United States Patent [19]

Saad et al.

[11] **3,800,809**

[45] **Apr. 2, 1974**

[54] **BLEACHING COMPOSITION FOR PERMANENTLY DYED HAIR AND METHOD OF USE**

[75] Inventors: **Hosny Y. Saad,** Suffern, N.Y.; **Fred M. Tuffile,** Lakeville, Mass.; **Andrew J. Cunningham,** Highland Lakes, N.J.; **Philip Franco,** Suffern, N.Y.

[73] Assignee: **Avon Products, Inc.,** Suffern, N.Y.

[22] Filed: **Nov. 20, 1972**

[21] Appl. No.: **307,804**

[52] **U.S. Cl.** **132/7,** 8/110, 424/62

[51] **Int. Cl.** **A45d 19/00,** A61k 7/12, D06l 3/16

[58] **Field of Search** 8/110; 424/62; 132/7

[56] **References Cited**

UNITED STATES PATENTS

2,914,374 11/1959 Harris et al. 424/62

3,726,638 4/1973 Ghilardi et al. 424/62

Primary Examiner—Sam Rosen

Attorney, Agent, or Firm—Pennie & Edmonds

[57] **ABSTRACT**

A process and composition for removing dye material from keratin fibers, such as human hair, to produce fibers having the desired color shade and which will be stable to oxidation. More particularly, a process for removing dye material, such as oxidative dyes, from human hair by subjecting the fibers to compositions containing dye reducing agents, such as metal sulfoxylate-formaldehyde, urea or thioureas, in combination with a stabilizing agent of the alkali metal bisulfate class. The treated fiber has been found to inhibit the redevelopment of the undesired color.

9 Claims, No Drawings

BLEACHING COMPOSITION FOR PERMANENTLY DYED HAIR AND METHOD OF USE

BACKGROUND OF THE INVENTION

It has been observed that there are numerous applications where dyed or colored keratin fibers, such as wool, hair and the like are of a shade not desired. Heretofore, many methods have been devised to strip the dye from the fibers and then recolor the fiber with the desired colorant. One such application is in the cosmetic field of human hair coloring. The discussion below will be with reference to human hair to which this inventive concept is primarily directed.

The increase in the number of persons who color or dye their hair has resulted in increased effort to find dye removers and shade adjusters which are safe and noninjurious to the hair and the person and which are effective in obtaining and subsequently maintaining the shade desired.

Various methods have been devised for decoloring or lightening the dyes applied to the hair, but, in the majority, they present various problems. The majority of the methods used in the past involve the application of decolorizing agents consisting primarily of peroxides, such as hydrogen peroxides or strong acids or strong alkali compounds whose action has various detrimental effects to the hair and the scalp. Again, while other decolorizing agents previously used may not harm the hair, the decolorizing action is but temporary and the shade of the hair darkens merely on exposure to the air. Finally, the decolorizing compositions used heretofore have been found to leave the hair harsh and brittle due to the length of exposure necessary for the decolorizing agents to be effective.

SUMMARY OF THE INVENTION

It has now been found that permanently dyed hair can be bleached or its hair color adjusted without the detrimental effects heretofore known by applying a composition containing an alkali metal bisulfate in combination with the reducing agents of a metal sulfoxylate-formaldehyde and a urea compound. The active ingredients are applied preferably in an aqueous solution to the keratin fibers and allowed to remain thereon for a period of time sufficient to produce the desired color shade.

DETAILED DESCRIPTION OF THE INVENTION

Hair fibers, as is well known to those skilled in the art, contain polypeptide chains which are held in an alpha-helix formation by various types of bonds including covalent disulfide bonds. By the process of the present invention, it has been found possible to remove some or all of the coloring material from the hair fibers without substantially impairing the mechanical properties of these fibers and substantially inhibiting the subsequent darkening of the fibrous material by oxidation.

In accordance with the concept of this invention, the keratin hair fibers are subjected to a bleaching composition comprising a reducing agent, such as a metal sulfoxylate formaldehyde, and urea compound in combination with an alkali metal bisulfate. It has been unexpectedly found that a successful hair shade adjusting composition can be formed by incorporating an alkali metal bisulfate compound in the reducing formulation.

The incorporation of this stabilizing material essentially inhibits the undesired darkening of the hair upon exposure to air.

It is desired to point out that this invention is particularly useful for permanently dyed hair fibers. The term "permanently dyed" refers to the process wherein the particular strands which are colored are intended to permanently retain the color imparted. This is in contrast to temporary coloring of the hair as by various rinses and tints in which case it is expected the color will be removed with successive washings of the hair. It is understood, however, that where the hair is living, such as human hair, such hair cannot be permanently colored in the same sense as keratin fibers detached from the source of life. The hair, as it continually grows is repeatedly cut and more and more of the hair which was originally dyed will be lost and the original colored fibers will become present until no dyed hair remains unless further dyeing is carried out. The word "permanent" when used in connection with hair on human heads is accordingly to be understood as referring only to the hair treated.

The method of bleaching hair fibers, as herein described, may be used for removing substantially all of the dye from permanently dyed fibers or, alternatively, may be used for gradual shading or toning down of the dyed fibers. The dye may be completely removed from the hair or the dye may be incompletely removed and the fiber toned down to any desired lighter color shade without the necessity of decolorizing and redyeing of fiber. Upon completion of the treatment the hair may be rinsed or shampooed to remove the treating agents, dried, and subjected to any further treatment desired. After treatment, in accordance with the method herein described, the keratin fibers do not redevelop or reoxidize to a darker shade through air oxidation.

The hair fibers are treated with a bleaching composition which contains active ingredients in a suitable solvent to be applied to the fibrous materials. It has been found that the desired results have been unexpectedly achieved when the bleaching composition contains in combination a metal sulfoxylate-formaldehyde wherein the metal may be sodium, potassium, calcium, zinc and the like with a urea compound, such as urea, alkylthiourea wherein the alkyl group is a $C_1 - C_3$ hydrocarbon, thiourea and the like. Although these classes of compounds have been used previously as reducing agents for keratin fibers, it has now been found that the addition of an alkali metal bisulfate salt to the bleaching composition renders a bleaching composition having the desired properties discussed above and having far superior properties than heretofore known. The alkali metal bisulfate may be formed as sodium bisulfate, potassium bisulfate, calcium bisulfate and the like.

The compositions of this invention may, in general, be applied in the form of a solution, emulsion or dispersion, such as in combination with an aqueous shampoo composition. The solution, emulsion or dispersion used will be composed of an aqueous base and may contain other solvents, such as alcohols, including methanol, ethanol, propanol and the like. These other solvents may comprise of up to 50 percent of the solvent system.

The aqueous solution is readily applicable to keratin fibers and after application thereto may remain on the fibers from about 10 minutes to about 60 minutes. The length of time of application will depend on the

amount of color one desires to remove. Where exact shade adjustments are desired a small sample of the fiber may be pretreated to determine the exact length of application.

Additional ingredients may be added to the aqueous solution containing the already discussed reducing agents and alkali metal bisulfate stabilizer. These ingredients may include fillers, buffers, additional solvents, detergents, perfumes, stabilizers and the like. The use of these various additional ingredients will depend upon the specific mode of application, the specific type of keratin fiber to which it is applied, etc., as is well known to those skilled in the art.

The amount of combined reducing agents which may be utilized in the bleaching composition of this invention may range from about 3 parts to about 30 parts in a 100 parts of solution. The combined reducing agents may be composed of from about 10 percent to about 90 percent of metal sulfoxylate-formaldehyde with a corresponding 90 to 10 percent of a urea compound. The alkali metal bisulfate salt used herein in combination with the reducing agents may be of equal parts to that of the combined reducing agents. Alternatively, the bisulfate salts may range in concentration from about 1 part of bisulfate to 3 parts of combined reducing agents to about 3 parts of bisulfate salt to 1 part of combined reducing agent.

The reducing agents and bisulfate salt may be packaged as an aqueous solution or, alternatively, may be packaged in a dry form to be mixed just prior to use. It has sometimes been found necessary due to incompatibility with additional ingredients that these ingredients be kept in separate containers or that the various ingredients be kept in one multi-divided packet and mixed just prior to use. Alternatively, a stabilizing compound may be incorporated in the bleaching composition.

The following examples are set forth for the purposes of illustration only and are not to be construed as limitations on the present invention except as set forth in the appended claims. All parts and percentages are by weight unless otherwise indicated.

EXAMPLE I

A bleaching composition containing 5 parts of sodium sulfoxylate-formaldehyde, 5 parts urea and 5 parts of sodium bisulfate is mixed with an aqueous shampoo composition of:

formalin	0.025	part
hydroxyethyl cellulose (MW = 52,000)	0.75	part
n-propanol	15.00	parts
BTC 50 [benzalkonium chloride]	3.00	parts
LMDA [70:30 Lauroyl — myristoyl diethanolamide]	2.00	parts
Cocoyl betaine	3.00	parts
Citric Acid (25% solution)	2.00	parts
Butylated hydroxy anisole	1.00	parts
perfume	0.50	part

The total composition was diluted to 100 parts with water.

The aqueous shampoo solution containing the bleaching composition is applied to human hair which had been previously dyed with an oxidative dye material. The aqueous solution is allowed to remain on the hair for approximately 40 minutes after which time it is rinsed with warm water. The hair is then shampooed with a commercial detergent to remove any remaining bleaching composition. The resulting hair upon examination was found to be substantially void of the oxidative dye colorant. No reoxidative darkening or redevelopment of the dye material is subsequently observed.

EXAMPLE II

A bleaching composition similar to that of Example I is incorporated in a shampoo solution described in Example I above.

The aqueous shampoo containing the bleaching composition is applied to human hair having substantially the same dye color as that of Example I. The solution was allowed to remain on the hair for approximately 20 minutes and then rinsed with warm water. The hair was finally shampooed with a commercial detergent to remove any residue of the bleaching composition. The color of the hair is several shades lighter and no air oxidation or redeveloping of the oxidative dye is observed.

EXAMPLE III

A bleaching composition containing 5 parts zinc sulfoxylate-formaldehyde, 5 parts urea and 10 parts potassium bisulfate is added to a shampoo solution similar to that described in Example I. The solution is diluted with water to 100 parts.

The aqueous shampoo solution containing the color bleaching composition is applied to human hair which has been previously dyed with an oxidative dye material. The solution is allowed to remain on the hair for about 40 minutes. The hair is then rinsed of the shampoo solution by first rinsing with water and then with a commercial detergent. Upon inspection it was observed that the dye color of the hair was substantially removed and that no air oxidative darkening nor redevelopment of the dye color occurred.

EXAMPLE IV

A bleaching composition containing 1 part urea, 5 parts zinc sulfoxylate-formaldehyde and 5 parts sodium bisulfate is mixed with a shampoo solution similar to that described in Example I. Additional water is added to form a 100 part solution.

The aqueous shampoo solution containing the bleaching composition is applied to human hair which has been previously dyed with an oxidative dye material. The solution is allowed to remain on the hair for approximately 15 minutes. The hair is then rinsed with warm water and finally rinsed with a commercial detergent. The color of the hair is several shades lighter than that formed by the oxidative dye. No air oxidation nor redevelopment of the initial dye color is observed.

It will be understood that it is intended to cover all changes and modifications of the disclosure of the invention herein chosen for the purpose of illustration which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A bleaching preparation for removing a portion of a dye material from hair fibers which comprises (1) a reducing composition comprising for each 100 parts by weight from about 90 parts to 10 parts of at least one metal sulfoxylate-formaldehyde wherein the metal is selected from the group consisting of sodium, potassium, calcium and zinc and correspondingly about 10 parts to 90 parts of an agent selected from the group

consisting of urea, thiourea and C_1–C_3 alkylthiourea and (2) an alkali metal bisulfate in an amount of from about ⅓ to 3 parts by weight for each part by weight of said reducing composition, said reducing composition and alkali metal bisulfate being in an aqueous solvent.

2. A bleaching composition according to claim **1** wherein zinc sulfoxylate-formaldehyde and urea comprise the reducing composition and are used in combination with potassium bisulfate.

3. A bleaching composition according to claim **1** wherein sodium sulfoxylate-formaldehyde and urea comprise the reducing composition and are used in combination with sodium bisulfate.

4. A bleaching composition according to claim **1** wherein zinc sulfoxylate-formaldehyde and thiourea are used in combination with potassium bisulfate.

5. A bleaching composition according to claim **1** wherein the aqueous solvent contains up to 50 percent of a $C_1 - C_3$ alkyl alcohol.

6. A process for removing at least some of the dye material from hair fibers which comprises applying to the hair fibers a preparation which comprises (1) a reducing composition comprising for each 100 parts by weight from about 90 parts to about 10 parts of at least one metal sulfoxylate-formaldehyde and correspondingly from about 10 parts to 90 parts of an agent selected from the group consisting of urea, thiourea, and C_1–C_3 alkylthiourea and (2) an alkali metal bisulfate in an amount of from ⅓ to 3 parts by weight per part by weight of reducing agent, said reducing composition and alkali metal bisulfate being in an aqueous solvent; treating the hair fiber with said bleaching composition for approximately 10 minutes to 60 minutes to produce the desired color and removing the bleaching composition from the hair fiber.

7. A process according to claim **6** wherein the reducing composition is zinc sulfoxylate-formaldehyde and urea and is used in combination with potassium bisulfate.

8. A process according to claim **6** wherein the alkali metal bisulfate is potassium bisulfate.

9. A process according to claim **6** wherein the hair fiber is finally rinsed with water and then with a shampoo.

* * * * *