Title: COMPOSITION FOR HAIR COLOR AND PREPARATION METHOD THEREOF

Abstract: Disclosed herein are a hair dye composition and a method of preparing the composition. The hair dye composition comprises a Mori Folium water extract, a Mori Folium fermentation extract, a Mori Cortex Radicis fermentation extract, a Lonicerae Flos fermentation extract, a Glycyrrhizae Radix fermentation extract, a Codonopsis Radix fermentation extract, a Rhyzochisia molubilis fermentation extract, a Coptidis Rhizoma fermentation extract, sulfur, a dye, a base, and purified water. The composition does not develop irritation reactions on the scalp, removes itchiness, rapidly repairs damaged hair fibers, and gives a long-lasting glossy sheen by imparting elasticity and providing nutrients to the hair. 
Description

COMPOSITION FOR HAIR COLOR AND PREPARATION

METHOD THEREOF

Technical Field
[1] The present invention relates to a hair dye composition for improving the scalp and hair, which does not cause irritation reactions on the scalp, alleviates itchiness, rapidly repairs damaged hair fibers, and gives a long-lasting glossy sheen by providing elasticity and nutrients to the hair. The present invention is also concerned with the method of preparing the composition.

Background Art
[2] Dyes for coloring hair fibers are typically divided into three major types: temporary, semi-permanent and permanent. Permanent hair dyes are classified into oxidative hair dye, metallic hair dye, vegetable hair dye, and the like according to the type of dye used.

[3] In practice, hair dye products comprise two parts: a first composition, in which an oxidative dye, a direct dye, or the like is mixed with an alkaline agent, and a second composition, composed of hydrogen peroxide. The first and second parts are mixed at a predetermined ratio immediately before application to the hair. The alkaline agent in the first composition swells the hair to facilitate the diffusion and penetration of the dye into hair fibers, and degrades hydrogen peroxide when mixed with the second composition to generate oxygen required for oxidation of the dye, thereby leading to desired hair coloring.

[4] However, hair dye formulations are apt to cause allergic reactions on the skin, and damage to the hair by dissolving components of the hair due to their strong acidic or alkaline ingredients. In addition, the dye is often deposited in the hair through oxidative polymerization, making the hair less glossy and less brilliant and causing severe damage to the hair. In this case, the hair takes on an unnatural color and turns rough.

[5] Moreover, dyes, which make colors, may be very irritating to the mucous glands and eyes, causing hypersensitive reactions, may cause rashes due to contact dermatitis from the face to the neck, may cause fevers and asthma, and in severe cases, may bring about burns and hair loss.

[6] This is because paraphenylamine, diaminotoluence, diaminoanisole, and the like, which are major ingredients of dyes for hair coloring, are somewhat toxic to the skin, or cause allergic reactions on the skin.

Disclosure of Invention
Technical Problem

[7] In order to solve the problems encountered in the prior art, the present invention aims to provide a hair dye composition for improving the scalp and hair comprising natural extracts and sulfur, the composition not developing irritation reactions on the scalp, removing itchiness, rapidly repairing damaged hair fibers, and giving a long-lasting glossy sheen by providing elasticity and nutrients to the hair, and a method of preparing the composition.

Technical Solution

[8] In order to accomplish the above objects, the present invention provides a hair dye composition comprising a Mori Folium water extract, a Mori Folium fermentation extract, a Mori Cortex Radicis fermentation extract, a Lonicerae Flos fermentation extract, a Glycyrrhizae Radix fermentation extract, a Codonopsis Radix fermentation extract, a Rhynchosis molubilis fermentation extract, a Coptidis Rhizoma fermentation extract, sulfur, a dye, a base, and water.

[9] The hair dye composition comprises the Mori Folium water extract in an amount from 0.01% to 5.0% by weight, the Mori Folium fermentation extract in an amount from 0.01% to 5.0% by weight, the Mori Cortex Radicis fermentation extract in an amount from 0.01% to 5.0% by weight, the Lonicerae Flos fermentation extract in an amount from 0.01% to 5.0% by weight, the Glycyrrhizae Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Codonopsis Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Rhynchosis molubilis fermentation extract in an amount from 0.01% to 5.0% by weight, the Coptidis Rhizoma fermentation extract in an amount from 0.01% to 5.0% by weight, the sulfur in an amount from 0.5% to 1.5% by weight, the dye in an amount from 0.001% to 5.0% by weight, the base in an amount from 10% to 40% by weight, and water up to 100% by weight, based on the total weight of the composition.

Best Mode for Carrying Out the Invention

[10] Hereinafter, the present invention will be described in more detail.

[11] The hair dye composition according to the present invention is characterized in that a plant water extract and various plant fermentation extracts are dissolved in water obtained by immersing loess in water (the water is called "Jijangs" in Korea, and is referred to herein simply as "loess water"), and that it thus does not develop irritation reactions on the scalp, prevents itchiness, rapidly repairs damaged hair fibers, and gives a long-lasting glossy sheen by providing elasticity and nutrients to the hair.

[12] The aqueous plant extract is obtained from Mori Folium, which is the leaf of a mulberry tree, Moras alba, and other mulberry trees. Mori Folium promotes hair growth, makes the hair glossy and removes dandruff, and is called a "natural hair
tonic" in folk medicine due to such effects. To utilize the efficacy of Mori Folium in the present invention, a water extract of Mori Folium is prepared.

The water extract of Mori Folium was prepared as follows. Leaves collected from Morus alba are dried in the shade, ground to powder, and transferred into a container. After the container is tightly sealed, Morus alba leaf powder is ripened at a low temperature for a period from 30 to 60 days, and extracted with 5 to 10 times the weight of water relative to the weight of the powder. The Mori Folium water extract thus obtained has a strong alkaline pH ranging from 13 to 14, and serves as a natural antiseptic, which is not harmful to humans.

The Mori Folium water extract is preferably used in an amount of 0.01% to 5.0% by weight, based on the total weight of the hair dye composition.

The plant fermentation extracts according to the present invention are obtained from Mori Folium, Mori Cortex Radicis, Lonicerae Flos, Glycyrrhizae Radix, Codonopsis Radix, Rhynchosia molubilis, and Coptidis Rhizoma.

Mori Cortex Radicis, which is the root bark of a mulberry tree, particularly Morus alba, contains flavonoids, tannins, scoporetin, and insect hormones, such as ecdyson, and incosterone, makes the hair glossy, and helps hair growth.

Lonicerae Flos, which is prepared from the dried flower buds of Lonicera japonica, contains tanin, rutin, inoyctol and flavonoids, and has anti-inflammatory and antimicrobial actions, which relieve skin irritation due to hair dyes.

Glycyrrhizae Radix, which is prepared from the sun-dried roots and rhizomes of Glycyrrhiza uralensis, which is a perennial herb belonging to the bean family, is used as a herbal medicine in Chinese medicine and folk medicine. Glycyrrhizae Radix contains a variety of ingredients, such as glycyrrhizin, triterpenoid, glycon, polyphenol, glabridin, and polysaccharides, and has anti-inflammatory effects.

Codonopsis Radix, which is prepared from the roots of Adenophora triphylla, contains saponin, inulin, phytoderin, leothin, pentoas, and other pharmaceutical ingredients, and has an effect of preventing hair loss.

Rhynchosia molubilis, which is a black bean called "Yak-Kong" in Korea, meaning a bean having medicinal efficacy, has an excellent effect of promoting blood circulation and thus has an effect of repairing damaged hair fibers.

Coptidis Rhizoma, which is prepared from the roots of Coptis chinensis, which is a perennial herb belonging to the Ranunculaceae family, contains berberine and alkaloids, which are useful in yellow staining, particularly gold yellow staining, and has anti-inflammatory effects.

The plant fermentation extracts according to the present invention are prepared as follows. Mori Folium, Mori Cortex Radicis, Lonicerae Flos, Glycyrrhizae Radix, Codonopsis Radix, Rhynchosia molubilis, and Coptidis Rhizoma are individually
cleaned with water, mixed with 0.5 to 2 times their weight of sugar (unrefined black sugar) for microbial fermentation, tightly sealed, and ripened at room temperature for a period from one to eight months, preferably three to six months. The ripening is based on microbial fermentation, and harmful gas generated during ripening is removed. Thereafter, ripened products are extracted with water to obtain each plant fermentation extract.

The plant fermentation extracts thus obtained are used in an amount from 0.07% to 35.0% by weight based on the total weight of the hair dye composition. In detail, the Mori Folium fermentation extract is used in an amount from 0.01% to 5.0% by weight, the Mori Cortex Radicis fermentation extract in an amount from 0.01% to 5.0% by weight, the Loniceræ Flos fermentation extract in an amount from 0.01% to 5.0% by weight, the Glycyrrhizae Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Codonopsis Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Rhynchosia molubilis fermentation extract in an amount from 0.01% to 5.0% by weight, and the Coptidis Rhizoma fermentation extract in an amount from 0.01% to 5.0% by weight, based on the total weight of the composition.

In addition to the plant water extract and the plant fermentation extracts, the hair dye composition of the present invention comprises sulfur.

The hair consists mainly of sulfur-containing protein called keratin, and the cuticle, which is the outer layer of hair, has a water content of about 8-10%. Melanin granules give the hair a natural color. When sulfur is deficient in the hair, the hair loses its gloss and becomes brittle due to its decreased elasticity. In this regard, the present invention employs sulfur in the hair dye composition to provide elasticity and nutrients to the hair, thereby giving a long-lasting glossy sheen to the hair, and to suppress or remove toxic effects, such as scalp itchiness and allergic reactions.

Purified sulfur, after being commercially obtained, is used in a state of being dissolved in distilled water. Alternatively, as was done historically, sulfur is heated in loess water and filtered. This heating and filtering process is carried out 7 to 15 times. Ginger juice is then added in an amount from 0.05 to 0.2 times the weight of the loess, and the heating and filtering process is repeated 7 to 15 times. The loess water used may also be added to the hair dye composition.

In one embodiment of the present invention, the sulfur and loess water purified according to the following process are used.

First, loess is immersed in water to obtain loess water, and sulfur is added to the loess water in an amount from 0.1 to 0.5 times the weight of the loess. The resulting mixture is heated for one to five hours and filtered. The filtered particles are supplemented with water and heated. This heating and filtering process is carried out 7 to 15 times, preferably 9 or 10 times, to obtain sulfur-containing loess water. Then, ginger
juice is added to the sulfur-containing loess water in a 0.05 to 0.2 times weight relative to the loess, and the heating and filtering process is repeated 7 to 15 times, preferably 9 or 10 times, to obtain sulfur powder. The loess water used in the second heating process is recovered and used for preparing the hair dye composition according to the present invention.

The sulfur thus obtained is used in an amount from 0.5% to 1.5% by weight based on the total weight of the hair dye composition. When the content of sulfur is lower than this range, the effects of suppressing scalp itchiness or allergic reactions after hair coloring are difficult to achieve. When the sulfur content exceeds the range, increased effects are not obtained, and excessive sulfur interrupts deposition of the dye on the hair. For these reasons, the sulfur is suitably used within the above range.

The aforementioned natural fermentation extracts and sulfur, through mixing with a dye and a base of the type commonly used in hair dye formulations, enables the preparation of a hair dye formulation removing scalp itchiness, rapidly repairing damaged hair fibers and giving a long-lasting glossy sheen by providing elasticity and nutrients to the hair.

The dye useful in the present invention may be a commonly used oxidative dye. Examples of oxidative dyes include, but are not limited to, p-phenylenediamine, o-phenylenediamine, resorcin, 2-methylresorcinol, m-phenylenediamine, m-aminophenol, o-aminophenol, p-aminophenol, toluenediamines, aminonitrophenols, diphenylamines, N-phenyldiamines, diaminopyridines, and salts thereof. The dye used in the present invention may be one or more selected from the exemplified compounds. The dye content in the present composition is within a typical range. For example, the dye is used in an amount of 0.001% to 5.0% by weight based on the total weight of the hair dye composition.

The base may be one or more selected from among propylene glycol, cetearyl alcohol, polyethylene oleyl ether, polyethylene cetly ether, stearamide MEA, oleic acid, oleyl alcohol, dimethicone, behenyl alcohol, and glyceryl stearate. The base is used in an amount from 10% to 40% by weight, preferably 10% to 30% by weight, based on the total weight of the hair dye composition.

The hair dye composition having such a composition according to the present invention may further include ingredients combinable with a general agent externally applied to the hair according to the intended use. Examples of such additives include a hair protective agent, a chelating agent, a surfactant, a pH adjusting agent, an alkali-fying agent, a moisturizing agent, a thickening agent, an antiseptic, an antioxidant, a disinfecting agent, an anti-inflammatory agent, an antimicrobial agent, a solvent, a flavoring agent, and a pigment. These additives are suitably used within an ordinary range by those having ordinary skill in the art.
The hair protective agent helps the dye adhere to the hair surface, prevents hair damage by forming a water-repellent thin layer, which retards dye removal due to rinsing and sunlight, and thus having a conditioning effect on the hair surface, and contributes emulsion stabilization. A hair protective agent suitable for used in the present invention may be one or more selected from among sodium methyl stearoyl taurate, hydrolyzed keratin, tocopheryl acetate, cetrimonium chloride, glyceryl stearate, PEG-11 methyl ether dimethicone, cyclomethicone, ammonium glycyrrhizate, glycercylinoleate, linoleic acid, ceramide, mineral oils, polyquaternium-10, camellia oil, and the like.

The chelating agent includes disodium EDTA and tetrathionate EDTA, and serves as a metal blocking agent.

The pH adjusting agent may be any one of organic acids, such as citric acid, succinic acid, tartaric acid, lactic acid, malic acid, fumaric acid, maleic acid and glycolic acid, and inorganic acids, such as hydrochloric acid, sulfuric acid, phosphoric acid and nitric acid. Also, a combination of sodium salts, potassium salts or ammonium salts of the acids may be available. Sodium hydroxide and potassium hydroxide may be also available.

A suitable alkaliifying agent is monoethanolamine or strong aqueous ammonia, which facilitate the penetration of dye molecules into the hair by swelling the hair.

A solubilizer may be, in detail, isopropyl myristate, polyethylene glycol, medium chain fatty acid triglycerides, hydrocarbons, glycols, and the like.

Examples of anion surfactants among surfactants may include ammonium lauryl sulphosuccinate, ammonium lauryl sulfate, sodium cocoyl isethionate, sodium lauryl isethionate, sodium lauryl sulfate, triethanolamine lauryl sulfate, and sodium lauryl ether sulfate (1-3 ethylene oxides).

Examples of moisturizing agents may include glycerin, propylene glycol, 1,3-butylene glycol, dipropylene glycol, and sorbitol.

Thickening agents may include polymers, such as methylcellulose, hydroxymethylcellulose, hydroxyethylcellulose, carrageenan, carboxymethylcellulose, carboxymethylhydroxyguanine, cetearyl alcohol, stearic acid, polyquaternium-7, and polyquaternium-10, and may be used in various amounts.

Examples of antiseptics may include benzoic acid, p-oxybenzoic acid esters, methylchloroisothiazolinone mixture, phenoxy ethanol, and DMDM hydantoin.

Examples of antioxidants may include ammonium thioglycolate, dibutylhydroxytoluene, and ascorbic acid.

Examples of disinfecting agents may include chlorhexidine gluconate, quarternary ammonium salts, piroctone olamine, zinc pyrithione suspension, iodopropynyl butylcarbamate, and salicylic acid.
Examples of anti-inflammatory agents may include monoammonium glycyrrhizinate, dipotassium glycyrrhizinate, stearyl glycyrrhizinate, chamomile, alpha-bisabolol, allantoin, and mixtures thereof.

Examples of antimicrobial agents may include phenoxy ethanol, chlorohexidine, chlorohexidine gluconate, piroctone olamine, ketoconazole, arnica extract, iodopropynyl butylcarbamate, benzalkonium chloride, benzethonium chloride, benzoic acid and salts thereof, benzylalcohol, lavender, rosemary, salicylic acid, triclocarban, zinc pyrithione suspension, and mixtures thereof.

Examples of solvents may include ethanol, purified water Tween 20, cyclomethicone, mineral oils, and dimethicone.

Examples of flavoring agents and pigments may include ingredients generally used in formulations for the scalp and the hair.

The hair dye composition of the present invention is preferably formulated into a cream, a liquid, a powder, a gel, and an aerosol. Also, an oxidizing agent to be mixed with the present composition for hair coloring may be in any type of the above formulation types.

The amount of the hair dye composition of the present invention to be used may be suitably determined depending on the state of the hair, the user's age, the length of the hair, and the like. The present composition is mixed with an oxidizing agent provided as a second part immediately before application to the hair. In addition to the oxidizing agent such as hydrogen peroxide, the second part includes a base, such as propylene glycol, dimethicone, polyoxyethylene cetyl ether, decyl oleate, cetearyl alcohol and glyceryl stearate SE, a hair protective agent, such as camellia oil and hydrolyzed keratin, a pH adjusting agent, a flavoring agent, and a solvent.

Upon actual application of the hair dye composition of the present invention, a hair dye formulation (first formulation) according to the present invention is mixed with an oxidizing agent such as hydrogen peroxide (second formulation) at a ratio of 1:1, and the mixture is applied to the hair in an amount ranging from about 50 ml to about 200 ml (for a single application). The reaction is allowed to occur for about 5 min to 60 min, and the hair is sufficiently rinsed with water, shampooed with a hair rinse, and rinsed again.

Mode for the Invention

A better understanding of the present invention may be obtained through the following examples which are set forth to illustrate, but are not to be construed as the limit of the present invention.

PREPARATION EXAMPLE 1: Preparation of Mori Folium water extract

Mori Folium was washed with water, dried for three days in the shade, and
pulverized to obtain Mori Folium powder. The Mori Folium powder thus obtained was placed into an earthen jar, and the jar was buried in the loess six cubits deep. The Mori Folium powder was ripened for a period of 49 days, and then extracted with water, thereby yielding a Mori Folium water extract.

Preparation Example 2: Preparation of plant fermentation extracts

Mori Folium (1 kg) was washed with water, mixed with unrefined black sugar (1 kg), allowed to ferment at room temperature for three months in the shade, and extracted with water, thereby yielding a Mori Folium fermentation extract.

According to the same method, fermentation extracts of Lonicerae Flos, Glycyrrhizae Radix, Codonopsis Radix, Rhynchosia molubilis, and Coptidis Rhizoma were prepared.

Preparation Example 3: Preparation of sulfur and loess water

Water (10 L) was added to loess (10 kg), and loess was allowed to precipitate for two days. The supernatant was recovered and used as loess water.

Sulfur (5 kg) was added to the loess water (5 L), and heated at 95°C for 2 hrs twice. The loess water was discarded, and then the filtered particles were supplemented with loess water and heated again. This heating process was carried out nine times. Upon the tenth heating, ginger juice (5 kg) was added to the sulfur-containing loess water, and this heating process was repeated nine times. Sulfur was allowed to precipitate in a powder state, and was then recovered and dried. The loess water used from the tenth heating was recovered and used for preparing the hair dye composition according to the present invention.

Examples 1 to 3

A. Preparation of a first formulation (a hair dye composition)

A hair dye composition was prepared using the Mori Folium water extract, plant fermentation extracts, sulfur and loess water, prepared in Preparation Examples 1 to 3, according to the composition described in Table 1, below.

First, compounds (7) to (14) were mixed in a container with stirring at 80°C. Then, major ingredients (1) to (6) were added to the primary mixture, and the resulting mixture was cooled to room temperature with stirring. Thereafter, the remaining ingredients were added thereto and mixed to homogeneity, thereby yielding a hair dye composition.

Table 1
B. Preparation of a second formulation (an oxidizing agent composition)

An oxidizing agent composition was prepared according to the composition described in Table 2, below, as follows.

Materials (2) to (7) and purified water were placed into a reactor, and mixed with stirring at 80°C. While the primary mixture was cooled, it was mixed with phosphoric acid (8) at 55°C, hydrogen peroxide (1) at 40°C, and glycine (10) at 35°C. The resulting
mixture was mixed to homogeneity, thereby yielding an oxidizing agent composition.

### TABLE 2

<table>
<thead>
<tr>
<th></th>
<th>Component</th>
<th>Content (wt%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Major component</td>
<td>Hydrogen peroxide (35%)</td>
</tr>
<tr>
<td>2</td>
<td>Stabilizer</td>
<td>EDTA</td>
</tr>
<tr>
<td>3</td>
<td>Base</td>
<td>Stearimonium chloride</td>
</tr>
<tr>
<td>4</td>
<td>Base</td>
<td>Glyceryl isostearate</td>
</tr>
<tr>
<td>5</td>
<td>Base</td>
<td>Mineral oils</td>
</tr>
<tr>
<td>6</td>
<td>Base</td>
<td>Cetyl alcohol</td>
</tr>
<tr>
<td>7</td>
<td>Base</td>
<td>Linolin</td>
</tr>
<tr>
<td>8</td>
<td>Stabilizer</td>
<td>Phosphoric acid</td>
</tr>
<tr>
<td>9</td>
<td>Buffering agent</td>
<td>Sodium pyrophosphate</td>
</tr>
<tr>
<td>10</td>
<td>Moisturizing agent</td>
<td>Glycine</td>
</tr>
<tr>
<td>11</td>
<td>Solvent</td>
<td>Purified water</td>
</tr>
</tbody>
</table>

### COMPARATIVE EXAMPLE 1

A hair dye composition was prepared according to the same method as in Example 1, except that the plant fermentation extracts were not used.

### COMPARATIVE EXAMPLE 2

A hair dye composition was prepared according to the same method as in Example 1, except that the sulfur was not used.

### TEST EXAMPLE 1: Hair coloring test

The hair dye compositions prepared in Examples and Comparative Examples were assessed for hair coloring properties.

The first and second formulations of Examples 1 to 3 and Comparative Examples were mixed in a ratio of 1:1, and evenly applied to black hair and white hair, which was 8 cm long and weighed 0.7 g. After 20 min, the hair was shampooed, rinsed with warm water five times, and dried with a towel and then a hair dryer. The dried hair was evaluated for dyeability and color fastness. The results are given in Table 3, below.

Dyeability was determined by measuring the color difference ($\Delta E$) between stained hair and unstained hair using a spectrophotometric colorimeter (Model Minolta CM-370Od, Japan). A larger color difference indicated that a hair dye formulation has good dyeability.

Color fastness was determined by immersing the dye-deposited hair in an acidic solution similar to sweat and monitoring color change after a predetermined period of
time.

TABLE 3

<table>
<thead>
<tr>
<th></th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
<th>Comparative Example 1</th>
<th>Comparative Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyeability</td>
<td>65</td>
<td>54</td>
<td>62</td>
<td>58</td>
<td>60</td>
</tr>
<tr>
<td>Color fastness</td>
<td>☀️</td>
<td>☀️</td>
<td>☀️</td>
<td>☀️</td>
<td>☀️</td>
</tr>
<tr>
<td>☀️: excellent, ☀️: good, ☀️: ordinary, X: bad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TEST EXAMPLE 2: Skin irritation test

The hair dye compositions prepared in Examples and Comparative Examples were assessed for allergy incidence frequency and hair damage-preventing effects.

Fifty males aging from 25 to 40 and fifty females aging from 25 to 40 were selected, and grouped. Each group consisted of twenty individuals (ten males and ten females), and was subjected to hair coloring with the hair dye formulations prepared in Examples and Comparative Examples. Individuals were examined for allergic reactions on the scalp and hair damage. The results are given in Table 4, below.

TABLE 4

<table>
<thead>
<tr>
<th></th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
<th>Comparative Example 1</th>
<th>Comparative Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects who developed allergic reactions</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Number of subjects whose hair was damaged</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>16</td>
<td>6</td>
</tr>
</tbody>
</table>

As shown in Table 4, when hair coloring was performed with the hair dye composition containing various plant fermentation extracts and sulfur according to the present invention, allergic reactions and hair damage rarely occurred. In contrast, the composition of Comparative Example 1, which did not contain any plant fermentation extracts, damaged the hair. The composition of Comparative Example 2, not containing sulfur, caused very severe allergic reactions on the scalp.

Industrial Applicability

As described hereinbefore, the present invention provides a hair dye composition, which does not develop irritation reactions on the scalp, rapidly repairs damaged hair fibers, and gives a long-lasting glossy sheen by providing elasticity and nutrients to the hair.
Claims

[1] A hair dye composition which comprises a Mori Folium water extract, a Mori Folium fermentation extract, a Mori Cortex Radicis fermentation extract, a Lonicerae Flos fermentation extract, a Glycyrrhizae Radix fermentation extract, a Codonopsis Radix fermentation extract, a Rhynchosis molubilis fermentation extract, a Coptidis Rhizoma fermentation extract, sulfur, a dye, and a base.

[2] The hair dye composition according to claim 1, which comprises the Mori Folium water extract in an amount from 0.01% to 5.0% by weight, the Mori Folium fermentation extract in an amount from 0.01% to 5.0% by weight, the Mori Cortex Radicis fermentation extract in an amount from 0.01% to 5.0% by weight, the Lonicerae Flos fermentation extract in an amount from 0.01% to 5.0% by weight, the Glycyrrhizae Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Codonopsis Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Rhynchosis molubilis fermentation extract in an amount from 0.01% to 5.0% by weight, the Coptidis Rhizoma fermentation extract in an amount from 0.01% to 5.0% by weight, the sulfur in an amount from 0.5% to 1.5% by weight, the dye in an amount from 0.001% to 5.0% by weight, the base in an amount from 10% to 40% by weight, and purified water up to 100% by weight, based on total weight of the composition.

[3] The hair dye composition according to claim 1, wherein the Mori Folium water extract is ripened at a low temperature for a period from 30 to 60 days and extracted with water weighing 5 to 10 times as much as weight of Mori Folium powder.

[4] The hair dye composition according to claim 1, wherein the Mori Folium water extract has a strong alkali pH ranging from 13 to 14.

[5] The hair dye composition according to claim 1, wherein the Mori Folium fermentation extract, the Mori Cortex Radicis fermentation extract, the Lonicerae Flos fermentation extract, the Glycyrrhizae Radix fermentation extract, the Codonopsis Radix fermentation extract, the Rhynchosis molubilis fermentation extract and the Coptidis Rhizoma fermentation extract are prepared by ripening through microbial fermentation and extraction with water.

[6] The hair dye composition according to claim 1, wherein the sulfur is purified by repeatedly performing a heating and filtering process using loess water 7 to 15 times, adding ginger juice to sulfur-containing loess water in an amount weighing 0.05 to 0.2 times weight of the loess, and performing the heating and filtering process 7 to 15 times.

[7] The hair dye composition according to claim 1, wherein the dye is one or more
selected from among p-phenylenediamine, o-phenylenediamine, resorcin, 2-methylresorcinol, m-phenylenediamine, m-aminophenol, o-aminophenol, p-aminophenol, toluenediamines, aminonitrophenols, diphenylamines, N-phenyldiamines, diaminopyridines, and salts thereof.

The hair dye composition according to claim 1, wherein the base is one or more selected from among propylene glycol, cetarylalcohol, polyoxyethylene oleyl ether, polyoxyethylene cetyl ether, stearamide MEA, oleic acid, oleyl alcohol, dimethicone, behenyl alcohol, and glyceryl stearate.

The hair dye composition according to claim 1, further comprising one or more selected from the group consisting of a hair protective agent, a chelating agent, a surfactant, a pH adjusting agent, an alkalifying agent, a moisturizing agent, a thickening agent, an antiseptic, an antioxidant, a disinfecting agent, an anti-inflammatory agent, an antimicrobial agent, a solvent, a flavoring agent, and a pigment.

The hair dye composition according to claim 1, which is formulated into a cream, a liquid, a powder, a gel, or an aerosol.

A method of preparing a hair dye composition, comprising primarily mixing a base and a dye, and mixing the primary mixture with a Mori Folium water extract, a Mori Folium fermentation extract, a Mori Cortex Radicis fermentation extract, a Lonicerae Flos fermentation extract, a Glycyrrhizae Radix fermentation extract, a Codonopsis Radix fermentation extract, a Rhynchosia molubilis fermentation extract, a Coptidis Rhizoma fermentation extract, and sulfur.

The method according to claim 11, wherein the Mori Folium water extract is used in an amount from 0.01% to 5.0% by weight, the Mori Folium fermentation extract in an amount from 0.01% to 5.0% by weight, the Mori Cortex Radicis fermentation extract in an amount from 0.01% to 5.0% by weight, the Lonicerae Flos fermentation extract in an amount from 0.01% to 5.0% by weight, the Glycyrrhiza Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Codonopsis Radix fermentation extract in an amount from 0.01% to 5.0% by weight, the Rhynchosia molubilis fermentation extract in an amount from 0.01% to 5.0% by weight, the Coptidis Rhizoma fermentation extract in an amount from 0.01% to 5.0% by weight, the sulfur in an amount from 0.5% to 1.5% by weight, the dye in an amount from 0.001% to 5.0% by weight, the base in an amount from 10% to 40% by weight, and purified water up to 100% by weight, based on total weight of the composition.
A. CLASSIFICATION OF SUBJECT MATTER
A61K 8/97(2006.01)1, A61Q 5/06(2006.01)1

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)

IPC 8 A61K 8/97, 7/075, 7/13, A61Q 5/06, 5/10

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

Korean Patents and Applications for invention since 1975

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

eKIPASS(KIPO internal)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
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Further documents are listed in the continuation of Box C

See patent family annex

* Special categories of cited documents
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"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 07 DECEMBER 2006 (07.12.2006)

Date of mailing of the international search report 07 DECEMBER 2006 (07.12.2006)

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