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Process for the oxidative dyeing of human hair

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Abstract of the Disclosure

A new two-step process for the dyeing of human hair, providing in particular enhanced color intensity and gentle treatment of the hair, comprising the steps:

Application to the hair of an alkaline oxidation dyestuff composition comprising at least one developing and at least one coupling substance as well as an oxidizing agent, and, after completed processing, without rinsing,

application of an acidic oxidation dyestuff composition comprising at least one developing and one coupling substance as well as an oxidizing agent, and

rinsing the hair after completed dyeing.



AUSTRALIA

Patents Act 1990

Goldwell GmbH

KPS-Kao Professional Salon Services GmbH



ORIGINAL

COMPLETE SPECIFICATION
STANDARD PATENT

Invention Title:

Process for the oxidative dyeing of human hair

The following statement is a full description of this invention
including the best method of performing it known to us:-

Process for the Oxidative Dyeing of Human Hair

The present invention concerns a new process for the oxidative dyeing of human hair which is not only more gentle to the hair than customary processes but which also provides improved coverage, color intensity and stability.

5 When dyeing hair, it is still customary to use oxidation hair dyestuffs mixed immediately prior to use with oxidizing agent compositions, in particular on the basis of diluted hydrogen peroxide, and then applying to the hair.

The pH-value of these ready-to-use compositions is generally in the alkaline range, in particular at pH-values between about 9 and about 11.



This alkaline treatment of the hair may damage the structure thereof, in particular in the event of frequent repetition, and especially when the hair so treated was already subjected to previous damage. After coloration, this porous hair also shows poor color fastness.



It has been already proposed to overcome these disadvantages of customary hair dyeing by replacing the alkaline dyeing compositions by an analogous composition with a pH-value within the slightly acidic area between about 5.9 and 6.9.



Such compositions as described, for example, in DE-A No. 35 30 270, 36 28 397 and 36 28 398, have indeed proven substantially less damaging to hair than alkaline products.



In some cases, however, i.e. in the preparation of special shades, the intensity and stability of the colorations achieved with these compositions is not fully satisfactory.

The invention intends to overcome these disadvantages.

20 The solution of this problem consists in the use of a new process for the oxidative dyeing of human hair, comprising the following steps:

Application to the hair of an alkaline oxidation dyestuff mixture ~~including~~ at least one developing and at least one coupling substance as well as an oxidizing agent, subsequently, preferably after about five to twenty minutes processing, without rinsing, application of an

25 acidic oxidation dyestuff mixture ~~including~~ at least one developing and one coupling substance as well as an oxidizing agent, and rinsing the hair after processing.

By use of this process, a gentle coloration of the hair is achieved providing excellent color intensity.

The time required for dyestuff processing can be reduced by about 25% to 50% through application of heat, preferably about 30° to 50 °C, for example about 40 °C.

- 5 Both, the alkaline oxidation dyestuff compositions used in the first phase of the treatment and the acidic oxidation dyestuff compositions used in the second treatment phase, each comprising at least one developing and one coupling substance as well as an oxidizing agent, are known *per se*.

10 Regarding the alkaline ready-to-use mixtures (i.e. containing the peroxide), the pH-value of which ranges between about 8 and 11, preferably 9 and 10, in particular about 9.5, reference is made, for example, to the monography of K. Schrader, "Grundlagen und Rezepturen der Kosmetika", 2nd Ed., pp. 784-804 (1989); the compositions described therein are useful within the scope of the invention, as well as additional developing and coupling substances and shading agents, known from the extensive state of the art.

15 The same applies to the ready-to-use acidic dyestuff mixtures, i.e. adjusted to a pH-value of about 2 to 6.5, in particular about 3 to 5, used for carrying out the second phase of the process according to the invention.

20 Examples of developing substances are in particular 1.4-diaminobenzene, 2.5-diaminotoluene, tetraaminopyrimidines, triaminohydroxypyrimidines, 1.2.4-triaminobenzene, 2-(2.5-diaminophenyl)ethanol, 2-(2'-hydroxyethyl amino)-5-aminotoluene and 1-amino-4-bis-(2'-hydroxyethyl)-aminobenzene, or the water-soluble salts thereof; examples for coupling substances are resorcinol, 2-methyl resorcinol, 4-chlororesorcinol, 2-amino-4-chlorophenol, 4-(N-methyl) aminophenol, 2-aminophenol, 3-aminophenol, 1-methyl-2-hydroxy-4-aminobenzene, 3-N,N-dimethyl aminophenol, 4-amino-3-methyl phenol, 5-amino-2-methyl phenol, 6-amino-3-methyl phenol, 3-amino-2-methyl amino-6-methoxypyridine, 2-amino-3-hydroxypyridine, 4-aminodiphenylamine, 4.4'-diaminodiphenylamine, 2-dimethyl amino-5-aminopyridine, 2.6-diaminopyridine, 1.3-diaminobenzene, 1-amino-3-(2'-hydroxyethyl amino)benzene, 1-amino-3-[bis(2'-hydroxyethyl amino)]benzene, α -naphthol, 1.4-diamino-2-chlorobenzene, 4.6-dichlororesorcinol, 1.3-diaminotoluene, 1-hydroxynaphthaline, 4-hydroxy-1.2-methylene dioxybenzene, 1.5-dihydroxynaphthaline, 1.7-dihydroxynaphthaline, 2.7-dihydroxynaphthaline, 4-hydroxy-1.2-methylene dioxybenzene, 2.4-diamino-3-chlorophenol,

and/or 1-methoxy-2-amino-4-(2'-hydroxyethyl amino) benzene, whereby this list is just exemplary.

Developing and coupling substances are preferably contained in a molar proportion of 1:3 to 5:1, in particular about 1:1 and about 3:1; their proportion in the hair dyeing compositions according to the invention may range from about 0.25% to about 5% by weight, depending on the desired coloration.

Useful as oxidation agents are especially diluted hydrogen peroxide solutions, emulsions or gels; possible but less customary is also the use of further peroxides such as earth alkali peroxides, urea peroxide, melamine peroxide, etc., in the respective stoichiometrical amounts.

10 The oxidation dyestuff compositions can be used as solutions, creams, pastes, gels, aerosols, etc..



15 The proportion of the amount of alkaline dyestuff composition applied in the first phase to the acidic dyestuff composition applied in the second phase preferably ranges from about 1:3 to 3:1, preferably about 1:1. The processing time for each phase preferably is about five to thirty minutes, especially about 10 to about 20 minutes, for example, about 15 minutes each. The process according to the invention is suited both for overall, i.e. first-time coloration of the hair and for freshen-up treatments.



It may be advisable to have a slightly longer processing time of the alkaline dyeing composition compared to the acidic dyeing composition.



20 Upon application of the acidic hair dyeing composition, the pH-value of the dyeing composition on the hair preferably ranges between about 5 and 8, especially about 6 and 7.5.

The following Examples illustrate the invention.

Example 1

A hair dyeing composition obtained by admixture of equal weight proportions of a 6% hydrogen peroxide solution and an oxidation dyestuff precursor of the following composition with a pH-value of 9.8 was applied onto strands of bleached human hair.

5 Carrier composition

	Cetyl stearyl alcohol	11.00 (% by wt.)
	Oleth-5	5.00
	Oleic acid	2.50
	Stearic acid monoethanolamide	2.50
10	Coco fatty acid monoethanolamide	2.50
	Sodium lauryl sulfate	1.70
	Sodium sulfite	1.00
	1.2-Propanediol	1.00
	Ascorbic acid	0.50
15	Ammonium chloride	0.50
	EDTA, tetrasodium salt	0.20
	Perfume	0.40
	Wheat protein hydrolyzate	0.20
	Silica	0.10

20 Oxidation dyestuff composition

	2.5.6-Triamino-4-hydroxypyrimidine sulfate	0.01
	2.5-Diaminotoluene sulfate	0.55
	4-Chlororesorcinol	0.17
	Resorcinol	0.05
25	3-Aminophenol	0.03

Water ad 100.00

After 15 minutes processing, without rinsing out the above composition, a dyestuff product prepared by mixing equal weight proportions of a 6 % H₂O₂ solution and an identical oxidation dyestuff precursor composition adjusted, however, to a pH-value of 5.0 with citric acid, was applied, well rinsed with water after 15 minutes processing, and dried.

A strong, intensive, expressive medium-blond coloration was obtained, which remained unchanged even after five shampoo treatments.

5 Strands treated in the same manner for 30 minutes with only the alkaline dyestuff composition by comparison showed a weaker coloration, which was clearly less intensive in color after five shampoo treatments than the coloration obtained by the process according to the invention. Furthermore, after the exclusively alkaline color treatment the hair had a clearly more rough feeling.

A 30-minute color treatment using only the acid dyestuff composition according to step 2 of the invention led to a hair color of substantially reduced intensity and stability.

10 **Example 2**

Into a carrier composition according to the composition of Example 1 the following oxidation dyestuff mixture was incorporated:

15	2.5.6-Triamino-4-hydroxypyrimidine sulfate	0.01 (% by wt.)
	2.5-Diaminotoluene sulfate	0.90
	2-Amino-4-hydroxypyridine	0.80
	1-Naphthol	0.17
	3-Aminophenol	0.10
	Resorcinol	0.03

20 This composition was mixed with a 6% H₂O₂ solution in a weight proportion of 1:1 (pH 9.5) and applied to strands of bleached human hair.

After 15 minutes processing, without rinsing, an identical mixture adjusted to a pH-value of 6.0 with tartaric acid, was applied, left to process for further 15 minutes, rinsed with water, shampooed and dried.

25 An intensive, glossy mahogany coloration was obtained, which was still stable after five shampoo treatments.

The same treatment over 30 minutes using only an identical acid color composition led to a substantially less intensive coloration; after application of an alkaline composition only, the hair showed a less intensive coloration and a rough feeling.

Example 3

Into a carrier composition according to Example 1, the following oxidation dyestuff mixture was incorporated:

2.5-Diaminotoluene sulfate	0.80 (% by wt.)
Resorcinol	0.30
2-Amino-4-hydroxypyridine	0.06
3-Aminophenol	0.03

This composition was mixed with a 6% H₂O₂ solution in a weight proportion of 1:1 (pH 9.6) and applied to strands of bleached human hair.

After 20 minutes processing, without rinsing, an identical mixture adjusted to a pH-value of 4.0 with citric acid was applied, left to process for further 10 minutes, rinsed thoroughly, and dried.

An intensive red-brown coloration was obtained, which was still stable after five shampoo treatments, giving the hair a soft, supple body.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Process for the oxidative dyeing of human hair, wherein first an alkaline oxidation dyestuff composition, including at least one developing and at least one coupling substance as well as an oxidizing agent, is applied
- 5 to the hair, and subsequently, after five to thirty minutes processing, without rinsing, an acidic oxidation dyestuff composition including at least one developing and one coupling substance as well as an oxidizing agent is applied, and the hair is rinsed after processing of the dyestuff compositions.
2. Process according to claim 1, wherein the processing time of the
- 10 dyestuff composition in the second treatment step is equal to or shorter than that of the first treatment step.
3. Process according to claims 1 or 2, wherein the dyestuff compositions are processed at 30° to 50°C.
4. Process according to any one of claims 1 to 3, wherein the alkaline
- 15 oxidation dyestuff composition has a pH-value of 8 to 11.
5. Process according to any one of claims 1 to 4, wherein the acidic oxidation dyestuff composition has a pH-value of 2 to 6.5.
6. A process for the oxidative dyeing of human hair substantially as
- 20 hereinbefore described with reference to any one of Examples 1 to 3 disregarding reference to the comparative process using only an alkaline dyestuff composition referred to in examples 1 and 2.

Dated this 26th day of May 1999

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