

ELECTROLYTE RESISTANT DYESTUFF CARRIER COMPOSITIONS

The invention relates to an electrolyte-resistant carrier composition which is particularly suitable for dyeing mixed polyester/cotton goods.

According to the invention there is provided an electrolyte-resistant carrier composition comprising

- a) 65 to 70 parts by weight of an alkyl (C_{1-4})naphthalene;
- b) 15 to 20 parts by weight of the condensation product of castor oil with 30 to 50 mols ethylene oxide;
- c) 5 to 6.5 parts by weight of the condensation product of a fatty C_{14-24} acid with 5 to 15 mols ethylene oxide;
- d) 6 to 7 parts by weight of the condensation product of a fatty saturated or unsaturated C_{14-24} alcohol with 5 to 15 mols ethylene oxide, the condensation product being at least partially carboxymethylated;
- e) 5 to 6 parts by weight of sulphonated castor oil, and
- f) 1.5 to 2 parts by weight of an alkyl(C_{4-20})arylsulphonic acid.

Component (a) is preferably a monomethylnaphthalene, especially a mixture of 1- and 2-methylnaphthalene such as is commercially available.

Component (b) preferably contains from 30 to 35 ethylene

oxide units.

The fatty acids in component (c) preferably contain from 15 to 22 carbon atoms, with oleic acid being most preferred. Component (c) preferably contains from 10 to 15 ethylene oxide units.

The fatty alcohols in component (d) preferably contain from 15 to 22 carbon atoms, with oleyl alcohol being most preferred. Component (d) preferably contains from 10 to 15 ethylene oxide units and is preferably fully carboxymethylated.

Suitable components (f) include alkyl C_{4-20} benzene sulphonic acids and alkyl C_{4-20} naphthalene sulphonic acids. Component (f) is preferably an alkyl C_{8-15} benzene sulphonic acid, with dodecylbenzene sulphonic acid being most preferred.

The composition of the invention may be prepared according to known methods. Preferably the components (a) to (f) are added in the indicated order. The addition of the various ingredients is carried out with stirring and the resulting mixture is stirred until it is homogeneous.

Preferably the composition is neutralized with an organic base, preferably an alkanolamine such as monoethanolamine, to the extent that it has a pH-value from 6 to 7, preferably 6.5 to 7, when it is diluted to 10 % in water.

Preferably the composition is prepared and stored in a water-free form. This can be achieved by mixing the components in anhydrous form and/or in order to remove the traces of water by adding to the neutralized composition a drying agent, e.g. dextrin.

The compositions according to the invention possess levelling activity in addition to their good carrier activity. Further the compositions have a notable resistance to electro-

lytes and are therefore particularly suitable as carrier for dyeing mixed polyester/cotton goods, especially according to the one-bath two-step process.

The present invention further provides a process for dyeing or printing textile substrates comprising synthetic or semi-synthetic hydrophobic, high molecular weight organic material with disperse dyes comprising employing a carrier composition as defined above. Suitable textile substrates include cellulose triacetate and especially linear, aromatic polyesters optionally in blends with other natural or synthetic fibres, particularly cotton.

Dyeing and printing are effected in accordance with known methods. Preferably the dyeing is carried out under normal pressure at a temperature from 90 to 108°C. The carrier composition is employed in amounts of from 2 to 15 % by weight based on the substrate.

According to a preferred embodiment of the invention mixed polyester/cotton goods are dyed in a single bath in the presence of a carrier composition as defined above, with a mixture of reactive and disperse dyestuffs.

More preferably the carrier composition of the invention is used for dyeing mixed polyester/cotton goods in a one-bath two-step process in accordance with known methods. Preferably the dyeing of the cotton fibres is effected in the first step. After addition of the reactive and disperse dyestuffs and the usual additives for dyeing cotton, e.g. common salt and alkaline agents, the dyebath is heated to 50-80°C and held at such a temperature until the reactive dyestuff is substantially fixed. The dyebath is then adjusted to pH 4.5 to 6, and after addition of the carrier composition, the dyebath is heated to 90 to 108°C, preferably 94 to 104°C, until the disperse dyestuff is substantially fixed. It may also be advantageous to add the

disperse dyestuffs not at the beginning of the reactive dyeing but after the acidification of the dyebath.

After the reactive dyeing the pH of the dyebath may be adjusted by addition of a mineral acid, for example sulphuric acid, but preferably an organic acid, particularly formic or acetic acid, is used.

After dyeing or printing, the textile substrate is rinsed, soaped or subjected to a reductive clearing, and then dried.

Preferred reactive dyestuffs are those having a fluoro-chloropyrimidine, monofluorotriazine, dichlorotriazine, dichloroquinoxaline or methylsulphochloromethylpyrimidine reactive group.

The following Examples in which all parts are by weight and all temperatures are in degrees Centigrade illustrate the invention.

EXAMPLE 1

A mixed polyester/cotton fabric (65/35) is introduced at 30° in a dyebath containing per 1000 parts water:

- 3 % C.I. Disperse Red 73
- 2.7% C.I. Reactive Red 159
- 0.3 % C.I. Reactive Orange 64
- 2 parts of a commercially available washing agent based on sodium dinaphthylmethane disulphonate and sodium tripolyphosphate
- 1.5 parts of a commercially available alkaline composition containing a mixture of silicate, borax and sodium hydroxide, and
- 60 parts sodium chloride.

The dyebath is stirred for 20 minutes at 30° then heated

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over 20 minutes to 55° and held at 55° for 30 minutes. After the pH of the dyebath has been adjusted to pH6 with acetic acid, there is added to the dyebath at 60° 4 parts of a carrier composition consisting of 65 parts commercially available methyl-naphthalene

- 15 parts condensate of castor oil with 32 mols ethylene oxide
- 5 parts condensate of oleic acid with 12 mols ethylene oxide
- 7 parts partially carboxymethylated condensate of oleyl alcohol with 12 mols ethylene oxide,
- 6 parts sulphonated castor oil,
- 2 parts dodecyl benzene sulphonic acid, and
- 1 part dextrin

the composition being neutralized to pH6.5 to 7 (when diluted to 10 % in water) with monoethanolamine before the addition of dextrin.

The temperature of the dyebath is raised to 95° over 30 minutes and dyeing is carried out at 95° for 60 minutes. After rinsing and reductive clearing, an even ruby dyeing is obtained.

EXAMPLE 2

A mixed polyester/cotton fabric (65/35) is introduced at 30° in a dyebath containing the same additives as in Example 1, but with the following dyestuffs replacing those of Example 1:

- 1.92 % C.I. Reactive Yellow 125
- 0.75 % C.I. Disperse Yellow 64
- 0.33 % C.I. Disperse Orange 31

By following the same procedure as indicated in Example 1, and using the same carrier composition, there is obtained an even dyeing.

EXAMPLE 3

A polyester fabric is introduced at 30° in a dyebath containing, per 1000 parts water:

- 3 % C.I. Disperse Red 73
- 2 parts of a commercially available washing agent as indicated in Example 1, and
- 4 parts of the carrier composition of Example 1

and adjusted to pH 5.5 with acetic acid. The temperature of the dyebath is raised to 95° over 50 minutes and dyeing is carried out at 95° for 60 minutes. After rinsing and reductive clearing, an evenly ruby dyed fabric is obtained with a good dyeing yield.

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CLAIMS

1. A composition comprising
 - a) 65 to 70 parts by weight of an alkyl (C_{1-4})naphthalene;
 - b) 15 to 20 parts by weight of the condensation product of castor oil with 30 to 50 mols ethylene oxide;
 - c) 5 to 6.5 parts by weight of the condensation product of a fatty C_{14-24} acid with 5 to 15 mols ethylene oxide;
 - d) 6 to 7 parts by weight of the condensation product of a fatty saturated or unsaturated C_{14-24} alcohol with 5 to 15 mols ethylene oxide, the condensation product being at least partially carboxymethylated;
 - e) 5 to 6 parts by weight of sulphonated castor oil, and
 - f) 1.5 to 2 parts by weight of an alkyl(C_{4-20})arylsulphonic acid.
2. A composition according to Claim 1, in which component (a) is a mixture of 1- and 2-methylnaphthalene.
3. A composition according to Claim 1 or Claim 2, in which component (b) contains from 30 to 35 ethylene oxide units.
4. A composition according to any one of the preceding claims, in which the fatty acid of component (c) contains from 15 to 22 carbon atoms.
5. A composition according to Claim 4, in which the fatty acid is oleic acid.
6. A composition according to Claims 4 or 5, in which component (c) contains from 10 to 15 ethylene oxide units.
7. A composition according to any one of the preceding claims, in which the fatty alcohol of component (d) contains



from 15 to 22 carbon atoms.

8. A composition according to Claim 7, in which the fatty alcohol is oleyl alcohol.

9. A composition according to Claim 7 or Claim 8, in which component (d) contains from 15 to 22 carbon atoms.

10. A composition according to any one of the preceding claims, in which component (f) is an alkyl_{C₈₋₁₅}benzene sulphonic acid.

11. A composition according to Claim 10, in which component (f) is dodecylbenzene sulphonic acid.

12. A composition substantially as hereinbefore described with reference to any one of Examples 1 to 3.

13. A process for dyeing or printing textile substrates comprising synthetic or semi-synthetic hydrophobic, high-molecular weight organic material with a disperse dyestuff, comprising employing a composition as defined in any one of Claims 1 to 12.

14. A process according to Claim 13, in which the substrate consists of or comprises a linear, aromatic polyester.

15. A process according to Claim 14, in which the substrate is a blend of polyester and cotton.

16. A process for dyeing or printing textiles comprising polyester substantially as hereinbefore defined with reference to any one of Examples 1 to 3.

17. Dyed or printed substrates whenever obtained by a process according to any one of Claims 13 to 16.