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3,402,986

**DYEING LIVE HUMAN HAIR WITH DIRECT
DYES AND ALCOHOL SOLVENTS**

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1966, Ser. No. 533,239

5 Claims. (Cl. 8—10.1)

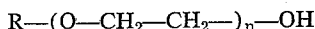
ABSTRACT OF THE DISCLOSURE

Method of dyeing hair at ambient temperature using a direct dye dispersed in an aqueous medium containing not more than 10% by weight of any water miscible alcohol selected from the group consisting of thioether alcohols, keto alcohols, saturated carbocyclic alcohols and heterocyclic alcohols that are colorless, non-toxic and chemically indifferent to the dye and hair.

This application is a continuation of our prior application Ser. No. 689,267, filed Oct. 10, 1957, and now abandoned.

This invention relates to compositions which can be used for dyeing animal fibres, particularly for dyeing live human hair and to the preparation and use of such compositions.

In copending U.S. Patent No. 2,983,651, there is described a composition for dyeing live human hair comprising a solution of a direct dye in an aqueous organic solvent which is chemically indifferent with respect to the dye and to the product to be dyed, the said solvent being completely miscible with water in the proportion in which it is present and having the general formula:



in which R represents an aliphatic hydrocarbon group having a straight or branched chain containing at most 8 carbon atoms, n is from 1 to 4. By "direct dye" is meant any dyestuff capable of being fixed directly and in the final shade by the hair to be dyed, without it being necessary to interpose any chemical transformation, such as for example an oxidation, a coupling or a mordanting of the fibre.

It has now been found that other organic solvents miscible to greater or lesser degree with water and of a constitution different from those of the general formula given in the aforesaid patent permit similar results to be obtained, i.e., permit the use of a large number of dyestuffs which normally, under temperature conditions lower than 50° C., have only a very low affinity, or even no affinity, for hair and which have so far been considered unsuitable for practical use for such an application.

The organic solvents miscible to greater or lesser degree with water, which are employed in the present invention act in the same manner as those of the aforesaid patent by considerably increasing the developments and the fixing of such dyestuffs on the hair, either at ambient temperature or under the aforesaid temperature conditions.

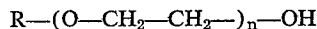
According to the present invention a composition for dyeing animal fibres and human hair comprises a solution of a direct dye in an aqueous alcohol which is chemically indifferent with respect to the dye and to the hair, the said alcohol being miscible with water in the proportion in which it is present and being selected from the class consisting of butyl alcohol, thioether alcohols, keto alcohols, aralkanols, carbocyclic alcohols and heterocyclic alcohols and mixtures thereof.

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Illustrative examples of such alcohols and preferred weight proportions in which they are used are:

- (1) butyl alcohol (up to 5%);
- (2) a thioether alcohol, e.g., thiodiglycol (up to 10%);
- (3) a ketoalcohol, e.g., diacetone alcohol (up to 10%);
- (4) an aralkanol, e.g. benzyl alcohol (up to 4%) or betaphenylethyl alcohol (up to 1%);
- (5) a carbocyclic alcohol, e.g. cyclohexanol (up to 3%);
- (6) a heterocyclic alcohol, e.g. furfuryl alcohol.

It will be understood that the proportions are only given by way of example. They can be increased or reduced according to the effect which is desired without thereby departing from the scope of the invention, provided that the limits of miscibility of the selected solvents and of the water are maintained. Moreover, in the case where two or more solvents corresponding to the aforesaid compounds are associated, the percentages given by way of indication in the case where one of the solvents is used must generally be reduced. Finally, it is possible for one of the solvents listed above or several of such solvents to have mixed therewith one or more other solvents corresponding to the aforesaid formula:



where R and n have the value set forth above, the respective proportions being modified in consequence.

Among the "direct dyes" (as hereinabove defined) suitable for use according to the present invention are: nitro, such as methylisopiramic acid and 1-hydroxy-2-amino-5-nitrobenzene, azo, anthraquinone, pigment, basic dyes complex metalliferous dyes, examples of which are given hereinafter.

Preferably the compositions of the invention contain a small proportion of an organic acid, e.g., lactic acid.

The following examples will serve to illustrate the invention: the dyes used are of the aforesaid types, having very low affinity, or even no affinity, for hair at ambient temperature under the conditions of application previously known. In all the examples, the compositions are given by weight.

Example I

The following solution is prepared:

	Percent
"Supracide Black" -----	1
Butyl alcohol -----	4
Lactic acid -----	3
Water to make -----	100

This solution is applied at ambient temperature to live hair which is naturally white and it is left in contact therewith for 15–20 minutes, whereupon the hair is rinsed with clean water. A deep grey shade is obtained with yellow tints.

Example II

The following solution is prepared:

	Percent
"Supracide Brown 4R" -----	3
Diacetone alcohol -----	10
Lactic acid -----	3
Water to make -----	100

A beige shade with slightly pink tints is obtained by operating as indicated in Example I.

Example III

The following solution is prepared:

	Percent
"Supracide Brown 4R" -----	3
Benzyl alcohol -----	3
Lactic acid -----	3
Water to make -----	100

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A deep brown shade with pink tints is obtained when operating as indicated in Example I.

Example IV

The following solution is prepared:

	Percent
"Supracide Black" -----	1
Beta-phenylethyl alcohol -----	1
Lactic acid -----	3
Water to make -----	100

A grey shade is obtained by operating at indicated in Example I.

Example V

The following solution is prepared:

	Percent
"Supracide Brown 4R" -----	3
Cyclohexanol -----	3
Lactic acid -----	3
Water to make -----	100

A beautiful beige shade with pink tints is obtained by operating as indicated in Example I.

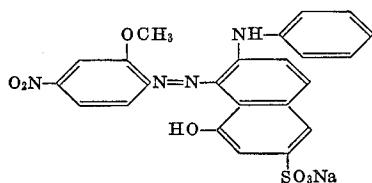
Example VI

The following solution is prepared:

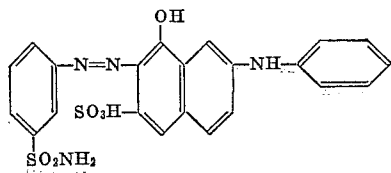
	Percent
"Supracide Black" -----	1
2-butoxyethanol -----	7
Benzyl alcohol -----	3
Lactic acid -----	3
Water to make -----	100

A very deep grey is obtained when operating as indicated in Example I.

"Supracide Black" is the following composition, as described in British Patent 758,743:



"Supracide Brown 4R" has the following structure, as described in British Patent 758,743:



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The majority of the dyes set forth above as dyes suitable for carrying the present invention into effect, are dyes which are proposed especially by the manufacturers for dyeing cellulose acetate, cotton and other cellulose fibres. It is thus all the more surprising that it is possible by using such dyes in accordance with the present invention to obtain a very satisfactory dyeing of keratinic fibres such as wool and hair, this even being possible at ambient temperature.

Furthermore, it will be understood that it is possible for two or more of these dyes to be associated in a single dye solution in identical or different proportions in order to obtain any desired shade and more particularly to match a natural shade of hair.

The dye compositions of this invention may contain conventional adjuvants, such as foaming agents, softeners and other products intended to brighten or improve in any other manner the texture or appearance of the hair.

What is claimed is:

1. A method of dyeing live human hair with a direct dye comprising applying a direct dye composition to the hair at ambient temperatures, said composition comprising a direct dye distributed in a substantially aqueous medium having an amount, not exceeding about 10% of the total weight thereof, of an alcohol which is totally miscible in water in the proportions added and is selected from the group consisting of thiodiglycol, diacetone alcohol, cyclohexanol, furfuryl alcohol and mixtures thereof.

2. The method of claim 1, wherein said alcohol is cyclohexanol.

3. A method of dyeing live human hair with direct dye stuff comprising dyeing the hair at ambient temperature with a composition comprising a direct dye distributed in a substantially aqueous medium containing an amount not exceeding about 10% of the total thereof, of diacetone alcohol.

4. A method of dyeing live human hair with a direct dye stuff comprising dyeing the hair at ambient temperature with a composition comprising a direct dye distributed in a substantially aqueous medium containing an amount, not exceeding about 10% of the total thereof, of thiodiglycol.

5. A method of dyeing live human hair with a direct dye stuff comprising dyeing the hair at ambient temperature with a composition comprising a direct dye stuff distributed in a substantially aqueous medium containing an amount, not exceeding about 10% of the total thereof, of furfuryl alcohol.

References Cited

FOREIGN PATENTS

758,743 10/1956 Great Britain.

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