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COMPOSITIONS FOR DYEING HAIR

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This invention relates to compositions for dyeing hair, such as human hair and more especially living human hair.

In dyeing hair it is customary to employ aromatic amino compounds such as para phenylene diamine and meta phenylene diamine and amino phenols. These are usually employed in conjunction with oxidizing agents such as hydrogen peroxide while ammonia is often used to accelerate the oxidation. Such dyestuffs, however, have in some cases a toxic effect especially on some persons who are particularly susceptible. Such toxic effect may arise even by contact of the skin with fur dyed with such dyestuffs.

It was suggested by M. Anore Kling (see Bulletin de L'Academie de Medecine No. 36 3rd series (1930) pp. 343–347) that the irritation which is caused by these dyeing preparations is due in a large measure at least to their alkalinity and volatility. It has been proposed, therefore, to employ as hair dyes the monosulphonic acids of aromatic amino compounds. It has also been suggested that the salicylates, lactates or benzoates of such sulphonated amines are safer to use.

One object of the present invention is to avoid the use of ammonia and to provide a composition which is less toxic than those heretofore proposed or employed. Another object is to render unnecessary the use of ammonia which is usually employed in conjunction with organic hair dyes.

It is customary in some cases to apply hair dyes in the liquid form e. g. with a brush, but if liquids are applied to the living hair, it often happens that the scalp is wetted with the dye and the liquid may run off on to the skin or garments. Sometimes, therefore, thickeners are employed so as to bring the dyeing compositions into the form of a paste. It has also been proposed to produce a compound for treating hair, containing soap, such as a neutral soap of vegetable oils, and a dye intermediate, the whole compound being adapted to produce a lather for shampooing. Such lathering, however, may cause wetting of the scalp and also tends to carry off the dye without permitting even or otherwise satisfactory results to be secured. A further object of the present invention therefore, is to produce dyeing compositions for hair which, while containing a soap is not adapted to lather. A still further object is to produce dyeing compositions for hair which are in paste form, which do not contain free ammonia, which may be applied direct to the hair and which do not possess the disadvantages hitherto encountered in hair dyes of this kind.

It has been the common practice hitherto to apply hair dyes to the hair in liquid form but, as has already been stated, one object of this invention is to provide a dye composition in paste form which may be applied direct to the hair, especially living human hair. This has many advantages including the fact that the composition may be kept ready prepared in sealed containers protected from air and light, e. g. collapsible tubes, until it is required for use. The direct application of a dye in paste form to the hair is particularly convenient because it enables the action of the dye to be localized and prevents it running on to the skin or garments. In the dyeing of white hairs the first application usually has to be made all over: further application of the dye must, however, only be made to the newly grown parts ("retouching"). For "retouching" the roots it is essential not to allow any hair-dye to go over the part of the hair previously dyed, this is called "overlapping" and the superposition of two coats of dye creates a dark streak. If the dye is applied as a liquid or as a shampoo such running and overlapping is difficult or impossible to avoid.

The following description will show more clearly how the invention may be put into practice.

The compositions of the present invention contain one or more of the known organic hair dyes together with a hydroxyalkylamine soap, the whole being preferably in paste form. The known organic hair dyes generally comprise aromatic amines such as meta phenylene diamine or para phenylene diamine or amino phenols. The compounds may be sulphonated if desired. The following may be mentioned as suitable for use:— para phenylene diamine, meta phenylene diamine, diamino phenol, dinitro phenol, para hydroxy ortho para dinitro diphenylamine, para amino phenol, sulphonated para amino phenol, sulphonated meta toluylene diamine, sulphonated dinitro phenol, sulphonated diamino benzene, sulphonated oxydinitro diphenylamine and sulphonated amino oxyphenazine. These and other organic dyestuffs for hair well known to experts in this art may be used singly or in combination with each other according to the shade or tint desired. Thus sulphonated amino oxyphenazine is particularly suitable for the production of red shades, sulphonated dinitro phenol is particularly suitable where brownish shades are required and the other sulphonated dyes mentioned are particularly suited for producing blacks. It will be understood, however, that the

shade produced will be altered by varying the concentration of the dyestuff in the composition and by shortening or lengthening the time of exposure.

The compositions preferably contain solvents for the dyestuff and/or for the hydroxyalkylamine soap which are miscible with water such as ethylene glycol monoethyl ether or alcohol e. g. ethyl alcohol or industrial spirit.

The hydroxyalkylamine soap may be a soap of ethanolamine such as the stearate or the oleate. Soaps made from mixed fatty acids are suitable. The soaps of hydroxyalkylamines will be found described in a paper by R. B. Truslер in "Oil and Fat Industries" volume 5 No. 12 December 1928 at pages 338–347.

The dyeing compositions in paste form may either be mixed, immediately before application to the hair, with a suitable proportion of an oxidizing agent preferably hydrogen peroxide (e. g. with an equal weight of hydrogen peroxide of 15 to 20 volumes strength) or more preferably the hair is first moistened with the oxidizing agent such as hydrogen peroxide. Other oxidising agents such as sodium dichromate can be used but hydrogen peroxide is preferable.

It may be mentioned that a complete range of shades from black to light blonde can be obtained by employing suitable proportions of para phenylene diamine, meta phenylene diamine and diamino phenol, separately and in suitable combinations with one another.

The following examples which are purely by way of illustration and not limiting, indicate how the improved dyeing compositions may be made up.

Example 1

The ingredients are:—

	Parts
Tri-ethanol-amine	2
Mono-ethyl ether of diethylene glycol	16
Distilled water	52
Stearic acid	30
p-phenylene diamine	3
m-phenylene diamine	0.33
Alcohol (96%)	50
Resorcine	6.65

The method of combining the above ingredients is of some importance and this is preferably accomplished as follows. The distilled water is heated to boiling point and the triethanolamine and mono-ethyl ether of di-ethylene glycol are added to it. The stearic acid is then melted and added in a thin stream to the resultant hot solution and the mixture stirred until cold, whereupon a uniform paste or soft soap is produced. This may be referred to as the soap component of the dyeing composition.

The para-phenylene diamine and meta-phenylene diamine are dissolved in the alcohol to form the dye component of the composition. The resorcine is placed in a china mortar and rubbed down with about one-quarter of the dye component, whereafter the soap component is added and intimately mixed. While still mixing the remainder of the dye component is added little by little. On completion of the addition and the mixing, the finished dyeing composition which is in the form of a paste is filled into air-tight containers and protected from sunlight.

Example 2

2 parts by weight of triethanolamine and 16 parts by weight of ethylene glycol monoethyl ether are mixed with 52 parts of distilled water and 30 parts of melted stearic acid are added to the mixture at a suitable temperature. The mixture is then stirred until a paste is formed. 3 parts of para phenylene diamine and 0.33 parts of meta phenylene diamine are then dissolved separately in 35 parts and 15 parts respectively of ethyl alcohol, the two solutions mixed and a little resorcine dissolved therein. The resulting solution is then added to the paste, carefully mixed in a mortar and sealed in collapsible tubes.

Example 3

3 parts of triethanolamine, 24 parts of ethylene glycol monoethyl ether, 45 parts of stearic acid, 88 parts of distilled water, 1 part of para phenylene diamine, 50 parts of ethyl alcohol and 1 part of diamino phenol hydrochloride are compounded into a paste as in Example 2.

In applying the above described compositions to the hair the following procedure is suitable. The hair is first thoroughly moistened with hydrogen peroxide (20 volume strength solution), a brush being used for this purpose. While the hair is still moist the paste is applied by means of a brush, parting the hair in narrow strands. It is important that the paste be used sufficiently freely to contact with the hair right down to the roots. Allow to contact with the hair for say 10 to 15 minutes and then wash off with soap (e. g. by shampooing), the scalp being vigorously rubbed and thoroughly cleansed.

Other compositions can be made up as described in the above examples. For dark brown shades 1 part of sulphonated diamino phenol with 2 parts of ortho dihydroxy benzene may be used. For golden blonde shades 0.35 part of para amino phenol with 1.75 parts of diamino phenol ($OH:NH_2:NH_2=1:2:4$) may be used. Light blonde shades may be produced by the same composition as for golden blonde shades by employing a larger proportion of hydrogen peroxide and by shortening the time of contact of the hair with the composition. Thus for golden blonde the paste may be mixed with twice its weight of 3% hydrogen peroxide and the hair treated for 30 minutes whereas for light blonde the paste may be mixed with four times its weight of hydrogen peroxide and the hair treated for 15 minutes. In the case of the dark brown composition the paste may be mixed with twice its weight of hydrogen peroxide and the hair treated for 30 minutes. It is important to note that in these cases where the composition is mixed with hydrogen peroxide before application to the hair it may be necessary to reduce the amount of water employed in making up the paste so that the composition may not lose its pasty consistency on being so mixed with hydrogen peroxide.

It will be observed that in the compositions prepared according to the present invention no ammonia is required. The hydroxylalkylamine suffices to facilitate the oxidation of the dyestuff to the required shade.

Other thickeners such as starch or mucilaginous substances may be incorporated in the pastes if desired.

I declare that what I claim is:—

1. A non-lathering hair dyeing composition in paste form comprising an intimate mixture of an organic hair dye of the class consisting of polyhydroxy and polyamino aromatic compounds, hydroxyalkylamine soap, water, a water-soluble organic solvent for said dye and fatty acid in quantity substantially exceeding the soap.

2. A non-lathering hair dyeing composition in paste form comprising an intimate mixture of an organic hair dye of the class consisting of polyhydroxy and polyamino aromatic compounds, ethanolamine soap, water, a water-soluble organic solvent for said dye and fatty acid in quantity substantially exceeding the soap.

3. A non-lathering hair dyeing composition in paste form comprising an intimate mixture of an organic hair dye of the class consisting of polyhydroxy and polyamino aromatic compounds, alcohol, ethylene glycol monoethyl ether, water, hydroxyalkylamine soap and fatty acid in quantity substantially exceeding the soap.

4. A non-lathering hair dyeing composition in paste form comprising an intimate mixture of an organic hair dye of the class consisting of polyhydroxy and polyamino aromatic compounds, a water-soluble organic solvent for said dye, water, hydroxyalkylamine and stearic acid in substantial excess of that which will combine with said hydroxyalkylamine to form a soap.

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