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DYE COMPOSITION

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This invention relates to dye compositions and particularly to stable dry powder water soluble compositions for household use in dyeing silk goods.

The particular object of this invention is to provide a dye composition which will give improved brilliancy, fastness and finish to the goods, and at the same time having all of the necessary characteristics of a practicable household dye.

While silk dyeing compositions of this class have heretofore been used wherein an acid dye is combined with an acid salt capable of hydrolyzing in water to release free acid for combination with the dye, it has heretofore been considered impracticable to use substances giving a relatively high hydrogen-ion concentration in solution, such as di-basic hydrogen-alkali metal salts of the highly ionized mineral acids. The practice heretofore has been to use as an acidifying agent dry non-hygroscopic acids such as tartaric, fumaric and maleic acids, and also non-hygroscopic salts such as sodium acid fluoride. I have now discovered that salts such as the acid sulphates or acid phosphates of sodium, potassium and ammonium when dissolved in water produce a much higher hydrogen-ion concentration than the acids and sodium acid fluoride above mentioned. An objection to the use of acid sulphates and acid phosphates which give a very high hydrogen-ion concentration is their hygroscopicity, which causes a dry powder acid dye composition to agglomerate or cake, or even to partly deliquesce, which not only interferes with the keeping qualities of the composition in a store, but affects the solubility, and causes the dyeing to be weak as well as speckled or uneven. I have found that a dye composition not subject to the foregoing objections can be produced by combining an acid dye incapable of being precipitated by free acid of a leveling or filling agent, with highly ionizable sodium, potassium or ammonium acid sulphate or acid phosphate, together with an agent which offsets the hygroscopic properties of the acid sulphate or acid phosphate. Such an agent is starch, which acts by coating the particles of hygroscopic acid salts and thus protects them from the atmospheric moisture, as well as absorbing atmospheric moisture, and thereby preventing caking of the dry dye powder composition. In connection with such composition, a leveling or filling material is generally used, such as sodium sulphate.

I have further found that a very desirable improved action of the dyeing agent is obtained to give the silk fiber more luster and a better body and finish if a water soluble colloidal material is included in the composition. Such a material is gelatin which I can add as a dry powder with the other ingredients, but which I preferably add in a novel manner in the form of a capsule which encloses the entire powder. When thrown into the hot water used for dyeing, the gelatin capsule immediately dissolves and, with its contents, gives the correct proportions to obtain the desired effect. This is an improvement over the customary method of using household dyes by measures, as ordinary household methods are inaccurate and lead to erratic results. By the use of dye compositions in capsules for household dyeing of all fabrics and textiles more reliable and better results are obtained.

Inasmuch as the finer articles of feminine apparel are the articles usually dyed by the class of dye to which this invention specifically relates, and as the operation of dyeing is in itself somewhat unattractive, I further introduce into the composition a perfuming agent to convey to the dyed garments a pleasing and refreshing odor, and in so doing take advantage of the natural property of starch for absorbing and retaining essential oils and other perfuming materials. The

starch consequently serves as a carrier for the introduction of such quantity of perfume as will impart a pleasant and agreeable odor to the product, without affecting absorption of the dye by the goods and without causing any change in the shade desired.

A suitable composition is:

	Parts by weight
Soluble acid or azo dye, such as acid violet 10B or acid violet 4BM	½ to 8
Sodium sulphate	100 to 200
Starch	5 to 75
Sodium acid sulphate	½ to 25
Gelatin	1/10 to 10
Oil of rose or other perfume	1/10 to 2

If ammonium or potassium acid sulphate or acid phosphate are used instead of sodium acid sulphate herein referred to, a somewhat greater quantity will be required.

The first four materials may be mixed dry in a suitable mixing apparatus, and the perfume thoroughly incorporated with a sufficient amount of dry starch, is then added. These ingredients are again thoroughly mixed and put into the gelatin capsules in the exact quantities which when used with the exact specified amount of water will give the exact shade desired on silk. The powdered starch, with or without perfume, may first be mixed with the hygroscopic salt, to coat same, and then the other ingredients added to this mixture. Ten to twenty grams of the above composition to one gallon of hot water (more or less according to the shade desired) immersed for three minutes, and then rinsed thoroughly, will give a fast shade and impart an improved luster, brilliancy and finish to the goods. While the perfume may be omitted, it nevertheless has a pleasing and beneficial effect, and where used has been found to be unexpectedly lasting.

While I have particularly described my invention with reference to silk dyeing, which usually employs acid or azo dyes incapable of being precipitated by the acid highly ionizable salts specified, the invention in its broader aspects is applicable to other well known dry powder water soluble dyes, such as basic dyes, and for dyeing other materials such as cotton, wool, rayon, linen, etc. Where I specify starch, I means the term to be construed broadly to cover various materials having the common properties in dry powder form of coating a hygroscopic salt, making a colloidal solution in water, and sufficiently absorbent as to absorb and hold a perfuming agent. I therefore do not restrict the scope of the invention except as required by the appended claims.

The invention claimed is:

1. A stable dry composition for silk dyeing comprising an acid dye, a hygroscopic acid salt capable of hydrolyzing in water to release free acid for combination with the dye, and an anti-hydroscopic agent coating the particles of hydroscopic acid salt.

2. A stable composition for silk dyeing comprising an acid dye, a hygroscopic acid salt capable of hydrolyzing in water to release free acid for combination with the dye, and starch coating the particles of hydroscopic acid salt.

3. A composition for silk dyeing comprising an acid dye, an acid sulphate incapable of precipitating an acid or azo dye, and starch.

4. A composition for silk dyeing comprising an acid dye, an acid phosphate incapable of precipitating an acid or azo dye, and starch.

Signed at New York in the county of New York and State of New York, this 9th day of July, A. D. 1929.

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