlagen und Rezepturen der Kosmetika" [Fundamentals and Formulations of Cosmetics], 2nd Edition (1989), pages 782-815.

If the agent according to the invention is the agent for the non-oxidative coloring of keratin fibers (b) (which is free of oxidative dye precursors and oxidizing agents) it contains at least one of the aforesaid direct dyes in the aforesaid amounts.

If the agent according to the invention is the agent for the simultaneously lightening and coloring of keratin fibers (c) it comprises at least one oxidizing agent (e.g. hydrogen peroxide or persulfates) and at least one dye that is stable in the presence of the used oxidizing agent.

As oxidation-stable dyes may be especially used the following dyes: 3-(2',6'-diaminopyridyl-3'-azo)pyridine (= 2,6-diamino-3-[(pyridin-3-yl)azo]pyridine), 2-((4-ethyl(2-hydroxyethyl)amino)-2-methylphenyl)azo-5-nitro-1,3-thiazole (Disperse Blue 106), N,N-di(2-hydroxyethyl)-3-methyl-4-[(4-nitrophenyl)azo]aniline (Disperse Red 17; C.I. 11210), 3-diethylamino-7-(4-dimethylaminophenylazo)-5-phenylphenazinium chloride (C.I. 11050), 4-(2-thiazolylazo)resorcinol, 4-[(4-phenylamino)azo]benzenesulfonic acid sodium salt (Orange IV), 1-[(3-aminopropyl)amino]-9,10-anthracenedione (HC Red No. 8), 3',3'',4,5,5',5'',6,7-octabromo-phenolsulfonphthalein (Tetrabromophenol Blue), 1-[(4-amino-3,5-dimethylphenyl)-(2,6-dichlorophenyl)methylene]-3,5-dimethyl-4-imino-2,5-cyclohexadienephosphoric acid (1:1) (Basic Blue 77), 3',3'',5'',5''-tetrabromom-cresolsulfon-phthalein, 2,4-dinitro-1-naphthol-7-sulfonic acid disodium salt (Acid Yellow 1; C.I. 10316), 4-[2'-hydroxy-1'-naphthyl]azo]benzene]sulfonic acid sodium salt (Acid Orange 7; C.I. 15510), 3',6'-dihydroxy-2',4',5',7'-tetraiodospiro[isobenzofuran-1(3H),9'(9H)xanthen]-3-one disodium salt (Acid Red 51; C.I. 45430), 6-hydroxy-5-[(2-methoxy-5-methyl-4-sulfophenyl)azo]-2-naphthalenesulfonic acid disodium salt (FD&C Red 40; C.I. 16035), 2,4-dinitro-1-naphthol sodium salt (Acid Yellow 24; C.I. 10315), 2',4',5',7'-tetrabromo-4,5,6,7-tetrachloro-3',6'-dihydroxyspiro{isobenzofuran-1(3H),9'[9H]xanthen}-3-one disodium salt (Acid Red 92; C.I. 45410), 4-(2-hydroxy-1-naphthylazo)-3-methylbenzenesulfonic acid sodium salt (Acid Orange 8; C.I. 15575), 2-amino-1,4-naphthalenedione, dithizone (1,5-diphenylthiocarbazone). Nevertheless it is also possible to use one or more of the aforementioned direct dyes if they are stable against the bleaching/oxidizing agent used.

Preferred bleaching agents are inorganic perhydrate salt bleaching compounds, such as the alkali metal salts of perborates, percarbonates, perphosphates, persilicates, persulphates and the like. Especially preferred are persulphate salts, such as ammonium persulfate, sodium persulfate or potassium persulfate. The bleaching agents are usually present in the agent (d) or (e) in an amount of from 5 to 65 percent by weight, preferably 20 to 50 percent by weight. The bleaching agents may especially be provided in the form of a non-aqueous cream or as a powder which is dissolved prior to use.

The agents (a), (c), (d) and (e) are used in combination with one or more known oxidants, whereas the bleaching agent (d) preferably comprises a combination of persulfates and hydrogen peroxide.

Any oxidizing agent known in the art (including air-oxygen and enzyme-based oxidizing systems) may be utilized in the present invention. Preferred water-soluble oxidizing agents are inorganic peroxygen materials capable of yielding hydrogen peroxide in an aqueous solution. Water-soluble peroxygen oxidizing agents are well known in the art and include hydrogen peroxide, inorganic alkali metal peroxides such as sodium periodate and sodium peroxide and organic peroxides such as urea peroxide, melamine peroxide. These inorganic perhydrate salts may be incorporated as monohydrates, tetrahydrates etc. Alkyl and aryl peroxides, and or peroxidases may also be used. Mixtures of two or more such oxidizing agents may also be used if desired.

The oxidizing agents may be provided in aqueous solution or as a powder which is dissolved prior to use. Especially preferred for use in the compositions according to the present invention is hydrogen peroxide, alone or in combination with other oxidants.

According to the present invention the compositions comprise from 0.1% to 15% by weight, preferably from 1% to 10% by weight, and most preferably from 2% to 7% by weight of an oxidizing agent.

Another preferred oxidizing agent for use herein is a source of peroxydicarbonate ions. Preferably such a source is formed in situ from a source of hydrogen peroxide and a hydrogen carbonate ion source. Such an oxidizing agent has been found to be particularly effective at a pH of up to and including 9.5, preferably 7.5 to 9.5 more preferably pH 9. Moreover, this system is also particularly effective in combination with a source of ammonia or ammonium ions. It has been found that this oxidizing agent can deliver improvements to the desired hair colour results particularly with regard to the delivery of high lift, whilst considerably reducing the odour, skin and scalp irritation and damage to the hair fibres.

According to the present invention the compositions comprise from 0.1% to 15% by weight, preferably from 1% to 10% by weight, and most preferably from 1% to 8% by weight of a hydrogencarbonate ion and from 0.1% to 10% by weight, preferably from 1% to 7% by weight, and most preferably from 2% to 5% by weight of a source of hydrogen peroxide.

According to the present invention the composition may further optionally comprise at least one source of alkalizing agent, preferably a source of ammonium ions and or ammonia. Any agent known in the art may be used such as alkanolamides for example monoethanolamine, diethanolamine, triethanolamine, monopropanolamine, dipropanolamine, tripropanolamine, 2-amino-2-methyl-1, 3-propanediol, 2-amino-2-methyl-1-propanol, and 2-amino-2-hydroxymethyl-1,3-propanediol and guanidium salts. Particularly, preferred alkalizing agents are those which provide a source of ammonium ions. Any source of ammonium ions is suitable for use herein. Preferred sources include ammonium chloride, ammonium sulphate, ammonium nitrate, ammonium phosphate, ammonium acetate, ammonium carbonate, ammonium hydrogen carbonate, ammonium carbamate, ammonium hydroxide, ammonia and mixtures thereof. Particularly preferred are ammonium carbonate, ammonium carbamate, ammonium hydrogen carbonate, ammonia and mixtures thereof. The compositions of the present invention may comprise from 0.1% to 10% by weight, preferably from 0.5% to 5% by weight, most preferably from 1% to 3% by weight, of an alkalizing agent, preferably ammonium ions.

According to the present invention the compositions may further comprise a source of radical scavenger. As used herein the term radical scavenger refers to a species that can react with a reactive radical, preferably carbonate radicals, to convert the reactive radical by a series of fast reactions to a less reactive species.

Preferred radical scavengers according to the present invention are selected from the classes of alkanolamines, amino sugars, amino acids, esters of amino acids and mixtures thereof. Particularly preferred compounds are: monoethanolamine, 3-amino-1-propanol, 4-amino-1-butanol, 5-amino-1-pentanol, 1-amino-2-propanol, 1-amino-2-butanol, 1-amino-2-pentanol, 1-amino-3-pentanol, 1-amino-4-pentanol, 3-amino-2-methylpropan-1-ol, 1-amino-2-methylpropan-2-ol, 3-aminopropane-1,2-diol, glucosamine, N-acetylglucosamine, glycine, arginine, lysine, proline, glutamine, histidine, sarcosine, serine, glutamic acid, tryptophan, and mixtures thereof, and the salts such as the potassium, sodium and ammonium salts thereof and mixtures thereof. Especially preferred compounds are glycine, sarcosine, lysine, serine, 2 methoxyethylamine, glucosamine, glutamic acid, morpholine, piperdine, ethylamine, 3 amino-1-propanol and mixtures thereof.

The radical scavengers according to the present invention preferably have a molecular weight of less than 500, preferably less than 300, more preferably less than 250 in order to facilitate penetration of the radical scavenger into the hair fibre. The compositions of the present invention preferably comprise from 0.1% to 10% by weight, preferably from 1% to 7% by weight of radical scavenger. The radical scavenger is also preferably selected such that it is not an identical species as the alkalizing agent. According to one embodiment of the present invention the radical scavenger may be formed insitu in the hair dyeing compositions prior to application to the hair fibres.

The compositions of the present invention may further comprise additional ingredients which include, but are not limited to, additional thickeners other than the above mentioned special anionic acrylic thickener, solvents, enzymes, surfactants, conditioning agents, carriers, antioxidants or reducing agents, stabilizers, chelants, perfumes, hair swelling agents and/or polymers. Some of these additional components are detailed hereafter.

The pH of the agent for the non-oxidative coloring of keratin fibers based on direct dyes, the pH of the colorant of the invention is in the range from 5 to 10 and preferably from 6 to 9, whereas the pH of the agent for the oxidative coloring of keratin fibers based on oxidation dye precursors is from 6 to 12 and preferably from 9 to 11. The pH of the ready-to-use oxidation hair colorant (namely of the mixture of the hair colorant of the invention and the oxidant) and the ready-to-use agent for the simultaneously lightening and coloring of keratin fibers is from 5,5 to 10 and preferably from 6 to 9. The pH of the ready-to-use agent for the bleaching of keratin fibers is from 8 to 12 and preferably from 9 to 11.5.

Depending on the composition and the desired pH, the pH is preferably adjusted with ammonia or an organic amine, for example glucamine, aminomethylpropanol, monoethanolamine or triethanolamine, with an inorganic base, for example sodium hydroxide, potassium hydroxide, sodium carbonate or calcium hydroxide, or with an organic or inorganic acid, for example lactic acid, citric acid, acetic acid or phosphoric acid.

The ready-to-use compositions may be, for example, a solution, especially an aqueous or aqueous-alcoholic solution. However a particularly preferred form of the composition according to the invention is a cream, a gel or an emulsion. Its composition comprises a mixture of the dye

and/or lightening/bleaching ingredients with the conventional additive ingredients usually used in this type of preparation.

According to a preferred embodiment of the present invention dye powders or dye granules or bleaching powders or bleaching granules are mixed with an appropriate carrier mass prior to use to form the ready-to-use composition. Particularly preferred is the use of pellets as described in WO 2005/044208 which are mixed with an appropriate carrier mass prior to use to form the ready-to-use composition. WO 2005/044208 herewith is explicitly incorporated herein by reference.

To attain simultaneous lightening and coloring of the fibers, the dye-containing pellets of the invention can also contain an ammonium carbonate, for example ammonium hydrogen carbonate, or an amino acid or a salt thereof, for example sodium glycinate.

Depending on the intended use, the composition (a), (b), (c), (d) or (e) according to the invention can be used with one or more oxidizing agents (lightening/bleaching; oxidation colorants) or without an oxidizing agent (non-oxidative colorants).

When used for the oxidative dyeing of keratin fibers, the afore described composition (a) is mixed with an oxidant just before use, and an amount of the ready-to-use mixture sufficient for dyeing, as a rule 60 to 200 grams, is applied to the fibers.

If the colorant of the invention contains no oxidation dye precursors or if it contains oxidation dye precursors that are readily oxidized by atmospheric oxygen, said colorant can be applied to the keratin fibers directly without previous mixing with an oxidant.

Suitable oxidants for developing the coloration are described above, whereas a hydrogen peroxide, or its addition compounds with urea, melamine or sodium bromate, in the form of a 1 to 12 percent by weight, preferably 6 percent by weight, aqueous solution, is preferred as the oxidizing agent. The mixing ratio of composition (a) to oxidant depends on the concentration of the oxidant and as a rule is 5:1 to 1:2 and preferably 1:1, the amount of oxidant in the ready-to-use composition being preferably 0.5 to 8 weight percent and particularly 1 to 4 weight percent.

The ready-to-use colorant is allowed to act on the keratin fibers (for example human hair) at 15 °C to 50 °C for 10 to 45 minutes and preferably for 15 to 30 minutes after which the fibers are rinsed with water and dried. Optionally, following this rinsing, the keratin fibers are washed with

a shampoo and possibly post-rinsed with a weak organic acid, for example tartaric acid. The keratin fibers are then dried.

The agent for the simultaneously lightening and coloring of keratin fibers (c) or (e) as well as the agent for the bleaching of keratin fibers (d) is normally used in the form of multi-component-kits, especially two-component-kits, wherein one component contains the oxidant and the other contains the dyes or the bleaching agents. Prior to use the components are mixed with each other and an amount of the ready-to-use mixture sufficient for coloring and/or lightening/bleaching the keratin fibers, as a rule 60 to 200 grams, is applied to the fibers. The ready-to-use composition is allowed to act on the keratin fibers (for example human hair) at 15 °C to 50 °C for 10 to 45 minutes and preferably for 15 to 30 minutes after which the fibers are rinsed with water and dried. Optionally, following this rinsing, the keratin fibers are washed with a shampoo and possibly post-rinsed with a weak organic acid, for example tartaric acid. The keratin fibers are then dried.

If necessary, the viscosity of the ready-to-use compositions (a), (b), (c) or (d) can be increased by adding an appropriate amount of the above described anionic acrylic thickener of the invention to the composition. It is also possible to thicken oxidative or non-oxidative colorants or agents for simultaneously lightening and dyeing keratin fibers or agents for bleaching keratin fibers by addition of the above described anionic acrylic thickener of the invention just prior to use. This provides simpler and more economical basic formulations.

The above described compositions (a), (b), (c) or (d) meet the requirements in terms of adhesion properties, application characteristics and viscosity adjustment in outstanding manner and are clearly easier to apply. Moreover, the above described compositions (a), (b), (c) or (d) have a uniform consistency and are cosmetically appealing. Particularly notable is the very good viscosity and outstanding stability of the above described compositions (a), (b), (c) or (d) and their excellent adhesion to hair. Furthermore, the use of the above described compositions (a), (c) or (d) makes it possible to vary the weight ratio of colorant to oxidant over a wide range (for example from 1:1 to 1:2.5) without adversely affecting the viscosity and adhesion properties of the ready-to-use oxidation colorant in an appreciable manner.

The following examples are intended to explain the subject matter of the invention more closely without limiting its scope.

EXAMPLES

Example 1: Oxidation Hair Colorant, Liquid

0.5000 g	ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
5.0000 g	2-octyl-1-dodecanol (Eutanol G, supplied by Cognis/Germany)
15.0000 g	oleic acid
10.0000 g	sodium lauryl alcohol diethylene glycol ether sulfate (28% aqueous solution)
1.3620 g	4-aminophenol
0.5000 g	1-naphthol
0.0136 g	resorcinol
0.0034 g	2-amino-6-chloro-4-nitrophenol
12.0000 g	ammonia, 25% aqueous solution
1.0000 g	disodium ethylenediaminetetraacetate
1.0000 g	ascorbic acid
15.0000 g	isopropanol
ad 100.0000 g	water

Just before use, 50 g of the foregoing hair colorant was mixed with 50 g of a 6% aqueous hydrogen peroxide solution. This gave a homogeneous, cosmetically appealing, optimally thickened, colorant formulation. The mixture thus obtained was then applied to naturally blond hair. After an exposure time of 30 min at 40 °C., the hair was rinsed with water and dried. The hair showed a bright copper-red coloration.

Example 2: Oxidation Hair Colorant in Gel Form

Component (A): Liquid Dye Carrier Composition

1.20 g	ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
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10.00 g	of lauryl alcohol
6.00 g	nonylphenol ethoxylated with 4 moles of ethylene oxide
6.00 g	oleic acid
0.62 g	2-(methoxymethyl)-benzene-1,4-diamine
0.28 g	resorcinol
5.00 g	sodium lauryl alcohol diethylene glycol ether sulfate, 28% aqueous solution
1.00 g	disodium ethylenediaminetetraacetate
18.00 g	ammonia, 25% aqueous solution
8.00 g	ethanol
ad 100.00 g	water
Component (B):	Hydrogen Peroxide Emulsion
10.0 g	cetylstearyl alcohol
1.5 g	cholesterol
4.0 g	sodium lauryl alcohol diethylene glycol ether sulfate, 28% aqueous solution
35.0 g	hydrogen peroxide, 35% aqueous solution
0.3 g	perfume
ad 100.0 g	water

Before use, 40 g of the liquid dye carrier composition (A) was mixed with 80 g of the hydrogen peroxide emulsion (B), corresponding to an (A):(B) mixing ratio of 1:2, and 120 g of this mixture was applied to gray human hair. After an exposure time of 20 min at room temperature, the hair was rinsed with water and dried. The hair treated in this manner was colored uniformly brown from hairline to hair tips. The colorant of the invention was easily applied and did not run off the hair.

Example 3: Oxidation Hair Colorant in Cream Form

0.40 g	sodium acrylate/sodium acryloyldimethyl taurate copolymer
3.00 g	oleyl alcohol
15.00 g	cetyl alcohol
3.50 g	sodium lauryl alcohol diethylene glycol ether sulfate (28% aqueous solution)
3.00 g	monoethanolamine
1.30 g	1-methyl-2,5-diaminobenzene
1.00 g	beeswax
0.65 g	resorcinol
0.50 g	keratin hydrolyzate
0.50 g	silk protein hydrolyzate
0.50 g	2-amino-6-chloro-4-nitrophenol
0.30 g	ascorbic acid
ad 100.00 g	water

Just before use, 50 g of the foregoing hair colorant was mixed with 50 g of 12% aqueous hydrogen peroxide solution. The resulting mixture was then applied to naturally blond hair. After an exposure time of 30 min at 40 °C., the hair was rinsed with water and dried. A uniform, strong brown shade was obtained.

Example 4: Hair Tinting Agent (Non-Oxidative)

2.5 g	ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
6.0 g	lauryl alcohol
5.0 g	sodium lauryl sulfate
1.5 g	2-amino-6-chloro-4-nitrophenol
1.0 g	monoethanolamine
1.0 g	beeswax
0.5 g	keratin hydrolyzate
0.3 g	silk protein hydrolyzate

0.2 g glycine
ad 100.0 g water

A slightly gelled colorant composition was obtained which because of its outstanding viscosity characteristics was easily and uniformly applied and adhered well to the hair. After an exposure time of 20 min at 20 °C., the hair was rinsed with luke-warm water, styled and dried. The hair treated in this manner showed a uniform, very lustrous gold-orange coloration.

Example 5: Oxidative Colorant

Component (A): Dye Carrier Composition

4.0 g ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
8.0 g 2-octyl-1-dodecanol (Eutanol G, supplied by Cognis/Germany)
3.0 g sodium lauryl alcohol diethylene glycol ether sulfate (28% aqueous solution)
2.8 g 2,5-diaminotoluene sulfate
1.0 g resorcinal
0.4 g m-aminophenol
0.2 g 2-amino-4-(2'-hydroxyethylamino)anisole sulfate
0.3 g ascorbic acid
0.1 g ethylenediaminetetraacetic acid
12.2 g ammonia, 25% aqueous solution
2.0 g ethanol
ad 100.0 g water

Component (B): Hydrogen Peroxide - Emulsion

10.0 g cetylstearyl alcohol
1.5 g cholesterol
4.0 g sodium lauryl alcohol diethylene glycol ether sulfate, 28% aqueous solution
17.0 g hydrogen peroxide, 35% aqueous solution
0.3 g perfume
ad 100.0 g water

Before use, 40 g of the liquid dye carrier composition (A) was mixed with 80 g of the hydrogen peroxide emulsion (B), corresponding to an (A):(B) mixing ratio of 1:2, and 120 g of this mixture was applied to human hair. After an exposure time of 20 min at room temperature, the hair was rinsed with water and dried. The hair treated in this manner was of a uniform, dark-brown shade. The colorant of the invention adhered very well to the hair without running off.

Example 6: Colorant for Simultaneously Lightening and Coloring Hair

Component (A): Dye Carrier Composition

4.0 g	ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
2.0 g	4-dimethylaminophenylazo-2N-methyl-5N-methyl-imidazolium chloride
8.0 g	2-octyl-1-dodecanol (Eutanol G, supplied by Cognis/Germany)
3.0 g	sodium lauryl alcohol diethylene glycol ether sulfate (28% aqueous solution)
8.0 g	ammonia, 25% aqueous solution
0.1 g	ethylenediaminetetraacetic acid
2.0 g	ethanol
ad 100.0 g	water

Component (B): Hydrogen Peroxide - Emulsion

10.0 g	cetylstearyl alcohol
1.5 g	cholesterol
4.0 g	sodium lauryl alcohol diethylene glycol ether sulfate, 28% aqueous solution
17.0 g	hydrogen peroxide, 35% aqueous solution
0.3 g	perfume
ad 100.0 g	water

Before use, 40 g of the liquid dye carrier composition (A) was mixed with 40 g of the hydrogen peroxide emulsion (B), corresponding to an (A):(B) mixing ratio of 1:1, and this mixture was applied to human hair. After an exposure time of 10 min at room temperature, the hair was rinsed with water and dried. The colorant of the invention adhered very well to the hair without running off.

Example 7: Colorant for Simultaneously Lightening and Coloring Hair

Lightening Powder (A):

20.0 g	potassium persulfate
30.0 g	ammonium persulfate
24.0 g	sodium silicate
12.5 g	magnesium oxide
6.0 g	soap beads
2.0 g	dispersed silicic acid
0.5 g	ethylenediaminetetraacetic acid disodium salt
0.1 g	Acid Red 92 (CI 45410)
0.2 g	Acid Yellow 1(CI 10316)
0.8 g	Acid Yellow 24 (CI 10315)
1.0 g	Acid Orange No 8 (CI 15575)
1.0 g	Acid Orange No 7 (CI 15510)

Thickener (B):

100,00 g	ViscUp®EZ of Arch Personal Care Products, South Plainfield, USA ¹⁾
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Before use, 40 g of the above lightening powder (A) was mixed with 80 g of a 12% aqueous hydrogen peroxide solution (C) and 5 g of the above thickener (B) to form a homogeneous composition. This mixture was applied to dry human hair. After an exposure time of 20 min at 40 °C, the hair was rinsed with warm water and dried. The hair treated in this manner was of a uniform, bright orange shade. The colorant of the invention adhered very well to the hair without running off.

¹⁾ ViscUp®EZ is a mixture of 35-55% Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymer and 23-35% Hydrogenated Polydecene and 20-30% Sorbitan Laurate and 5-10% Trideceth-6

Unless otherwise indicated, all percentages in the present patent application are by weight.

The dimensions and values disclosed herein are not to be understood as being strictly limited to

the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm” is intended to mean “about 40 mm”.

What is claimed is:

1. An agent for the oxidative coloring of keratin fibers, comprising at least one oxidative dye precursor, characterized in that it comprises at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer.
2. An agent for the non-oxidative coloring of keratin fibers, comprising at least one direct dye, characterized in that it comprises at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer.
3. An agent for the simultaneously lightening and coloring of keratin fibers, comprising at least one bleaching agent and at least one dye which is stable in the presence of the used oxidizing agent, characterized in that it comprises at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer.
4. An agent for the bleaching of keratin fibers, comprising at least one bleaching agent, characterized in that it comprises at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer.
5. An agent for the simultaneously lightening and coloring of keratin fibers, which is mixed

with an oxidizing agent prior to use, comprising at least one dye which is stable in the presence of the used oxidizing agent, characterized in that it comprises at least one anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer.

6. An agent according to one of claims 1 to 5, characterized in that the monomer performing a weak acid function is selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, maleic acid and fumaric acid.

7. An agent according to one of claims 1 to 6, characterized in that the monomer performing a strong acid function is selected from the group consisting of monomers having a function of the sulfonic acid type or phosphonic acid type, such as 2-acrylamido-2-methylpropane sulfonic acid.

8. An agent according to one of claims 1 to 7, characterized in that the anionic acrylic polymer is crosslinked or branched by a crosslinking agent which is selected from the group consisting of methylene bisacrylamide, ethylene glycol diacrylate, polyethylene glycol dimethacrylate, diacrylamide, cyanomethacrylate, vinyloxyethacrylate, methacrylate, formaldehyde, glyoxal, compositions of the glycidylether type and epoxydes.

9. An agent according to one of claims 1 to 8, characterized in that the anionic acrylic thickener is a Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymer.

10. An agent according to claim 9, characterized in that the anionic acrylic thickener is Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymer & Hydrogenated Polydecene & Sorbitan Laurate & Trideceth-6.

11. An agent according to one of claims 1 to 10, characterized in that the anionic acrylic thickener is in an amount from 0.01 to 8.0 percent by weight, based on the active substance.

12. An agent according to one of claims 1 to 11, characterized in that the keratin fiber is human hair.

13. Use of an anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer, for the thickening of compositions for the oxidative or non-oxidative dyeing of keratin fibers, compositions for the simultaneously lightening and coloring of keratin fibers or compositions for the bleaching of keratin fibers.

14. A method for thickening compositions for the oxidative or non-oxidative dyeing of keratin fibers, compositions for the simultaneously lightening and coloring of keratin fibers or compositions for the bleaching of keratin fibers, characterized in that an appropriate amount of an anionic acrylic thickener obtained by polymerization of (i) 5 to 95 molar percent of at least one monomer performing a weak acid function, and of (ii) 5 to 95 molar percent of at least one monomer performing a strong acid function, wherein such composition exhibits a fraction of water-soluble polymers ranging from 5 to 50 percent by weight of the total polymer is added to the composition prior to use.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2008/050611

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61Q5/06 A61Q5/10 A61Q5/08 A61K8/81

According to 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 practical, search terms used)

EPO-Internal, 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 2004/143912 A1 (L'OREAL) 29 July 2004 (2004-07-29) paragraph [0014] - paragraph [0017]; examples	1,3-5,7
Y	WO 01/97772 A (SNF SA) 27 December 2001 (2001-12-27) page 3, line 22 - page 8, line 13	1-14
Y	WO 99/36445 A (SEPPIC) 22 July 1999 (1999-07-22) example 1	6-8
Y	US 2006/084586 A1 (INTERNATIONAL SPECIALITY PRODUCTS) 20 April 2006 (2006-04-20) paragraph [0009] - paragraph [0019] paragraph [0492]	1-14

Further documents are listed in the continuation of Box C.

See patent family annex.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2008/050611

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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