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(54) **LIGHT-FAST DYEINGS ON BICOMPONENT FIBRES**

LICHTTECHTE FÄRBUNGEN VON BIKOMPONENTENFASERN

COLORATIONS STABLES À LA LUMIERE DE FIBRES BICOMPOSÉS

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• **PATENT ABSTRACTS OF JAPAN vol. 1999, no. 03, 31 March 1999 (1999-03-31) & JP 10 331034 A (UNITIKA LTD), 15 December 1998 (1998-12-15)**

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Description

[0001] This invention relates to a process for dyeing multicomponent fibres especially for dyeing bi- and tricomponent fibres, the dyeings being notable for excellent light-fastness. This invention further also relates to the light-fast multicomponent fibres dyed thereby.

[0002] Unmodified polyolefin fibres, especially polypropylene (PP) fibres, are dyeable with the usual disperse dyes only in extremely pale shades having very low fastnesses. Prior art ways to improve dyeability include, on the one hand, chemically modifying polyolefin fibres (especially polypropylene (PP) fibres) and on the other to use modified or newly synthesized dyes.

[0003] JP 10-331034 relates to a fiber having excellent moisture absorbing and releasing property and suitable as a fiber for textile improved in heat resistance and light resistance of the fiber itself by including a specific amount of phenolic antioxidant in a core component and including a specific amount of benzotriazole-based ultraviolet light absorbent in a sheath component. Nothing is disclosed about light fast dyeings on bicomponent fibers.

[0004] EP445076 relates to stable dispersions of benzotriazole ultraviolet (U.V.) absorbing agents utilizing modified ligninsulfonates as the dispersing agent, a method of dispersing the benzotriazole U.V. absorbing agents, a method of protecting textiles by utilizing the stable dispersions and textiles treated with the stable dispersions avoiding that any undispersed U.V. absorbing agent is filtered out, producing deposits. Nothing is disclosed about light fast dyeings on bicomponent fibers.

[0005] EP474595 relates to stable aqueous dispersions of UV-absorbing benzotriazole compounds wherein these dispersions are excellent compositions for improving the light fastness of dyeings on synthetic fibres, in particular polyester fibres or acid-modified polyester fibres. However, nothing is disclosed about light fast dyeings on bicomponent fibers.

[0006] US5221287 relates to a process for the photochemical and thermal stabilization of polyamide fibres having an affinity for acid and basic dyes, and of blends of said fibres with one another and with other fibres. However, nothing is disclosed about light fast dyeings on bicomponent fibers.

[0007] It has now emerged that suitable process management and suitable dispersions of dyes which can also be used for dyeing polyester fibres make it possible to obtain good light-fast dyeing results if the dyeing is additionally treated, the treatment being effected with benzotriazole derivatives in particular.

[0008] It has now been found that the dyeings of multicomponent fibres especially after the dyeing of bicomponent fibres composed of a thermodynamically compatible polyolefin and polyamide with disperse dyes have a high light-fastness when the multicomponent fibres are subjected to treatment with benzotriazole derivatives.

[0009] This invention further also relates to the light-fast multicomponent fibres dyed by the process of the present invention.

[0010] This invention also relates to the use of benzotriazole derivatives for enhancing the light-fastness of dyed multicomponent fibres especially after the dyeing of bicomponent fibres composed of a thermodynamically compatible polyolefin and polyamide.

[0011] The multicomponent fibres according to the invention are side-by-side fibres (the two or more different polymers are side by side without being a blend nor in a different fibre - thus bonded together and therefore forming a single fibre), sheath-core fibres (a first polymer forms a core portion and a second polymer forms a sheath around the first polymer, and optionally further polymers form a sheath around the inner core-and-sheath-structure) or islands-in-a-sea (multiple core portions of a first polymer are surrounded by a second sheath polymer) fibres. The sheath-core fibres and the islands-in-a-sea fibres are the preferred multicomponent fibres, while the sheath-core fibres are the even more preferred fibres. In the preferred sheath-core fibres the sheath is arranged concentrically around the core portion.

[0012] Preferred multicomponent fibres especially bicomponent fibres consist of a thermodynamically compatible polyolefin and polyamide, in particular of polypropylene, modified polyamide (PA) and polyamide.

[0013] Preferred multicomponent fibres or to be more precise bicomponent fibres have a polyfilamentary character.

[0014] More preferred multicomponent fibres especially bicomponent fibres consist of a core of one polymer (preferably the polyamide) which is sheathed by the other polymer (preferably by the polyolefin). The fibres composed of a thermodynamically compatible of polypropylene and polyamide, especially polypropylene and nylon 6 (PP/N6), are produced by conventional spinning processes such that fine filaments of one polymer (preferably polyamide) are formed in the matrix of the other polymer (preferably the polyolefin). When two melts are fed simultaneously to a spinneret hole results a bicomponent filament is resulting. Spinnerets with two concentric holes yield sheath-core filaments (bicomponent sheath-core fibres) from two melts.

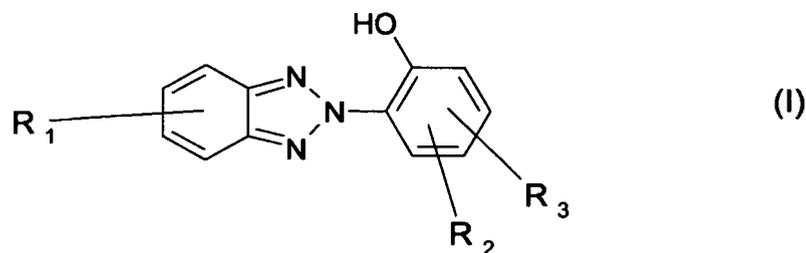
[0015] To improve the adhesion between the PA and the PP it is possible to utilize ionomer (IM), maleic anhydride or alternatively a polyester. These agents for enhancing the compatibility between the various components may be present in amounts of up to 10 per cent by weight, but preferably from 3 to 8 per cent by weight.

[0016] The preferred multicomponent fibres especially bicomponent fibres according to the invention are dyed in the one component and the benzotriazole derivatives are applied in the other portion of the multicomponent fibre or bicomponent fibres. The dyestuff and the benzotriazole derivative are not located in the same component of the multicomponent

fibres.

[0017] The preferred multicomponent fibres especially bicomponent fibres according to the invention are dyed in the core portion and the benzotriazole derivatives are applied in the sheath portion of the multicomponent fibre or bicomponent fibres. The preferred multicomponent fibres according to the invention are bicomponent fibres.

[0018] Preferred benzotriazole derivatives are benzotriazole derivatives of the formula (I)



where

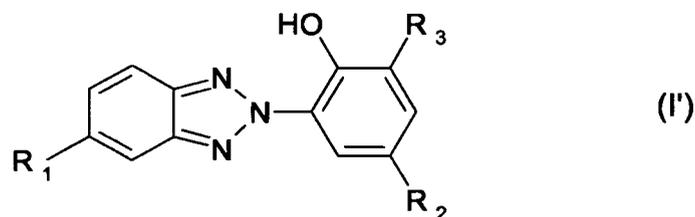
20 R_1 is a halogen atom,
 R_2 is a C_1 to C_6 alkyl, and
 R_3 is a C_1 to C_6 alkyl.

[0019] Preferably R_3 is a branched C_3 to C_6 hydrocarbyl radical.

[0020] In a preferred benzotriazole of the formula (I)

30 R_1 is chlorine or fluorine,
 R_2 is a methyl, ethyl or propyl, and
 R_3 is a methyl, ethyl or propyl, isopropyl or tertiary butyl.

[0021] Very particularly preferred benzotriazoles of the formula (I) have the formula (I')



where

45 R_1 is a halogen atom,
 R_2 is a C_1 to C_6 alkyl, and
 R_3 is a C_1 to C_6 alkyl.

[0022] In a preferred benzotriazole of the formula (I')

50 R_1 is chlorine or fluorine,
 R_2 is a methyl, ethyl or propyl, and
 R_3 is a methyl, ethyl or propyl, isopropyl, tertiary butyl.

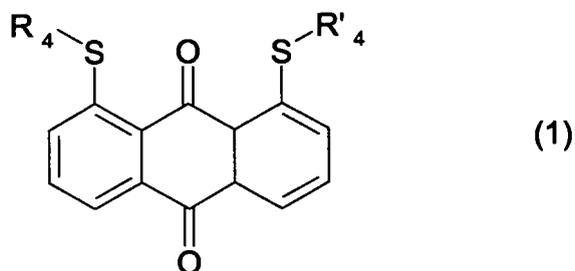
[0023] Very particular preference is given to the benzotriazole derivative of the formula (I') wherein R_1 is chlorine, R_2 is methyl and R_3 is tertiary butyl.

[0024] The benzotriazole derivative is used in an amount of 0.01 to 20 per cent by weight based on the dry material preferably 0.01 especially 0.1 to 15 per cent by weight based on the dry material, but in particular 0.1 to 10 per cent by weight based on the dry material in the process of the present invention.

[0025] The treatment with the benzotriazole derivative can take place after the dyeing or else concurrently during the dyeing. Dyeing for the purposes of the present invention includes printing.

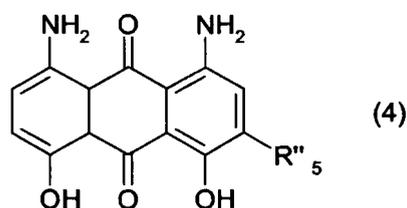
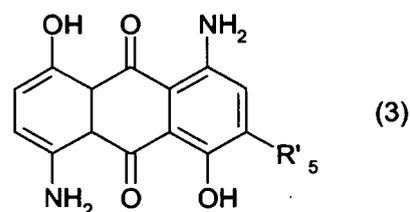
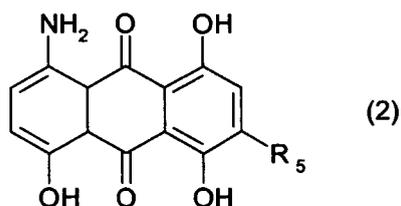
[0026] Disperse dyes for the process of the present invention are those which are customarily also used for dyeing polyester materials, but have high light-fastnesses on polyamide too.

[0027] Preferred disperse dyes for the process of the present invention are disperse dyes having the formulae (1)



where R_4 and R'_4 are independently a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH.

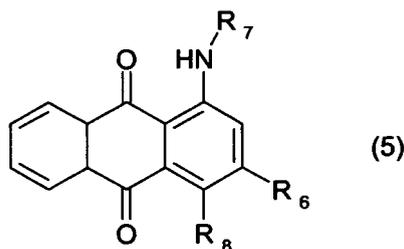
[0028] More preferred disperse dyes for the process of the present invention are disperse dyes having the formulae (2), (3) or (4)



where R_5 , R'_5 , and R''_5 are independently halogen, in particular -Cl or -Br, a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH.

[0029] More preferred disperse dyes for the process of the present invention are disperse dyes having the formulae (5)

5



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where

15 R_6 is halogen, in particular -Cl or -Br, a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or a phenoxy group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH,

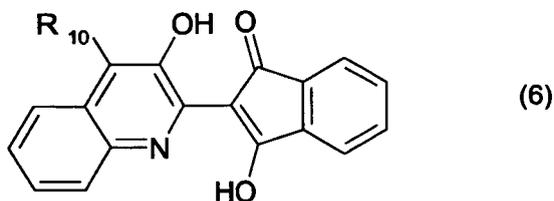
R_7 is a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH,

20 R_8 is -NH₂ or -NHR₉, where R_9 is halogen, in particular -Cl or -Br, a phenyl group or a phenyl group or phenoxy group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or a phenoxy group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or R_9 is a group of the formula SO₂-phenyl where the phenyl group of the SO₂-phenyl group is not substituted, or is a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or is a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH.

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[0030] More preferred disperse dyes for the process of the present invention are disperse dyes having the formulae (6)

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40 where

R_{10} is -H or halogen, in particular -H, -Cl or Br.

45 **[0031]** Very particularly suitable disperse dyes of the formulae (1), (2), (3), (4), (5) or (6) for the process of the present invention are C. I. Disperse Orange 41 and/or C. I. Disperse Orange 41:1 and/or C. I. Disperse Violet 36 and/or C. I. Solvent Yellow 163 and/or C. I. Disperse Blue 73 and/or C. I. Disperse Blue 56 and/or C. I. Disperse Red 86 and/or C. I. Disperse Red 60 and/or C. I. Disperse Violet 27 and/or C. I. Disperse Yellow 64 and/or C. I. Disperse Yellow 54.

[0032] These dyes of the formulae (1), (2), (3), (4), (5) or (6) can be used alone or as mixtures comprising one of the abovementioned disperse dyes in the process of the present invention.

50 **[0033]** The dyeing or printing in the process of the present invention is done in accordance with processes known per se, for example the processes described in French Patent No. 1 445 371. The customary dyeing processes whereby the processes of the present invention can be dyed and/or printed with disperse dyes are also described for example in M. Peter and H.K. Rouette: "Grundlagen der Textilveredelung; Handbuch der Technologie, Verfahren und Maschinen", thirteenth, revised edition, 1989, Deutscher Fachverlag GmbH, Frankfurt/Main, Germany, ISBN 3-87150-277-4, in which the following pages are particularly relevant: the pages 460-461, 482-495, 556-566 and 574-587. Possibilities for mats and carpets include the continuous or batch dyeing process and also the contactless dyeing or the classic printing or spraying of the dyes or formulations of the dyes by the ChromoJet process or other processes (M. Peter and H.K. Rouette: "Grundlagen der Textilveredelung; Handbuch der Technologie, Verfahren und Maschinen", thirteenth, revised

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edition, 1989, Deutscher Fachverlag GmbH, Frankfurt/Main, Germany, ISBN 3-87150-277-4, pages 484 to 492 (chapter 7.221.1) and page 846 and Figure 8.70).

[0034] The dyeings obtained have good all-round fastnesses; to be mentioned in particular are the light-fastness, fastness to heat setting and pleating and also the excellent wet-fastnesses, after thermal stabilization (thermomigration-fastness), but in particular the high light-fastness.

[0035] The textile material mentioned may be present in the various processing forms, for example as fibre, yarn or web, as a woven or loop-formingly knitted fabric or in the form of carpets. These textiles find utility in the automotive sector or generally in transit engineering such as rail, aeroplanes and/or trams, in the technology of built structures or to be more precise in or on built structures and/or in the leisure sector.

[0036] The disperse dyes are applied to the textile materials by known dyeing processes. For example, polyolefin-polyamide multicomponent fibres or bicomponent fibre materials are exhaust dyed from an aqueous dispersion in the presence of anionic or nonionic dispersants with or without customary carriers at temperatures between 70 and 140°C.

[0037] Fibre materials based on polyolefin-polyamide are preferably dyed at a pH of 3 to 7, and especially 3 to 6. The dyeing temperature is preferably in the range from 70 to 110°C, and especially in the range from 80 to 105°C.

[0038] The liquor ratio depends on the apparatus, the substrate and the make-up form. However, the liquor ratio can be chosen within a wide range, for example from 4 : 1 to 100 : 1 and preferably from 5 : 1 to 30 : 1.

[0039] The disperse dyes used according to the present invention can be applied in the customary dyeing processes, such as for example in the exhaust process, in the continuous process, in the printing process or in non-impact printing processes such as for example inkjet or the spray pressure/Chromojet particularly suitable for carpets.

[0040] The disperse dyes used according to the present invention are also suitable for dyeing from short liquors, as for example in continuous dyeing processes or batch and continuous foam dyeing processes.

[0041] The dyeing liquors or printing pastes, in addition to water and the dyes, may contain further additives, for example wetting agents, antifoams, levelling agents or agents to influence the properties of the textile material, for example fabric softeners, flame retardants or soil, water and oil repellents and also water softeners and natural or synthetic thickeners, examples being alginates and cellulose ethers.

[0042] The amounts in which the disperse dyes are used in the dyebaths or printing pastes can vary within wide limits depending on the desired depth of shade. Advantageous amounts will generally be in the range from 0.01 % (0.001 % to 20% by weight) to 15% by weight and especially 0.1% to 10% by weight, based respectively on weight of fibre and the printing paste.

[0043] The various dyeing and printing processes for carpets are preferably carried out as follows:

[0044] A liquor of the following composition is prepared for the continuous process:

| | | |
|------------|-----|--|
| 0.001 - 30 | g/l | of disperse dyes |
| 1-15 | g/l | of thickener, e.g. Polyprint M225, polysaccharide, guar, tamarind |
| 0.1-10 | g/l | of wetting and anti-frosting agents, e.g. Sandogen WAF liq., Sandogen AFB liq. |
| 0.1 - 10 | g/l | of an acid donor, e.g. Sandacid VS liq., Sandacid VAN liq. |
| 0.1 - 10 | g/l | of buffer systems, for example Sandacid PB liq., Sandacid PBBK liq. |
| 0.1 - 30 | g/l | of benzotriazole derivatives of the formula (I). |

[0045] The material to be dyed is padded in a pad-mangle to a wet pick-up of 100 - 600% preferably 400% and fixed for 8 min in hot saturated steam at around 102°C for 2 - 20 min; alternatively, fixing can also be effected with dry heat or superheated steam during the period indicated above. Thereafter, the material is rinsed with cold water and if appropriate further treated or further processed as customary in the industry.

[0046] A liquor of the following composition is prepared for the exhaust process:

| | | |
|------------|------|---|
| 0.001 - 20 | % | of disperse dyes |
| 0.1 - 10 | ml/l | of dispersant, e.g. Lyocol RDN liq., Lyocol OU liq. |
| 0.1 - 5 | g/l | of ammonium sulphate |
| 0.1 - 30 | g/l | of benzotriazole derivatives of the formula (I). |

[0047] The pH is adjusted to a value of 3 - 7 and preferably to a pH of 4.5 - 6. It is dyed at 70 - 140°C for 30 to 90 min and then rinsed with water and is if appropriate further treated or further processed as customary in the industry.

[0048] A printing paste of the following composition is prepared for the non-impact printing process:

| | | |
|------------|------|---|
| 0.001 - 30 | g/kg | of disperse dyes |
| 2 - 20 | g/kg | of synthetic thickener, e.g. Tanaprint ST 160, Prisulon 200, Texipol 675031 |

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(continued)

- 0.1 - 10 g/kg of dispersing, wetting, anti-frosting agent, e.g. Sandogen WAF liq., Sandogen AFB liq., Tanaspers CF liq.
- 5 0.1 - 10 g/kg of acid for pH adjustment, e.g. citric acid
- 0.1 - 10 g/kg of defoamer, for example Nofome 1125 liq., Antimussol UP liq., Antimussol SF liq.
- 0.1 - 30 g/l of benzotriazole derivatives of the formula (I).

10 **[0049]** The material to be printed in a non-impact printing process is sprayed with the printing paste to a pick-up of 100 - 600% and preferably 300% based on the dry weight of the material to be printed and the material is fixed with hot saturated steam at 102°C for 2 to 20 min (preferably 8 min), although dry heat or superheated steam can alternatively be used for fixing. Thereafter, the material is rinsed with cold water and is if appropriate further treated or further processed as customary in the industry.

15 **[0050]** Industry-customary further treatments or further processing operations may comprise finishing with fluorinated chemicals, other soil- and/or water-repellant chemicals and/or the application of a carpet backing.

[0051] The examples which follow illustrate the invention. Percentages are by weight unless stated otherwise.

Examples:

20 **[0052]** The dyeing examples utilized small pieces of carpet produced from a bicomponent fibre (PP/PA) from Aquafil Textile Yarns S.p.A., Via Parma, 45, IT - 46041 Asola - Mantova (Italy).

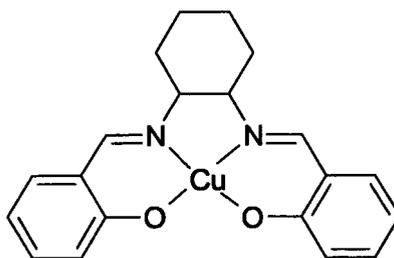
Example 1 (not according to invention)

25 **[0053]** Small pieces of carpet are padded in a pad-mangle in a bath containing 0.25 g/l of C.I. Solvent Yellow 163, 0.06 g/l of C.I. Disperse Red 86 and 0.009 g/l of C.I. Disperse Blue 73, 100 g/l of a 3.5% solution of Polyprint M225, 3 g/l of Sandogen WAF liq., 2 g/l of Sandacid VS liq., and sufficient Sandacid PB liq. for a bath pH of 5 to a wet pick-up of 400% (based on the dry weight), and the piece of carpet thus impregnated is fixed for 8 minutes in hot saturated steam at 102°C and subsequently washed with cold water. A beige dyeing was obtained on the piece of carpet. The

30 piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

Example 2 (not according to invention)

35 **[0054]** Small pieces of carpet are dyed as in Example 1, but the bath additionally contained 5 g/l of a 10% suspension of a compound of the formula

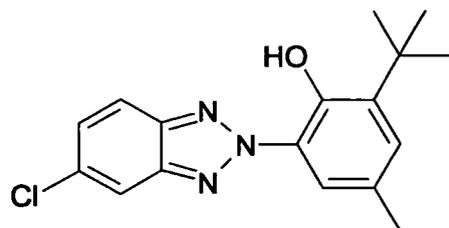


50 **[0055]** A beige dyeing was obtained in the piece of carpet. The piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

Example 3

55 **[0056]** Small pieces of carpet are dyed as in Example 1, but the bath additionally contained 5 g/l of a 25% suspension of a compound of the formula

5



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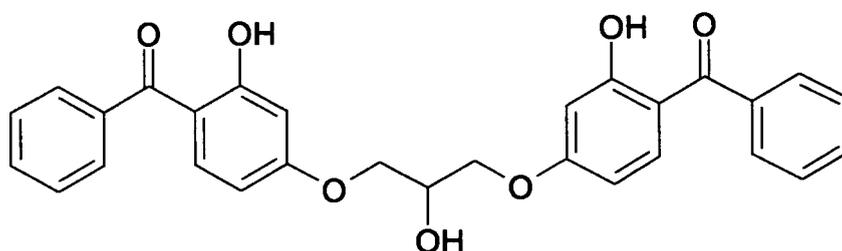
[0057] A beige dyeing was obtained in the piece of carpet. The piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

Example 4 (not according to invention)

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[0058] Small pieces of carpet are dyed as in Example 1, but the bath additionally contained 5 g/l of a 20% suspension of a compound of the formula

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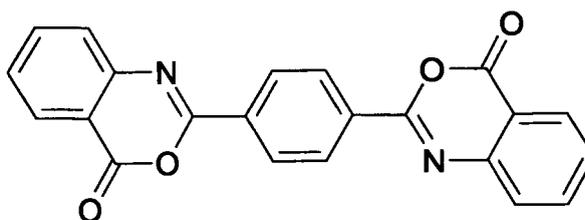
[0059] A beige dyeing was obtained in the piece of carpet. The piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

Example 5 (not according to invention)

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[0060] Small pieces of carpet are dyed as in Example 1, but the bath additionally contained 5 g/l of a suspension of 35 parts of a compound of the formula

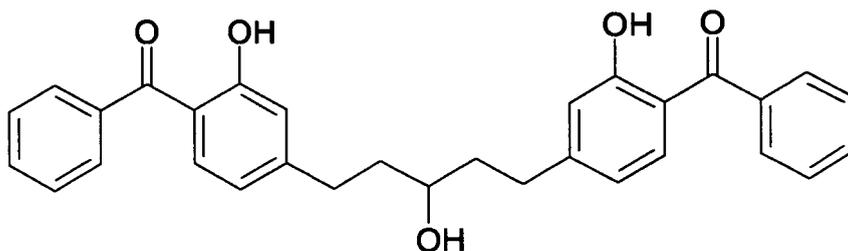
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and 35 parts of a compound of the formula

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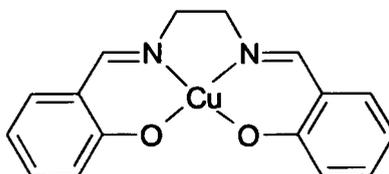
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[0061] A beige dyeing was obtained in the piece of carpet. The piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

Example 6 (not according to invention)

[0062] Small pieces of carpet are dyed as in Example 1, but the bath additionally contained 5 g/l of a 10% suspension of a compound of the formula



[0063] A beige dyeing was obtained in the piece of carpet. The piece of carpet thus obtained was tested for light-fastness (see hereinbelow).

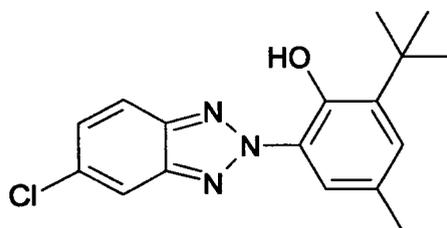
Measurement of light-fastness of Examples 1 to 7

[0064] Light-fastness was measured according to ISO 105 Method 2. A sample of the piece of carpet to be tested is exposed, half-covered, to light together with the blue light-fastness standards, which are pieces of wool cloth. Colour fastness is assessed by comparing the change in colour of the specimen with the change in colour of the light-fastness standards used. The specimen is exposed to a certain amount of light energy and the assessment was made not against the eight-step blue scale but against the five-step grey scale. This resulted in a colour fastness to light rating of 1 - 5.

| Example | Grey scale at exposure step BT6=GS4 | Grey scale at exposure step BT6=GS3-4 |
|---------|-------------------------------------|---------------------------------------|
| 1 | 2.1 | 1.2 |
| 2 | 2.8 | 1.2 |
| 3 | 3.6 | 2.7 |
| 4 | 2.1 | 1.5 |
| 5 | 1.6 | 1.2 |
| 6 | 2.3 | 1.2 |

Example 8

[0065] Small pieces of carpet are padded in a pad-mangle in a bath containing 0.30 g/l of C. I. Disperse Blue 73, 100 g/l of a 3.5% solution of Polyprint M225, 3 g/l of Sandogen WAF liq., 5 g/l of a 25% suspension of a compound of the formula



[0066] 2 g/l of Sandacid VS liq. and sufficient Sandacid PB liq. for a bath pH of 5 to a wet pick-up of 400% (based on the dry weight), and the piece of carpet thus impregnated was fixed for 8 minutes in hot saturated steam at 102°C and subsequently washed with cold water to obtain a piece of carpet having a reddish yellow colour of very good light-fastness.

Examples 9 to 16

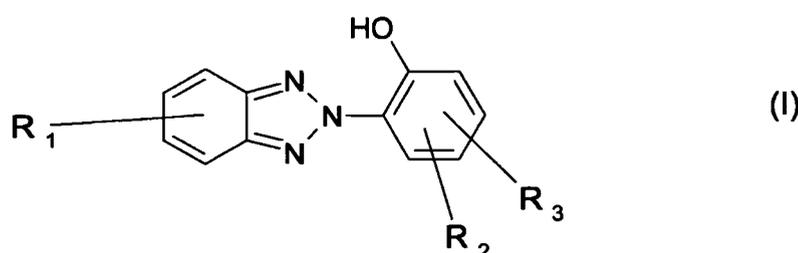
[0067] Small pieces of carpet are dyed as in Example 8, but instead of the 0.30 g/l of C.I. Disperse Blue 73 the bath contained 0.32 g/l of the following dye (F):

| Example | Dye (F) | Colour of dyed piece of carpet |
|---------|--------------------------|--------------------------------|
| 9 | C. I. Solvent Yellow 163 | reddish yellow |
| 10 | C. I. Disperse Blue 73 | pale blue |
| 11 | C. I. Disperse Blue 56 | blue |
| 12 | C. I. Disperse Red 86 | pink |
| 13 | C. I. Disperse Red 60 | bluish red |
| 14 | C. I. Disperse Violet 27 | reddish violet |
| 15 | C. I. Disperse Yellow 64 | pale yellow |
| 16 | C. I. Disperse Yellow 54 | pale yellow |

[0068] Pieces of carpet coloured in the stated colour and having very good light-fastness were obtained.

Claims

- Process for improving the light-fastness of dyeings on multicomponent fibres composed of a thermodynamically compatible polyolefin and polyamide with disperse dyes **characterized in that** the multicomponent fibres are subjected to a treatment with benzotriazole derivatives.
- Process according to Claim 1 **characterized in that** the benzotriazole derivatives are benzotriazole derivatives of the formula (I)



where

R₁ is a halogen atom,

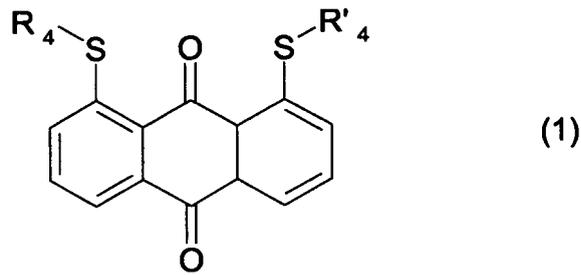
R₂ is a C₁ to C₆ alkyl, and

R₃ is a C₁ to C₆ alkyl.

- Process according to Claim 1 **characterized in that** the multicomponent fibres consist of a thermodynamically compatible polyolefin and polyamide, in particular of polypropylene, modified PA and polyamide, and preferably have polyfilamentary character.
- Process according to claim 1 **characterized in that** the multicomponent fibres consist of a core of a first polymer, which preferably is the polyamide, and **in that** this core is sheathed by a second polymer, which is preferably the polyolefin.
- Process according to Claim 1 **characterized in that** the benzotriazole derivative is used in an amount of 0.01 to 20 per cent by weight based on the dry material.

6. Process according to Claim 1 characterized in that the disperse dyes have the formulae (1)

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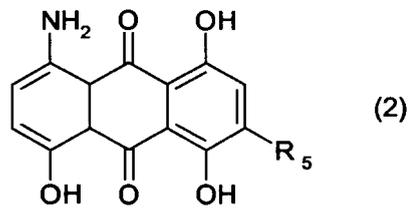


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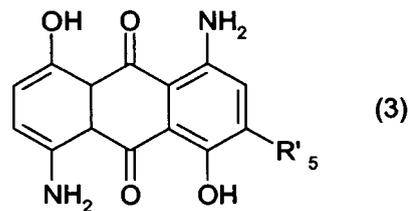
where R_4 and R'_4 are independently a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or the formulae (2), (3) or (4)

20



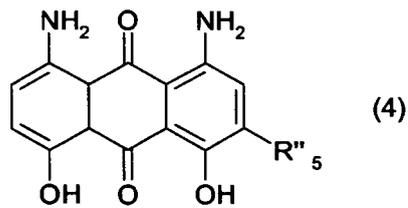
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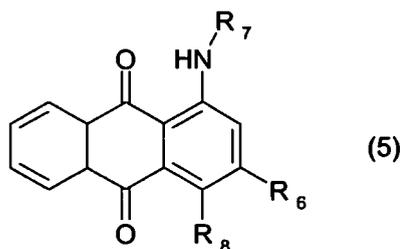


45

where R_5 , R'_5 , and R''_5 are independently halogen, in particular -Cl or -Br, a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or have the formulae (5)

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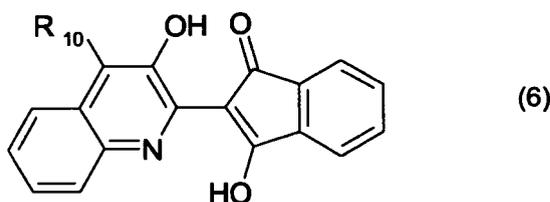
where

15 R_6 is halogen, in particular -Cl or -Br, a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or a phenyl group or a phenoxy group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH,

R_7 is a phenyl group or a phenyl group substituted by halogen, in particular -Cl or Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH,

20 R_8 is -NH₂ or -NHR₉, where R_9 is halogen, in particular -Cl or -Br, a phenyl group or a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or a phenyl group or a phenoxy group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or R_9 is a group of the formula SO₂-phenyl, where the phenyl group of the SO₂-phenyl group is not substituted, or is a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH, or is a phenyl group substituted by halogen, in particular -Cl or -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ or -OH,

25 or have the formulae (6)



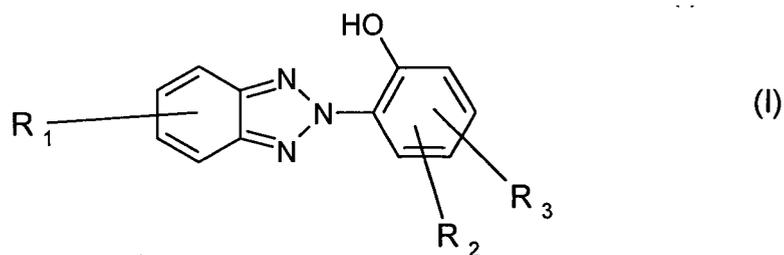
where

40 R_{10} is -H or halogen, in particular -H, -Cl or Br.

7. Light-fast dyed multicomponent fibres composed of a thermodynamically compatible polyolefin and polyamide dyed with disperse dyes **characterized in that** they have been subjected to a treatment with benzotriazole derivatives.
- 45 8. Use of light-fast dyed multicomponent fibres according to Claim 7 for producing carpets and/or textile floorcoverings.
9. Use of benzotriazole derivatives for enhancing the light-fastness of dyed multicomponent fibres composed of a thermodynamically compatible polyolefin and polyamide.

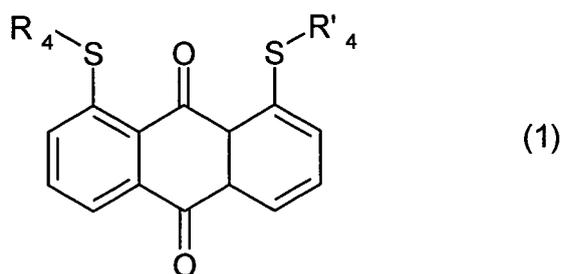
50 **Patentansprüche**

1. Verfahren zum Verbessern der Lichtechtheit von Färbungen von Multikomponentenfasern aus einer thermodynamisch kompatiblen Mischung aus Polyolefin und Polyamid mit Dispersionsfarbstoffen **dadurch gekennzeichnet, dass** sie einer Behandlung mit Benzotriazolderivaten unterzogen werden.
- 55 2. Verfahren nach Anspruch 1 **dadurch gekennzeichnet, dass** die Benzotriazolderivate Benzotriazolderivate der Formel (I)



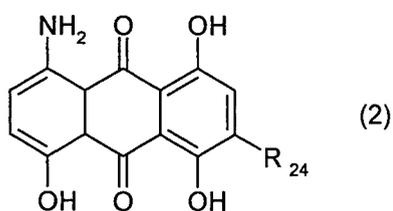
10 sind, wobei
 R₁ ein Halogenatom,
 R₂ ein C₁ bis C₆ Alkyl und
 R₃ ein C₁ bis C₆ Alkyl bedeutet.

- 15
3. Verfahren nach Anspruch 1 **dadurch gekennzeichnet, dass** die Multikomponentenfasern aus einer thermodynamisch kompatiblen Mischung aus Polyolefin und Polamid, insbesondere aus Polypropylen, modifiziertes PA und Polyamid, und bevorzugterweise mit polyfibrillen Charakter besitzt.
- 20
4. Verfahren nach Anspruch 1 **dadurch gekennzeichnet, dass** die Multikomponentenfasern aus einem Kern eines ersten Polymers, welches bevorzugterweise das Polyamid ist, besteht und dass dieser Kern durch ein zweites Polymer, welches bevorzugterweise das Polyolefin ist, ummantelt ist, bestehen.
- 25
5. Verfahren nach Anspruch 1 **dadurch gekennzeichnet, dass** das Benzotriazolderivat in einer Menge von 0,01 bis 20 Gewichtsprozent bezogen auf die trockene Ware verwendet wird.
6. Verfahren nach Anspruch 1 **dadurch gekennzeichnet, dass** die Dispersionsfarbstoffen mit den Formeln (1)

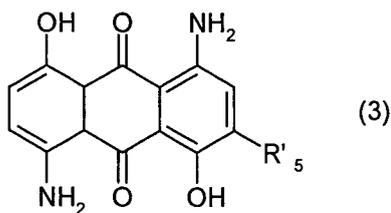


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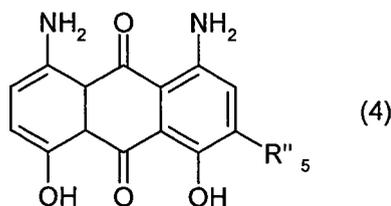
40 worin R₄ und R'₄ unabhängig voneinander eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe bedeuten. oder mit den Formeln (2), (3) oder (4)



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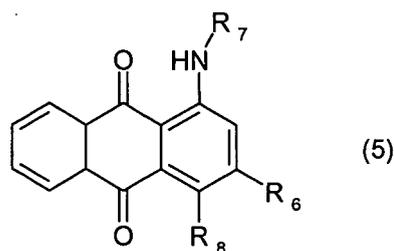
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20 worin R_5 , R'_5 , und R''_5 unabhängig voneinander Halogen , insbesondere -Cl oder -Br, eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe bedeuten,
oder mit den Formeln (5)

25



30

35

worin

40

R_6 Halogen , insbesondere -Cl oder -Br, eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe oder Phenoxygruppe oder durch eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenoxygruppe,

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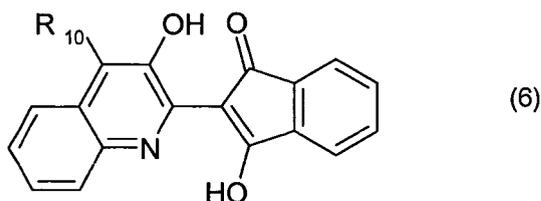
R_7 eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe,

R_8 -NH₂ oder -NHR₉, worin R_9 durch Halogen , insbesondere -Cl oder -Br, eine Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe oder Phenoxygruppe, oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe oder Phenoxygruppe, oder R_9 bedeutet eine Gruppe der Formel SO₂-Phenyl, wobei die Phenylgruppe der SO₂- Phenylgruppe nicht substituiert ist oder eine durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe oder durch Halogen, insbesondere -Cl oder -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ oder -OH substituierte Phenylgruppe bedeutet,

50

bedeuten,
oder mit den Formeln (6)

55



10

worin

R_{10} -H oder Halogen, insbesondere -H, -Cl oder Br bedeuten.

15

7. Lichtechte, gefärbte Multikomponentenfasern aus einer thermodynamisch kompatiblen Mischung aus Polyolefin und Polyamid gefärbt mit Dispersionsfarbstoffen **dadurch gekennzeichnet, dass** sie einer Behandlung mit Benzotriazolderivaten unterzogen worden sind.

20

8. Verwendung von lichtechten, gefärbte Multikomponentenfasern gemäss Anspruch 7 zur Herstellung von Teppichen und/oder textilen Bodenbelägen

9. Verwendung von Benzotriazolderivaten zur Erhöhung der Lichtechtheit von gefärbten Multikomponentenfasern aus einer thermodynamisch kompatiblen Mischung aus Polyolefin und Polyamid.

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Revendications

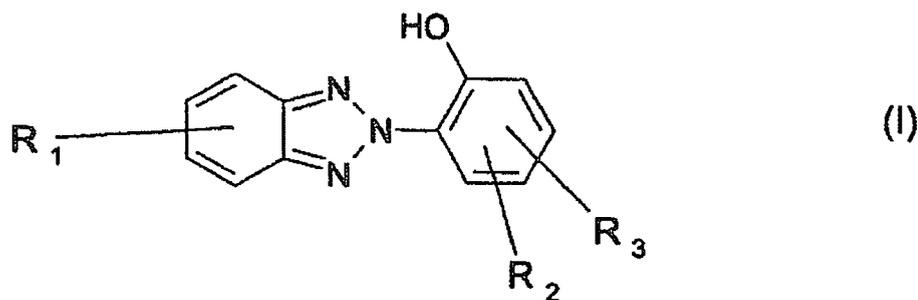
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1. Procédé pour améliorer la résistance à la lumière de colorations sur des fibres multicomposants composées d'une polyoléfine et d'un polyamide thermodynamiquement compatibles, avec des colorants dispersables, **caractérisé en ce que** les fibres multicomposants sont soumises à un traitement avec des dérivés de benzotriazole.

35

2. Procédé selon la revendication 1, **caractérisé en ce que** les dérivés de benzotriazole sont des dérivés de benzotriazole de formule (I)

40



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dans laquelle

R_1 est un atome d'halogène,

50

R_2 est un alkyle en C_1 à C_6 , et

R_3 est un alkyle en C_1 à C_6 .

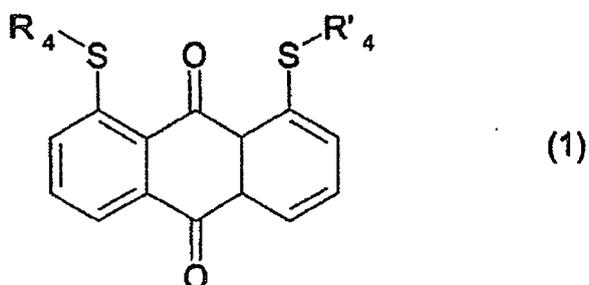
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3. Procédé selon la revendication 1, **caractérisé en ce que** les fibres multicomposants sont constituées d'une polyoléfine et d'un polyamide thermodynamiquement compatibles, en particulier de polypropylène, de PA modifié et de polyamide, et de préférence ayant un caractère multifilamentaire.

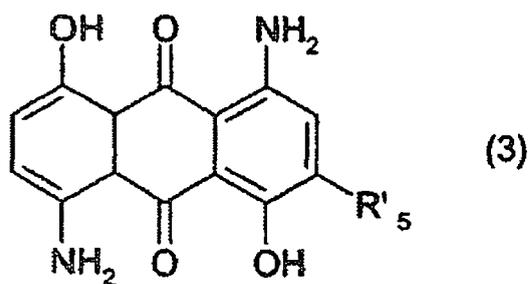
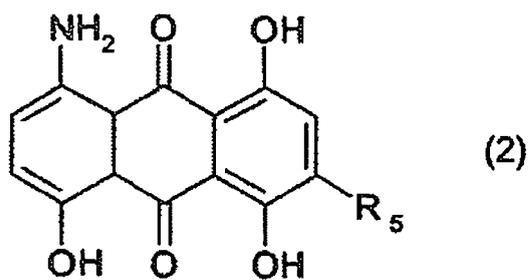
4. Procédé selon la revendication 1, **caractérisé en ce que** les fibres multicomposants sont constituées d'un coeur d'un premier polymère, qui de préférence est le polyamide, et **en ce que** ce coeur est recouvert d'un deuxième

polymère, qui est de préférence la polyoléfine.

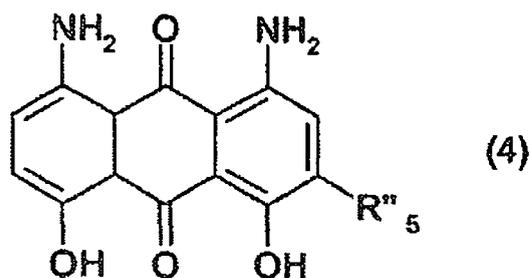
5. Procédé selon la revendication 1, **caractérisé en ce que** le dérivé de benzotriazole est utilisé dans une quantité de 0,01 à 20 pour cent en poids sur la base de la matière sèche.
6. Procédé selon la revendication 1, **caractérisé en ce que** les colorants dispersables ont la formule (1)



20 dans laquelle R_4 et R'_4 sont indépendamment un groupement phényle ou un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou les formules (2), (3) ou (4)



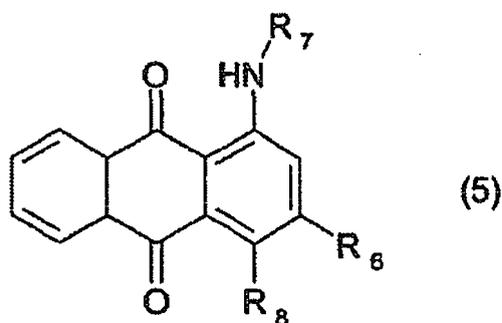
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15 dans lesquelles R_5 , R'_5 et R''_5 sont indépendamment halogène, en particulier -Cl ou -Br, un groupement phényle ou un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou ont la formule (5)

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dans laquelle

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R_6 est halogène, en particulier -Cl ou -Br, un groupement phényle ou un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou un groupement phényle ou un groupement phénoxy substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH,

40

R_7 est un groupement phényle ou un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH,

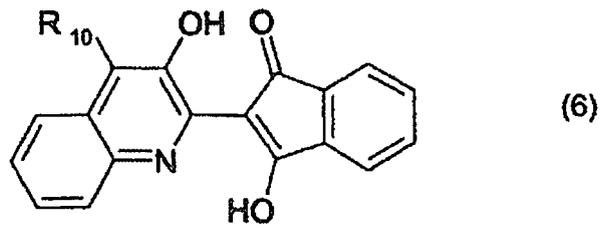
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R_8 est -NH₂ ou -NHR₉, où R_9 est halogène, en particulier -Cl ou -Br, un groupement phényle ou un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou un groupement phényle ou un groupement phénoxy substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou R_9 est un groupement de formule SO₂ phényle, où le groupement phényle du groupement SO₂-phényle n'est pas substitué, ou est un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH, ou est un groupement phényle substitué par halogène, en particulier -Cl ou -Br, -CH₃, -CH₂CH₃, -OCH₃, -OCH₂CH₃ ou -OH,

50

ou ont la formule (6)

55



dans laquelle

15 R_{10} est -H ou halogène, en particulier -H, -Cl ou Br.

- 20
7. Fibres multicomposants colorées résistantes à la lumière, composées d'une polyoléfine et d'un polyamide thermodynamiquement compatibles, colorées avec des colorants dispersables, **caractérisées en ce qu'elles** ont été soumises à un traitement avec des dérivés de benzotriazole.
 8. Utilisation de fibres multicomposants colorées résistantes à la lumière selon la revendication 7, pour produire des moquettes et/ou des revêtements de sol en textile.
 9. Utilisation de dérivés de benzotriazole pour augmenter la résistance à la lumière de fibres multicomposants colorées composées d'une polyoléfine et d'un polyamide thermodynamiquement compatibles.
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REFERENCES CITED IN THE DESCRIPTION

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