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PROCESS FOR IMPROVING THE DYEINGS AND PRINTS PREPARED WITH WATER-SOLUBLE DYESTUFFS

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It is known that the wet-fastnesses of dyeings and prints, which have been prepared with the help of water-soluble dyestuffs, may be increased by aftertreatment with high-molecular organic compounds, if necessary in the form of their salts. As high-molecular compounds come outstandingly in question those which contain nitrogen and which are definitely basic or are prepared by condensation of formaldehyde with compounds containing nitrogen. The latter may be capable or incapable of being hardened.

The high-molecular compounds which here come under consideration are known in great numbers from the relevant literature. For example, so-called "cationactive" substances come in question, such as are mentioned in great numbers in the U. S. patent specifications 2,004,476, 1,948,924, 2,096,534, 2,061,860, 2,077,831, 2,132,074 and 2,149,527, and British patent specification 441,767. Among these products, those are particularly valuable which contain at least one high-molecular aliphatic radical (or a radical which behaves as such, e. g. the radical of a naphthenic acid), in addition to at least one basic nitrogen atom. Particularly useful are those products which contain a straight-line chain of 10 to 18 carbon atoms, such as the radicals of lauric acid, of coco oil fatty acid, of stearic acid, of oleic acid, etc.

This aftertreatment may influence the fastness to light of the dyeings in an unfavorable manner.

It has now been found that this disadvantage may be eliminated if an aftertreatment with copper salts is combined with the aftertreatment with the aqueous solution of high-molecular basic compounds. These combined treatments can be carried out one after the other in any desired order; it is however preferable to unite them, so that the dyeings and the prints are treated at the same time with the organic and the copper compounds, for example, with baths which contain copper salts in addition to salts of high-molecular organic basic compounds: if required, the dry treatment at raised temperatures may also hereupon take place.

As suitable copper salts, copper sulphate, copper nitrate, copper chloride, copper acetate, etc., may be mentioned.

The treatment according to the present invention results in an improvement of wet-fastness and/or light fastness, the latter being in any case of a magnitude at least equal to that of the original dyeing.

Example 1

Cotton sateen is dyed with 3% Direct Fast Scarlet 8BS (Schultz Farbstofftabellen, vol 1, No. 584, 1931) with an addition of 30% sodium sulphate crystals, calculated on the weight of the material. Dyeing is carried out for ¾ hour at 90° C. in a liquor-to-cloth ratio of 30:1. The material is hereupon rinsed with water and is subjected to aftertreatment in the following bath: 1% of 4-stearoylamino-benzol-1-trimethylammonium-methyl-sulphate as well as 2% of copper sulphate crystals, calculated on the weight of cotton material. Treatment is carried out for ½ hour at 30° C. in a liquor-to-cloth ratio of 25:1, after which the material is squeezed and dried. The fastness to light is improved in comparison with that of a dyeing aftertreated with 4-stearoylamino-benzol-1-trimethylammonium-methyl-sulphate alone.

Example 2

Cotton yarn is dyed with 3% Direct Brown M (Schultz Farbstofftabellen 1931, vol 1, No. 412) with addition of 30% sodium sulphate crystals, calculated on the weight of yarn. Dyeing is carried out 1 hour at 95° C. in a liquor-to-material ratio of 20:1. Hereupon the yarn is rinsed with water and is entered into a second bath, which contains 0.5% μ-heptadecyl-N:N-dimethylbenzimidazolium chloride, as well as 2% copper sulphate, calculated on the weight of the yarn. The yarn is worked for 20 minutes at 35° C. and is hereupon hydro-extracted. The fastness to light of this dyeing is equal to that of an untreated dyeing, whilst the fastness to water is appreciably better.

4 - stearoylamino-benzol-1-trimenthylammonium-methyl-sulphate and μ-heptadecyl-N:N-dimethylbenzimidazolium chloride may be replaced by other cationactive substances (mentioned in the second paragraph of the present patent specification). Further, for the present process, the following dyestuffs, among others, are suitable:

Cotton Yellow CH	(Schultz Farbstofftabellen 1931, vol. 1, No. 726)
Cupranil Brown R	id., 1931, vol. 1, No. 682)
Direct Fast Scarlet B	id., 1931, vol. 1, No. 584)
Direct Violet 2B	id., 1931, vol. 1, No. 502)
Direct Blue GW	id., 1932, vol. 2, page 86)
Direct Sky Blue GS	id., 1931, vol. 1, No. 510)
Direct Copper Blue BR	id., 1932, vol. 2, page 88)
Direct Fast Black B	id., 1932, vol. 2, page 88)
Chlorantine Fast Brown BRLL	id., 1932, vol. 2, page 48)
Chlorantine Fast Grey BLL	id., 1932, vol. 2, page 48)
Chlorantine Fast Black L	id., 1932, vol. 2, page 49)

What we claim is:

1. The improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one basic nitrogen atom and at least one high molecular radical selected from the high molecular radicals of the aliphatic and the cycloaliphatic series, without substantial alteration in the shade of said dyeings and prints, consisting in combining the aftertreatment with a treatment with a solution of a copper compound, whereby the wet-fastness of the dyeings and prints is enhanced and the light fastness is of a magnitude at least equal to that of the original dyeing.

2. The improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one basic nitrogen atom and at least one high molecular radical selected from the high molecular radicals of the aliphatic and the cycloaliphatic series, without substantial alteration in the shade of said dyeings and prints, consisting in combining the aftertreatment with a simultaneous treatment with a solution of a copper compound, whereby the wet-fastness of the dyeings and prints is enhanced and the light fastness is of a magnitude at least equal to that of the original dyeing.

3. The improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one basic nitrogen atom and at least one aliphatic radical which consists of a straight chain of 10 to 18 carbon atoms, without substantial alteration in the shade of said dyeings and prints, consisting in combining the aftertreatment with a treatment with a solution of a copper compound, whereby the wet-fastness of the dyeings and prints is enhanced and the light fastness is of a magnitude at least equal to that of the original dyeing.

4. The improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one basic nitrogen atom and at least one aliphatic radical which consists of a straight chain of 10 to 18 carbon atoms, without substantial alteration in the shade of said dyeings and prints, consisting in combining the aftertreatment with a simultaneous treatment with a solution of a copper compound, whereby the wet-fastness of the dyeings and prints is enhanced and the light fastness is of a magnitude at least equal to that of the original dyeing.

5. A textile colored with a water-soluble dyestuff and aftertreated simultaneously with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one basic nitrogen atom and at least one high molecular radical selected from the high molecular radicals of the aliphatic and cycloaliphatic series and with a solution of a copper compound, the wet-fastness of the aftertreated textile being superior and the light fastness thereof being of a magnitude at least equal to that of the untreated colored textile.

6. A textile colored with a water-soluble dyestuff and aftertreated simultaneously with an aqueous solution of 4-stearoylamino-benzol-1-trimethylammonium-methyl-sulfate and with a solution of a copper compound, the wet-fastness of the aftertreated textile being superior and the light fastness thereof being of a magnitude at least equal to that of the untreated colored textile.

7. A textile colored with a water-soluble dyestuff and aftertreated simultaneously with an aqueous solution of μ-heptadecyl-N:N-dimethyl-benzimidazolium chloride and with a solution of a copper compound, the wet-fastness of the aftertreated textile being superior and the light fastness thereof being of a magnitude at least equal to that of the untreated colored textile.

8. A textile colored with a water-soluble dyestuff and after treated simultaneously with an aqueous solution of a cation-active high molecular basic organic compound which contains at least one quaternary basic nitrogen atom and at least one straight-line chain of ten to eighteen carbon atoms and with a solution of a copper compound, the wet-fastness of the aftertreated textile being superior and the light fastness thereof being of a magnitude at least equal to that of the untreated colored textile.

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