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TREATMENT OF CELLULOSIC TEXTILE MATERIALS

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This invention relates to the treatment of cellulosic textile materials and in particular to improving the affinity of such materials for dyestuffs.

I have found that the affinity of cellulosic material for such classes of dyestuffs as acid wool, direct cotton, chrome, sulphur and vat (including solubilised vat dyestuffs by which I mean sulphuric ester salts of the leuco vat dyestuffs), aqueous dispersions of insoluble amino- and hydroxy-azo compounds, and of insoluble amino- and acyl-aminoanthraquinones, is improved if the material is treated prior to dyeing with a solution containing formaldehyde and a guanidine salt of a long chain aliphatic dicarboxylic acid containing at least 6 carbon atoms in the chain, either as such or in the form of their water-soluble condensation product and the guanidine salt and formaldehyde or the soluble condensation product then converted into the insoluble condensation product for instance by heating.

When the formaldehyde and the guanidine salt of the long chain aliphatic dicarboxylic acid are brought into contact in solution, they tend to combine with one another to form a water-soluble condensation product and it is difficult to say to what extent this combination has proceeded by the time it is desired to use the solution for impregnating the cellulosic material. It will, therefore, be seen that for the purposes of this invention it is equivalent whether I use the two compounds for the purposes of this invention in the uncombined state, or in the partly combined state, or the state in which they are fully combined in the water-soluble condensation product.

Examples of guanidine dicarboxylates which can be used according to this invention are guanidine adipate and guanidine sebacate.

The advantages obtained according to the process of the present invention include the following:

Cellulosic material when treated according to the present invention gives dyeings which with direct cotton dyestuffs are of improved wash-fastness, while the fastness to light is as good as similar dyeings obtained on untreated fabric.

Direct cotton dyestuffs can be dyed on the material so treated without the addition of salt to the dyebath.

The treatment, in addition to improving the affinity of the cellulosic material for the dyestuffs hereinbefore mentioned, also imparts an improved, resilient, soft, silky handle, and this improved handle persists after dyeing.

The following examples will serve to illustrate how this invention may be carried out in practice, which however is not restricted to these examples. The percentage of dyestuffs and of other additions to the dyebath is based on the weight of fabric being dyed.

Example 1

30 grams of guanidine adipate are dissolved in 160 cubic centimetres of 40 per cent formaldehyde and this solution diluted with distilled water to one litre, the pH of the resulting solution being 6.4. A length of an all-viscose satin fabric is immersed in this solution and after saturation removed, squeezed evenly so that the fabric retains from 90 to 110 per cent of its own weight of impregnating solution, dried at below 100° centigrade on a pin stenter frame, so that the fabric retains its original dimensions and finally heated at 140° centigrade for 15 minutes.

The so-treated fabric gives full shades with the following acid wool dyestuffs:

Erio Fast Cyanine S (Geigy). This dyestuff is not referred to in the Colour Index but is mentioned on page 33 of a booklet entitled "Dyestuffs for Wool" third edition, 1931, and published by J. R. Geigy Soc. Anon., Basel, Switzerland.

Solway Ultra Blue BS (Imperial Chemical Industries). This dyestuff is not referred to in the Colour Index but is mentioned in Imperial Chemical Industries Ltd. Patter Card Ref. No. 43/22/132 entitled "Dyeings on Silk" under "Acid colours."

Coomassie Violet RS (Colour Index 698).

In each case dyeing is carried out in distilled water, with a liquor to fabric volume of 40 to 1, for three-quarters of an hour at 95° centigrade with 1 per cent of dyestuff and 2 per cent of formic acid. The light fastness of these dyeings is as good as that of similar dyeings obtained on wool. The untreated fabric has a poor affinity for these dyestuffs.

Example 2

A length of all-viscose satin fabric is treated as described in Example 1 and then dyed a full shade of red with 1 per cent Diphenyl Fast Red 7BL (Colour Index No. 278) by simply heating at 90° centigrade for half an hour without salt in the bath, using a liquor to fabric ratio of 40 to 1. At the end of this period the dyebath is completely exhausted.

The dyeing on the treated fabric has a much improved wash-fastness while the light-fastness

is as good as that possessed by a similar dyeing on untreated fabric.

Example 3

30 grams of guanidine sebacate are dissolved in 160 cubic centimetres of 40 per cent formaldehyde and this solution diluted with distilled water to one litre and the pH of the resulting solution adjusted to 8.0. An all-viscose satin fabric is treated in this solution in a manner similar to that described in Example 1. The fabric is then dyed with 1 per cent Chlorantine Fast Blue 3GLL (Society of Chemical Industry in Basle), without the addition of salt, for half an hour at 90° centigrade and a deep blue shade obtained. A liquor to fabric ratio of 40 to 1 is employed. The dyestuff Chlorantine Fast Blue 3 GLL is not referred to in the Colour Index but is referred to in the Journal of the Society of Dyers & Colourists, 1938, page 273. This dyestuff is also referred to in the Society of Chemical Industry in Basle, Patter Card Ref. No. 1511 "Chlorantine Fast Colours on Viscose," on page 23.

Example 4

A length of an all-viscose satin fabric is treated in exactly the same manner as described in Example 3. The so-treated fabric is dyed in distilled water (liquor to fabric volume was 40 to 1) using:

	Per cent
Eriochrome Azurol B (Geigy) (color index No. 720)-----	2
Potassium chromate-----	2
Ammonium sulphate-----	4

added before dyeing commences.

The dyeing is started at 60° centigrade, the

temperature raised to 95° centigrade and dyeing continued at this temperature for 1¼ hours. A deep shade of blue is obtained.

What I claim is:

1. The process of improving the dyeing affinity of cellulosic material by treating such material prior to dyeing with a solution containing formaldehyde and a guanidine salt of a long chain aliphatic dicarboxylic acid containing at least 6 carbon atoms in the chain and then heating the material to convert the formaldehyde and the guanidine salt into an insoluble condensation product.

2. The process of improving the dyeing affinity of cellulosic material by treating such material prior to dyeing with a solution containing formaldehyde and a guanidine salt of a long chain aliphatic dicarboxylic acid containing at least 6 carbon atoms in the chain, in the form of their water-soluble condensation product, and then heating the material to convert the water-soluble condensation product into an insoluble condensation product.

3. The process of improving the dyeing affinity of cellulosic material by treating such material prior to dyeing with a solution containing formaldehyde and guanidine adipate, and then heating the material to convert the formaldehyde and guanidine salt into an insoluble condensation product.

4. The process of improving the dyeing affinity of cellulosic material by treating such material prior to dyeing with a solution containing formaldehyde and guanidine sebacate, and then heating the material to convert the formaldehyde and guanidine salt into an insoluble condensation product.

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