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(54) **PROCESS FOR TREATMENT OF A FABRIC**

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PROCÉDÉ DE TRAITEMENT D'UN TISSU

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Description**Technical Field**

5 **[0001]** The present invention relates to a process for treatment of a fabric. The invention will be described hereinafter with reference to this application. However, it will be appreciated that the invention is not limited to this particular field of use.

Background and Prior Art

10 **[0002]** Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of the common general knowledge in the field.

15 **[0003]** US2006046950A (Penninger and Bastigkeit, 2006) teaches a detergent composition for cleaning textile materials comprising a combination of a soil release-capable alkyl or hydroxyalkyl cellulose derivative and a hygroscopic polymer selected from the class consisting of polypeptides, hydrogels, polyvinyl alcohol, the polyalkylene glycols, the homopolymers of acrylic acid, methacrylic acid, and maleic acid, copolymers of acrylic acid, methacrylic acid, and maleic acid and mixtures of the homo and copolymers. The use of the hygroscopic polymers in combination with the cellulose derivatives is said to result in improved cleaning performance.

20 **[0004]** EP025696 (Unilever, 1988) teaches that improvement in soil suspension is achieved by adding mixture of vinyl pyrrolidone polymer and a nonionic cellulose ether to a detergent composition.

25 **[0005]** GB994353 (Domestos, 1965) teaches that mixtures of certain polymeric materials, when incorporated into unbuild detergent compositions based on synthetic surface active agents, provide enhanced anti-redeposition as compared to activity of individual polymers alone when added alone to same detergent compositions.

30 **[0006]** US3771951 (Berni et al, 1973) and GB133803 (Gaf Corp, 1973) teach that detergent composition comprising a water soluble detergent and a mixture of water soluble polyvinyl alcohol and a water soluble poly vinyl pyrrolidone exhibits enhanced degree of soil suspension

35 **[0007]** The above methods are reported to provide improved antiredeposition of soils and better cleaning of fabrics. However, reduction in subsequent post-wash soiling of fabrics is not reported. Further, the cleaning compositions essentially comprise of a surfactant and the pH of wash liquor is alkaline or neutral.

40 **[0008]** US4007305 (Kakar et al, 1977) addresses the problem of providing satisfactory nondurable finishes to textiles which impart optimum soil release and soil repellent properties. According to D5, the textiles must be treated with an alkaline aqueous medium having pH value of 7.5-11 and containing water soluble hydrophilic soil release polymer having carboxylic acid groups and a dispersed hydrophobic soil repellent fluorochemical.

45 **[0009]** On the other hand, various industrial treatments for fabric modification are known to render the fabric less prone to soiling. The fabric modification of this type is normally carried out during textile manufacture. The treatments, besides being substrate-specific, are relatively difficult to practise in household.

50 **[0010]** In view of the shortcomings of the prior art, one of the objects of the present invention is to provide a process for reducing soiling of fabrics that can be easily used in the household.

55 **[0011]** Another object of the present invention is to provide a process of treatment of a fabric for reducing soiling of fabrics.

60 **[0012]** Yet another object of the present invention is to provide a process for treatment of a fabric that improves efficacy of subsequent cleaning.

65 **[0013]** Yet another object of the present invention is to provide a process for reducing soiling of fabrics that allows enhanced deposition of benefit agents, such as perfume and fluorescer.

70 **[0014]** Yet another object of the present invention is to provide a process for treatment of a fabric which is effective on various types of fabrics such as cotton, polyester and polycotton.

75 **[0015]** Yet another object of the present invention is to provide a process for treatment of a fabric which is relatively easy to practice in household.

80 **[0016]** The present inventors have surprisingly found that contacting a fabric in an aqueous medium having acidic pH with two different polymers, one comprising a plurality of hydroxyl groups and the other comprising a plurality of carbonyl or ether groups, increases deposition of polymer and provides benefits such as reduction in soiling, ease of subsequent cleaning and enhanced deposition of benefit agents.

Summary of the invention

85 **[0017]** According to a first aspect of the present invention there is provided a process for treatment of a fabric comprising the steps of contacting the fabric with polymers A and B in an aqueous medium, wherein;

(a) polymer A is selected from the class consisting of homopolymers or copolymers of vinyl alcohol, alkylene glycol,

saccharides, and carboxylic acid, and;

(b) polymer B is selected from the class consisting of homopolymers or copolymers of vinyl pyrrolidone, alkylene oxide, saccharides and carboxylic acid, and;

(c) an electrolyte selected from chlorides, sulphates or nitrates of sodium, potassium, magnesium or calcium; and

where polymers A and B are not of the same class and the aqueous medium has pH less than 6.

Detailed description of the invention

Fabric

[0018] The fabric that can be treated includes synthetic as well as natural textiles. Fabrics may be made of cotton, polycotton, polyester, silk or nylon. It is envisaged that the method of the present invention can be used to treat garments and other clothing and apparel materials that form typical washload in household laundry. The household materials that can be treated according to the process of the present invention include, but are not limited to, bedspreads, blankets, carpets, curtains and upholstery. Although the process of the present invention is described primarily for treatment of a fabric, it is envisaged that the process of the present invention can be advantageously used to treat other materials such as jute, leather, denim and canvass. It is envisaged that the process of the present invention can be used to treat articles such as shoes, rain-wear and jackets.

Polymer A

[0019] According to the present invention, polymer A has a plurality of hydroxyl or carboxyl groups. The polymer A has a molecular mass preferably from 300 to 10^9 . The polymer A is selected from the class consisting of homopolymers or copolymers of vinyl alcohol, alkylene glycol, saccharides, and carboxylic acid.

[0020] Some non-limiting examples of polymer A according to the present invention include:

(a) Homopolymer of vinyl alcohol or polyvinyl alcohol.

(b) Homopolymer of ethylene or propylene glycol, i.e. polyethylene glycol and polypropylene glycol.

(c) Homopolymer of a carboxylic acid, i.e. polycarboxylic acid such as polyacrylic acid, polymaleic acid or copolymer of acrylic and maleic acid.

(d) Polysaccharides such as starch, cellulose, sodium alginate, natural gums, and their modified materials such as sodium carboxymethyl cellulose, hydroxyethyl cellulose.

[0021] Homopolymer or copolymer of vinyl alcohol has a molecular mass of preferably from 10,000 to 1,000,000, more preferably from 50,000 to 500,000 and most preferably from 50,000 to 200,000. Commercially available polyvinyl alcohols that can be used include GOHSENOL® (Nippon Synthetic Chemical Industry), MOWIOL® (Clariant) and POVAL® (Kuraray).

[0022] Homopolymer or copolymer of alkylene glycol has a molecular mass of preferably from 4,000 to 20,000, more preferably from 5,000 to 15,000 and most preferably from 5,000 to 10,000. Commercially available polyalkylene glycol can be used. Some examples of commercially available polyalkylene glycol include POLYGLYKOL® (Clariant) and CARBOWAX® (Union Carbide).

[0023] Homopolymer or copolymer of carboxylic acid has a molecular mass of preferably from 2,000 to 10,000,000, more preferably from 50,000 to 1,000,000 and most preferably from 90,000 to 500,000.

[0024] Homopolymer or copolymer of saccharide has a molecular mass of preferably from 1000 to 10^9 , more preferably from 10000 to 10^3 and most preferably from 100,000 to 10^9 .

[0025] Polymer A may be synthetic or natural. However, synthetic polymer is preferred over natural polymer.

[0026] According to a preferred aspect, the polymer A is water soluble.

[0027] It is preferred that the polymer A is selected from a class consisting of homopolymers or copolymers of vinyl alcohol or carboxylic acid.

[0028] The homopolymer or copolymer of carboxylic acid is preferably a polyacrylic acid or a copolymer thereof. Examples include SOKALAN® PA (BASF) and CARBOPOL® (Lubrizol).

[0029] The amount of polymer A is preferably from 0.005 to 2, more preferably from 0.02 to 1, and most preferably from 0.05 to 0.5 mg per cm² area of the fabric. The term "fabric area" as used herein refers to surface area of one side of the fabric.

Polymer B

[0030] According to the present invention, polymer B has a monomeric unit comprising ether or carbonyl group. Polymer B has a molecular mass preferably from 1000 to 10^9 . The polymer B is selected from the class consisting of

[0031] Polymers and homopolymers of carboxylic acid and/or saccharides and/or polyalkylene glycol/ether qualify to be selected both as polymer A or polymer B, as they comprise hydroxyl or carboxyl group and either a carbonyl or an ether group. However, according to an essential aspect, polymer A and polymer B are not of the same class. It is particularly preferred that the polymers A and B are selected from different classes of polymers. Without wishing to be limited by theory, it is believed that the two polymers A and B, when dissolved in water, form a complex with a solubility lower than each of the polymers A and B, which helps in enhanced deposition and other benefits.

[0032] Homopolymer or copolymer of vinyl pyrrolidone has a molecular mass of preferably from 1000 to 10000000, more preferably from 10,000 to 1,000,000 and most preferably from 30,000 to 500,000. Commercially available polyvinyl pyrrolidone can be used, one example of which is LUVISKOL® (BASF).

[0033] Homopolymer or copolymer of poly alkylene oxide has a molecular mass greater than 20,000. The molecular mass is preferably from 20,000 to 1,000,000, more preferably from 30,000 to 500,000 and most preferably from 50,000 to 200,000

Homopolymer or copolymer of saccharide has a molecular mass of preferably from 1000 to 10^9 , more preferably from 10,000 to 10^3 and most preferably from 100,000 to 10^9 . Any commercially available poly alkylene oxide, for example POLYOX® (Dow Chemical Co) can be used according to the present invention.

[0034] Polymer B may be synthetic or natural. However, synthetic polymer is preferred over natural polymer.

[0035] According to a preferred aspect, the polymer B is water soluble.

[0036] It is particularly preferred that the polymer B is selected from a class consisting of homopolymers or copolymers of vinyl pyrrolidone or alkylene oxide.

[0037] The amount of polymer B is preferably from 0.005 to 2, more preferably from 0.02 to 1, and most preferably from 0.05 to 0.5 mg per cm^2 area of the fabric.

[0038] Some examples of combinations of polymer A and polymer B, which are particularly preferred, are given below.

Table 1: Preferred combination of the polymers

Polymer A	Polymer B
Polyacrylic acid (PAA)	Poly vinyl pyrrolidone (PVP)
Polyacrylic acid (PAA)	Polyethylene Oxide(PEO)
Polyethylene Glycol (PEG)	Polyacrylic acid (PAA)
Poly vinyl alcohol (PVA)	Polyacrylic acid (PAA)
Poly vinyl alcohol (PVA)	Polyethylene Oxide (PEO)
Sodium carboxymethyl cellulose (SCMC)	Polyethylene Oxide (PEO)
Hydroxyethyl cellulose	Polyacrylic acid(PAA)

[0039] Most preferred combinations of the polymers are the ones in the first three rows in the Table 1 above, i.e. PAA-PVP, PAA-PEO and PEG-PAA.

Aqueous medium

[0040] According to the invention, the two polymers are contacted with the fabric in an aqueous medium having pH less than 6. The aqueous medium has pH preferably less than 5 and more preferably less than 4. Aqueous medium has pH preferably greater than 1 and more preferably greater than 2.

[0041] The polymers may be chosen in such a way that when the polymers are added to the aqueous medium, pH of the aqueous medium is less than 6. Preferably, an acidic ingredient is added to aqueous medium to ensure that the pH of the aqueous medium is less than 6. Acidic ingredients that reduce pH of resulting aqueous medium to less than 6 are well known to a person skilled in the art and any suitable acidic ingredient may be chosen.

[0042] The aqueous medium may comprise either polymer A, or polymer B, or both the polymers. Alternatively, one or both the polymers may be added to the aqueous medium during the process of the present invention.

Polymer A, when mixed with the aqueous medium, is from 0.005 to 10%, more preferably from 0.05 to 5%, and most preferably from 0.05 to 2% by weight of the aqueous medium.

[0043] Polymer B, when mixed with the aqueous medium, is from 0.005 to 10%, more preferably from 0.01 to 5%, and most preferably from 0.01 to 2% by weight of the aqueous medium.

[0044] The aqueous medium preferably comprises an electrolyte. The electrolyte is preferably from 0.001 to 5%, more preferably from 0.01 to 1%, and most preferably from 0.04 to 0.2% by weight of the aqueous medium.

[0045] Without wishing to be limited by theory, it is believed that the addition of electrolyte allows the process of the invention to be carried out with relatively low amounts of polymers A and B.

[0046] Electrolytes that can be used according to the present are selected from chlorides, sulphates or nitrates of sodium, potassium, magnesium or calcium. Calcium salts are particularly preferred.

[0047] According to a preferred aspect, the aqueous medium comprises no more than 200 ppm anionic surfactant. The aqueous medium comprises no more than 100 ppm, more preferably less than 50 ppm anionic surfactant. It is particularly preferred that the aqueous medium is substantially free of anionic surfactant.

[0048] The aqueous medium preferably comprises of at least one benefit agent. The benefit agent that can be included in the aqueous medium includes, but not limited to ingredients such as perfume, fluorescer, deodorant, antibacterial agent, shading dys and bluing agent. One of the advantages of the present invention is that the deposition of benefit agent is enhanced.

Process sequence

[0049] It is envisaged that the fabric is contacted with the polymers A and B either sequentially in any order, or simultaneously. Accordingly the fabric may be contacted with polymer A, followed by contacting with polymer B. Alternatively the fabric may be contacted with polymer B, followed by contacting with polymer A. The fabric may be simultaneously contacted with both the polymers A and B. Although the fabric may be contacted simultaneously with both the polymers, it is preferred that the fabric is contacted with the polymers sequentially, in any order.

Process of contacting

[0050] The step of contacting the fabric with polymers A and B can be carried out in any suitable manner.

[0051] Polymers A, or polymer B, or both, are mixed with the aqueous medium prior to contacting with the fabric. Alternatively, polymer A may also be mixed with a nonaqueous medium including solvents such as alcohol and acetone prior to contacting with the fabric. However, it is preferred that the polymer or polymers are mixed with the aqueous medium prior to contacting with the fabric. The fabric may be dipped into the aqueous medium comprising one or more polymers. Alternatively, the aqueous medium comprising one or both the polymers may be sprayed on the fabric.

[0052] It is also envisaged that either of the polymers A and B may be used in a form of abradable sticks which may be rubbed against the area of the fabric to be treated, followed by contact with the aqueous medium.

Composition

[0053] The compositions for the process of the invention typically comprise 1-99% by weight polymer A, 1-99% by weight polymer B, and 0 to 10% by weight an acidic ingredient wherein;

(a) polymer A is selected from the class consisting of homopolymers or copolymers of vinyl alcohol, alkylene glycol, saccharides, and carboxylic acid, and;

(b) polymer B is selected from the class consisting of homopolymers or copolymers of vinyl pyrrolidone, alkylene oxide, saccharides and carboxylic acid, and;

(c) an electrolyte selected from chlorides, sulphates or nitrates of sodium, potassium, magnesium or calcium; and

where polymers A and B are not of the same class and the pH of 1% aqueous solution of the composition is less than 6.

[0054] The composition comprises preferably 5-95%, more preferably 10-90% and most preferably 20-80% by weight polymer A. The composition comprises preferably 5-95%, more preferably 10-90% and most preferably 20-80% by weight polymer B.

[0055] The polymers may be chosen in such a way that pH of 1% aqueous solution of the composition is less than 6. Preferably, an acidic ingredient is present in the composition at 0.1-10% by weight of the composition to ensure that the pH of 1% aqueous solution of the composition is less than 6. Acidic ingredients that reduce pH of resulting aqueous medium to less than 6 are well known to a person skilled in the art and any suitable acidic ingredient may be chosen.

Kit

[0056] A kit for treatment of a fabric may be provided comprising the composition and a set of instructions for use.

[0057] It is particularly preferred that the polymers A and B are separately packaged, i.e. the polymers A and B are packaged individually in separate packs or in separate compartments of a twin compartment package.

Examples

[0058] The invention will now be demonstrated with examples. The examples are by way of illustration only and do not limit the scope of the invention in any manner.

Materials and methods

[0059] Following materials were used in the examples.

Table 2: Materials used in the examples

Material	Source/ Supplier
Water	Deionized water
Polyvinyl pyrrolidone molecular mass 90000 and 1,300,000	Aldrich
Polyacrylic acid, molecular mass 2000	Aldrich
Polyacrylic acid, sodium salt, molecular mass 8000	Aldrich
Polyacrylic acid, molecular mass 450000	Aldrich
Polyvinyl alcohol molecular mass 124,000	Aldrich
Polyethylene glycol, Molecular mass 17500	Fluka
Polyethylene oxide Molecular mass 100000	Aldrich
Polyester fabric	Bombay Dyeing
Polycotton fabric	Bombay Dyeing 67/33
Carbon soot	Cabot India N220

Deposition

[0060] Polymer A was polyacrylic acid of molecular mass 450000 in examples 1 and 2 and comparative examples 1-A to 2-B. Polymer B was polyvinyl pyrrolidone of molecular mass 90000, in example 1 and comparative examples A and B. Polymer B in example 2 and comparative examples C, D, and 2A was polyethylene oxide molecular mass 100,000.

[0061] For deposition studies about 10 g of fabric was treated with the polymers in solution and the weight gain was determined gravimetrically after drying of treated fabrics.

Table 3: Deposition of polymers on cotton, polycotton and polyester fabrics

Ex No	Polymer A (% by weight in aqueous medium)	Polymer B (% by weight in aqueous medium)	pH	Total polymer deposited (g/100 g fabric) Cotton	Total polymer deposited (g/100 g fabric) Polycotton	Total polymer deposited (g/100 g fabric) Polyester
1	1	1	2.8	4.41	2.67	3.41
A	2	-	2.5	0.90	0.96	0.96
B	-	2	5.2	0.87	0.70	0.78
2	0.5	0.5	3.2	2.67	2.68	4.37
C	1	-	2.6	1.40	1.72	1.30
D	-	1	5.5	1.68	0.80	1.19
2A	0.5	0.5	8.0	1.49	1.52	1.27

[0062] From the results, it can be seen that the deposition of two polymers when used together according to the

process of the present invention is significantly higher in comparison to the fabrics treated with only one of the polymers.

Soiling

Soiling Protocol

[0063] Fabric was treated with polymer and dried. Dried fabric was dipped in carbon soot dispersion (150 ppm) in water which was stabilized by addition of sodium alkylbenzene sulfonate (50 ppm). The fabric was removed from the carbon soot solution and immediately rinsed in water and dried. Change in reflectance (ΔR), i.e. the difference in reflectance of the fabric before and after soiling, was a measure of soiling of fabric, with negative value of ΔR indicating that the fabric was soiled.

[0064] In the following table, following abbreviations are used

PEG 17500 - polyethylene glycol, molecular mass 17,500.

PAA 8000 - polyacrylic acid, molecular mass 8,000.

PVA 124000 - polyvinyl alcohol, molecular mass 125,000.

PVP 90000 - polyvinyl pyrrolidone molecular mass 90,000.

Table 4: Soiling of cotton fabrics with carbon soot

Example No	Polymer A (% by weight in aqueous medium)	Polymer B (% by weight in aqueous medium)	pH	ΔR_{460}^* (Final - Initial) After dipping cotton fabric in carbon soot
3	PEG 17500 (0.05%)	PAA 8000 (0.05%)	3.2	-1.7
4	PVA 124000 (0.05%)	PAA 8000 (0.05%)	3.4	-4.7
5	PAA (0.05%)	PVP 90000 (0.05%)	4.3	-0.1
E	PEG 17500 (0.1%)	-	5.5	-31.7
F	-	PAA - 8000(0.1%)	3.3	-14.7
G	PVA 124000 (0.1%)	-	5.9	-22.7
H	-	PVP 90000 (0.1%)	6.9	-27.7
I	-	-	7.0	-37.7

[0065] From the results, it can be seen that the soiling of fabrics treated by the process of the present invention is significantly less than untreated fabric (comparative example I) or for the fabrics treated with only one of the polymers (comparative examples F, G and H).

Cleaning

Cleaning Protocol

[0066] Fabric was treated with polymer and dried. Dried fabric was dipped in carbon soot dispersion (150 ppm) in water which is stabilized by addition of sodium alkylbenzene sulfonate (50 ppm). The fabric was then dried. The dried fabric was then cleaned with water, sodium carbonate (0.15% by weight) solution in water, and commercially available detergent (SURF EXCEL® 0.3% by weight) in water. Change in reflectance (ΔR) was a measure of cleaning of fabric. Higher values of ΔR indicate better cleaning.

[0067] Polymer A was polyacrylic acid of molecular mass 2000 and polymer B was polyvinyl pyrrolidone of molecular mass 90000. In Example 6, both the polymers were used at 0.2 % by weight of the aqueous medium. The pH of aqueous medium was 3.0. In comparative examples J and K, polymers A and B were used alone, respectively, each at 0.4% by weight of the aqueous medium (pH 2.7 and 7.0, respectively). Comparative example L is for untreated fabrics (pH 7). The fabrics (cotton, polycotton and polyester) were cleaned according to the protocol given and the results are tabulated below

Table 5: Cleaning of fabrics soiled with carbon soot

Ex No	$\Delta R460^*$ after washing with sodium carbonate)			$\Delta R460^*$ after washing with water)			$\Delta R460^*$ after washing with SURF EXCEL®)		
	C*	PC**	PE***	C	PC	PE	C	PC	PE
6	21.9	18.9	21.9	18.2	7.2	17.1	13.5	22.5	28.2
J	12.7	6.7	5.4	12.4	4.1	3.6	14.5	9.5	7.4
K	8.8	7.4	7.2	12.3	2.4	8.9	14.6	9.5	11.4
L	14.0	2.6	3.0	15.0	4.2	2.7	13.7	6.9	4.9
C* - Cotton PC** - Polycotton PE*** - Polyester									

[0068] From the results, it is clear that the cleaning efficacy for example 6, is higher than the cleaning efficacy obtained in the comparative examples J, K and L which are outside the scope of the present invention. In particular, the cleaning efficacy is better in case of washing with sodium carbonate or water. Further, the results show that cleaning efficacy is particularly enhanced for polycotton and polyester fabrics, when washing is with commercially available surfactant.

Effect of electrolyte

[0069] Polymer A was polyacrylic acid of molecular mass 450,000 and polymer B was polyvinyl pyrrolidone of molecular mass 1,300,000. In all the examples, both the polymers were used at 0.1 % by weight of the aqueous medium. The effect of electrolyte addition was studied by adding various electrolytes at 0.1% by weight of the total aqueous medium. The pH of aqueous media was in the range 2.7 to 3.0. The fabrics (cotton, polycotton and polyester) were cleaned using sodium carbonate (0.15% by weight) solution in water. The results are tabulated below in terms of cleaning efficacy.

Table 6: Effect of addition of electrolyte

Ex No	Electrolyte	$\Delta R460^*$ after washing with sodium carbonate)		
		C*	PC**	PE***
7	Sodium chloride	6.8	5.6	4.5
8	Magnesium Chloride	9.1	19.9	12.4
9	Calcium chloride	26.3	32.4	30.9
10	-	9.8	1.5	2.8

[0070] From the results, it is clear that the addition of an electrolyte leads to further enhancement of cleaning efficacy, in particular for polycotton and polyester fabrics. Further, for cotton fabrics, calcium chloride in particular gives enhancement in cleaning efficacy.

Perfume deposition

Protocol

[0071] Allyl amyl glycollate was taken as a representative perfumery ingredient. Polymer A was polyacrylic acid having molecular mass of 450,000 and polymer B was polyvinyl pyrrolidone having molecular mass of 90000. The perfume was added together with both the polymers A and B each at 0.1% by weight of the aqueous medium (Example 11 - pH 2.8), polymer A and polymer B alone each at 0.2% by weight of the aqueous medium (comparative example M - pH 3 and N - pH 7, respectively), whilst comparative example O (pH 7) was for untreated fabric. The perfume retention was evaluated for various types of fabrics. The fabrics were tested for perfume retention by a trained perfumer on the scale of 0 to 5 with score of 0 indicating no perfume impact and score of 5 indicating maximum perfume impact. The details are tabulated below.

Table 7: Deposition of perfume on fabrics

Ex No	Perfume impact score (Cotton)	Perfume impact score (Polycotton)	Perfume impact score (Polyester)
11	2.5	1.5	2.5
M	0.5	0.5	0.75
N	0.5	0.5	0.75
O	0.5	0.5	0.5

[0072] From the results tabulated above, it is clear that the perfume impact at 60 minutes is significantly higher for the fabric treated according to the process of the present invention.

Fluorescer deposition

[0073] Following experiments were carried out using 2 ppm CBSX® (CIBA) as fluorescer. Details of polymers A and B are tabulated below along with the results in terms of whiteness score as measured by reflectance value on cotton.

Table 8: Deposition of fluorescer on fabrics

Ex No	Polymer A	Polymer B	R460 (Cotton)
12	PAA (2.5%)	PEG (2.5%)	95.9
P	PAA (5%)	-	94.7
Q	-	PEG (5%)	89.9
R	-	-	85.7

[0074] From the results, it is clear that the fluorescer deposition as indicated by whiteness score is enhanced when the fabric is treated with both the polymers A and B according to the process of the present invention (Example 12) as compared with untreated fabric (Comparative example R) or fabric treated with only one of the polymers (Comparative Examples P and Q).

[0075] It will be appreciated that the above examples clearly and sufficiently describe the manner in which the process of the present invention can be practiced. It will be further appreciated that the process of the present invention is capable of meeting the object of providing a process for treatment of fabric that reduces soiling of fabrics, improves efficacy of subsequent cleaning, allows enhanced deposition of benefit agents and is effective on various types of fabrics including cotton, polycotton and polyester.

Claims

1. A process for treatment of a fabric comprising the steps of contacting the fabric with polymers A and B in an aqueous medium, wherein;

(a) polymer A is selected from the class of homopolymers or copolymers of vinyl alcohol, alkylene glycol, saccharides, and carboxylic acid, and;

(b) polymer B is selected from the class of homopolymers or copolymers of vinyl pyrrolidone, alkylene oxide, saccharides and carboxylic acid, and;

(c) an electrolyte selected from chlorides, sulphates or nitrates of sodium, potassium, magnesium or calcium; and

where polymers A and B are not of the same class and the aqueous medium has pH less than 6.

2. A process as claimed in claim 1 wherein the aqueous medium comprises no more than 200 ppm anionic surfactant,

3. A process as claimed in any one of the preceding claims wherein said polymer A is selected from homopolymer or copolymer of vinyl alcohol or carboxylic acid.

4. A process as claimed in any one of the preceding claims wherein said polymer B is selected from homopolymer or copolymer of vinyl pyrrolidone or alkylene oxide.
5. A process as claimed in any one of the preceding claims wherein said homopolymer or copolymer of carboxylic acid is polyacrylic acid or a copolymer thereof.
6. A process according to anyone of the preceding claims wherein said electrolyte is from 0.001 to 5% by weight of said medium.
7. A process as claimed in any one of the preceding claims wherein pH of said aqueous medium is from 1 to less than 6.
8. A process as claimed in any one the preceding claims wherein the fabric is contacted with the polymers A and B either sequentially in any order, or simultaneously.

Patentansprüche

1. Verfahren zur Behandlung eines Gewebes, das die Schritte es In-Kontakt-Bringens des Gewebes mit Polymeren A und B in einem wässrigen Medium umfasst, wobei:

- (a) Polymer A ausgewählt ist aus der Klasse von Homopolymeren oder Copolymeren von Vinylalkohol, Alkylenglykol, Sacchariden und Carbonsäure, und
- (b) Polymer B ausgewählt ist aus der Klasse von Homopolymeren oder Copolymeren von Vinylpyrrolidon, Alkylenoxid, Sacchariden und Carbonsäure und
- (c) ein Elektrolyt ausgewählt ist aus Chloriden, Sulfaten oder Nitraten von Natrium, Kalium, Magnesium oder Calcium und

wobei Polymere A und B nicht zu derselben Klasse gehören und das wässrige Medium einen pH von kleiner als 6 hat.

2. Verfahren, wie es in Anspruch 1 beansprucht wird, wobei das wässrige Medium nicht mehr als 200 ppm an anionischem Tensid umfasst.
3. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei das Polymer A aus Homopolymer oder Copolymer von Vinylalkohol oder Carbonsäure ausgewählt wird.
4. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei das Polymer B aus Homopolymer oder Copolymer von Vinylpyrrolidon oder Alkylenoxid ausgewählt wird.
5. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei das Homopolymer oder Copolymer von Carbonsäure Polyacrylsäure oder ein Copolymer davon ist.
6. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei der Elektrolyt 0,001 bis 5 Gew.-% des Mediums ausmacht.
7. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei der pH des wässrigen Mediums von 1 bis weniger als 6 ist.
8. Verfahren, wie es in einem der vorangehenden Ansprüche beansprucht wird, wobei das Gewebe mit den Polymeren A und B entweder der Reihe nach in beliebiger Reihenfolge oder gleichzeitig in Kontakt gebracht wird.

Revendications

1. Procédé de traitement d'un tissu, comprenant les étapes de mise en contact du tissu avec des polymères A et B dans un milieu aqueux, dans lequel :

- (a) le polymère A est choisi dans la classe des homopolymères ou des copolymères d'alcool vinylique, d'alkylèneglycol, de saccharides et d'acide carboxylique, et ;

(b) le polymère B est choisi dans la classe des homopolymères ou des copolymères de vinyl pyrrolidone, d'oxyde d'alkylène, de saccharides et d'acide carboxylique, et ;
(c) un électrolyte choisi parmi les chlorures, les sulfates ou les nitrates de sodium, de potassium, de magnésium ou de calcium ; et

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les polymères A et B ne sont pas de la même classe et le milieu aqueux possède un pH inférieur à 6.

2. Procédé selon la revendication 1, dans lequel le milieu aqueux comprend au plus 200 ppm de tensioactif anionique.

10 3. Procédé selon l'une quelconque des revendications précédentes, dans lequel ledit polymère A est choisi parmi un homopolymère ou un copolymère d'alcool vinylique ou d'acide carboxylique.

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel ledit polymère B est choisi parmi un homopolymère ou un copolymère de vinyl pyrrolidone ou d'oxyde d'alkylène.

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5. Procédé selon l'une quelconque des revendications précédentes, dans lequel ledit homopolymère ou copolymère d'acide carboxylique est un poly(acide acrylique) ou l'un de ses copolymères.

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6. Procédé selon l'une quelconque des revendications précédentes, dans lequel ledit électrolyte représente 0,001 % à 5 % en poids dudit milieu.

7. Procédé selon l'une quelconque des revendications précédentes, dans lequel le pH dudit milieu aqueux va de 1 à moins de 6.

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8. Procédé selon l'une quelconque des revendications précédentes, dans lequel le tissu est mis en contact avec les polymères A et B soit de manière séquentielle dans n'importe quel ordre, soit simultanément.

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REFERENCES CITED IN THE DESCRIPTION

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