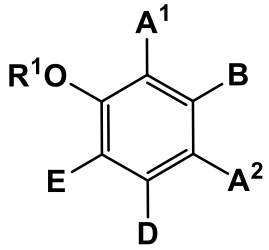
Claims

1. An agent for hair deforming treatment comprising the following components (A), (B) and (C):

(A) glyoxylic acid, or a hydrate or a salt thereof,

(B) a compound represented by the following formula (1):




(1)

wherein

$R^1$ represents a hydrogen atom or a methyl group,

$A^1$ and $A^2$, which are optionally the same or different, each represent a hydrogen atom, a straight-chain or branched-chain alkyl group or alkenyl group containing from 1 to 12 carbon atoms, an optionally substituted aralkyl group or arylalkenyl group containing from 7 to 12 carbon atoms, a straight-chain or branched-chain alkoxy group or alkenyloxy group containing from 1 to 6 carbon atoms, a halogen atom, or $-CO-R^2$ (wherein $R^2$ represents a straight-chain or branched-chain alkyl group or alkenyl group containing from 1 to 12 carbon atoms, an optionally substituted aralkyl group or arylalkenyl group containing from 7 to 12 carbon atoms, or an optionally substituted aromatic hydrocarbon group containing from 6 to 12 carbon atoms),

B represents a hydrogen atom, a straight-chain or branched-chain alkyl group or alkenyl group containing from 1 to 12 carbon atoms, an optionally substituted aralkyl group or arylalkenyl group containing from 7 to 12 carbon atoms, $-OR^3$, or $-COOR^3$ (wherein $R^3$ represents a hydrogen atom, or a straight-chain or branched-chain alkyl group or alkenyl group containing from 1 to 6 carbon atoms),

D represents a hydrogen atom, a hydroxy group, a methyl group, or a straight-chain or branched-chain alkoxy group or alkenyloxy group containing from 1 to 12 carbon atoms, and

E represents a hydrogen atom, a hydroxy group, a straight-chain or branched-chain alkyl group or alkenyl group containing from 1 to 6 carbon atoms, or a straight-chain or branched-chain alkoxy group or alkenyloxy group containing from 1 to 6 carbon atoms,

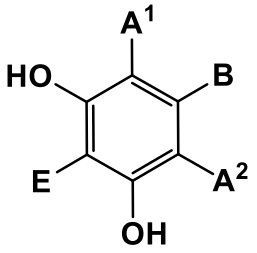
provided that two or three of $A^1$, $A^2$, B and E are hydrogen atoms, and the remaining groups do not include sulfo groups, and that when D is a hydrogen atom or a methyl group, $A^1$ and B, or $A^2$ and B, together with two carbon atoms adjacent to them, form a benzene ring optionally substituted with a hydroxy group, and

(C) water;

wherein the pH of the hair deforming treatment agent is 4 or less.

2. The hair deforming treatment agent according to claim 1, wherein the molar ratio of the content of the component (B) to the content of the component (A), (B)/(A), is 0.1 or more and 5 or less.

3. The hair deforming treatment agent according to claim 1 or 2, wherein the component (B) is a compound represented by the following formula (1-1-3):




(1-1-3)

wherein $A^1$, $A^2$, B and E are as defined above.

4. The hair deforming treatment agent according to any one of claims 1 to 3, wherein the component (B) is one or two or more selected from the group consisting of 2-alkyl resorcin, 4-alkyl resorcin, 4-aralkyl resorcin, and 4-halogenated resorcin.

5. The hair deforming treatment agent according to any one of claims 1 to 4, wherein the content of the component (A) is, in terms of glyoxylic acid, 1 mass% or more and 30 mass% or less.

6. The hair deforming treatment agent according to any one of claims 1 to 5, wherein the content of the component (B) is 0.2 mass% or more and 30 mass% or less.

7. The hair deforming treatment agent according to any one of claims 1 to 6, wherein the total amount of thiol, hydrogen sulfite and salts thereof is less than 0.1 mass%.

8. The hair deforming treatment agent according to any one of claims 1 to 7, which is a multi-part agent comprising a first agent comprising the component (B) and a second agent comprising the component (A), wherein the pH of the second agent is 4 or less.

9. A method of hair treatment for semi-permanently or permanently deforming the shape of hair, which comprises the following steps (i) and (ii):

(i) applying the hair deforming treatment agent according to any one of claims 1 to 8 to hair and then allowing the agent to penetrate into the hair, and

(ii) heating and shaping the hair into which the hair deforming treatment agent has penetrated.

10. The method of hair treatment according to claim 9, wherein the step (i) is a step of applying the first agent in the hair deforming treatment agent according to claim 8 to hair, and then applying the second agent onto the portion applied.

11. The method of hair treatment according to claim 10, which does not comprise a step of rinsing the first agent after application of the first agent to hair and before application of the second agent, wherein the molecular weight of the component (B) comprised in the first agent is from 100 to 180.

12. The method of hair treatment according to claim 10, which comprises a step of rinsing the first agent after application of the first agent to hair and before application of the second agent, wherein the molecular weight of the component (B) comprised in the first agent is from 140 to 1,000.

13. The method of hair treatment according to any one of claims 9 to 12, which comprises a step of wetting hair before the step (i).

14. The method of hair treatment according to any one of claims 9 to 13, wherein the heating temperature in the step (ii) is 50°C or higher and 250°C or lower.

15. The method of hair treatment according to any one of claims 9 to 14, wherein the step (ii) is carried out under an environment in which evaporation of water is suppressed.

16. The method of hair treatment according to any one of claims 9 to 15, which does not comprise a step of applying a hair treatment agent comprising a reducing agent or a strongly-alkaline hair treatment agent having pH of from 12 to 14 to the hair.

17. The method of hair treatment according to any one of claims 9 to 16, wherein the hair is re-deformed into a different shape by heating after the step (ii).