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3,695,924

PROCESS FOR TEXTILE TREATMENT AND TREATED TEXTILE

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9 Claims

ABSTRACT OF THE DISCLOSURE

A composition, suitable for use in treating textiles, which comprises a stable water emulsion of a polyurethane-polyurea polymer. The composition may be formed by emulsifying a pre-polymer containing at least two free NCO groups in water and effecting reaction of the NCO groups with the water. This composition is desirably used in combination with a crosslinking resin, such as a melamine formaldehyde resin, to treat textile materials, and particularly cellulosic textiles, to impart wash and wear and durable press characteristics thereto. The abrasion resistance of the treated textile material is found to be appreciably greater than that of similar materials treated only with the crosslinking resin.

This is a divisional application of Ser. No. 692,322 filed Dec. 21, 1967, now abandoned.

This invention relates to a composition and process for the treatment of textile materials and more particularly it relates to the treatment of textile materials to produce an abrasion resistant material having wash and wear and durable press characteristics.

In recent years, it has been the practice to treat fabrics with various thermal setting resins to impart to the fabrics wash and wear and durable press characteristics. These processes have been directed to the treatment of the fabrics both in the form of yard goods and as finished articles and have included the polymerization or setting of the resin both before and after the desired creases have been imparted to the fabric. While such processes have, in general, been satisfactory from the standpoint of imparting the desired wash and wear and durable press characteristics to the fabric, the treated fabric has frequently suffered from a loss of resistance to abrasion. Although numerous attempts have been made to overcome this problem, and improve the abrasion resistance of the thus-treated fabrics, up to the present time, none of these attempts have been completely successful.

It is, therefore, an object of the present invention to provide a composition suitable for the treatment of textile materials to provide the treated materials with wash and wear and durable press characteristics without excessive loss of abrasion resistance.

A further object of the present invention is to provide an improved process for treating textile materials to impart thereto improved wash and wear and durable press characteristics without excessive reduction of abrasion resistance.

These and other objects will become apparent to those

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skilled in the art from the description of the invention which follows.

Pursuant to the above objects, the present invention includes a composition suitable for use in treating textile materials to impart wash and wear and durable press characteristics thereto, which composition comprises a stable, water emulsion of a polyurethane-polyurea polymer. This composition may be applied to textile materials in conjunction with conventional cross-linking resins to impart wash and wear and durable press characteristics to the textile material without appreciably reducing the abrasion resistance characteristics of the material.

More specifically, in the practice of the present invention, the stable water emulsion of the polyurethane-polyurea polymer may be prepared by emulsifying a pre-polymer which contains at least two free NCO groups per mole in water and reacting the NCO groups of the emulsified prepolymer with water. In formulating the emulsion, an organic solvent solution of the pre-polymer may be prepared which contains a suitable emulsifying agent. Thereafter, this solution may be admixed with water, which also contains a suitable emulsifying agent, and the resulting admixture is aged for a period sufficient to effect the desired reaction of the NCO groups of the prepolymer with the water. The resulting polyurethane-polyurea polymer is formed as an extremely stable water emulsion in which the polymer, typically, has a particle size of less than about two microns. Although, from the standpoint of stability of the emulsion, it is desirable that the polymer particle size is as small as possible, where the emulsion stability is not of prime importance, the particle size of the polyurethane-polyurea polymer may be appreciably greater than the typical particle size indicated, e.g., as great as one millimeter.

The pre-polymer which is used to form the stable emulsion of the present invention may be any various polymerizable materials which contain at least two free NCO groups per molecule. Suitable prepolymer materials containing at least two free NCO groups per mole include various diisocyanates and polyisocyanates, i.e., isocyanates containing more than two free NCO groups per mole. Typical of materials which may be used are ethylene diisocyanate, propylene diisocyanate, butylene diisocyanate, trimethylene diisocyanate, tetramethylene diisocyanate, hexamethylene diisocyanate, octamethylene diisocyanate, decamethylene diisocyanate, cyclohexylene diisocyanate, bis(2-isocyanatoethyl) ether, bis(2-isocyanatoethyl) ether of ethylene glycol, orthophenylene diisocyanate, meta-phenylene diisocyanate, para-phenylene diisocyanate, toluene-2,4-diisocyanate, toluene-2,6-diisocyanate, 3,3'-bitoluene-4,4'-diisocyanate, diphenylether-4,4'-diisocyanate, 3,5,3',5'-bixylylene-4,4'-diisocyanate, diphenylmethane-4,4'-diisocyanate, biphenylene diisocyanate, 3,3'-dimethoxybiphenylene-4,4'-diisocyanate, naphthalene diisocyanates, and the like.

Additional prepolymer materials which may be used include the various polyisocyanates and urethane-polyisocyanates. The polyisocyanates may be of the polymethylene polyphenyl type while the urethane polyisocyanates which may be used include those prepared by the reaction of a polyhydroxy compound and diisocyanate and may also contain tertiary nitrogen, in an amount of at least

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0.05% by weight. Additionally, the urethane polyisocyanates may be the reaction product of any of these isocyanate materials and a diol.

Exemplary of suitable polyisocyanates are polyaryl polyisocyanates containing at least three aryl groups and having an average of at least three isocyanate groups per mole. A portion of these isocyanate groups may be modified by reaction with an alcohol, a thiol alcohol, an organic acid, an amine, an amide, or the like. Polyisocyanates of this type are described in detail in copending application Ser. No. 510,028, filed Nov. 26, 1965, now U.S. Pat. 3,552,910 issued Jan. 5, 1971 which application is hereby incorporated into the present disclosure.

Typical of the urethane-polyisocyanates which may be used are polyhydroxy modified isocyanates which contain up to 4.5 OH groups, from 1.5 to 6 free NCO groups, wherein the total of OH and NCO groups is from 3 to 6. Urethane polyisocyanates of this type are described in detail in copending application Ser. No. 510,102, filed Nov. 26, 1965, now abandoned and refiled as Ser. No. 814,846 Apr. 9, 1969, in turn abandoned and refiled as Ser. No. 110,603, Jan. 28, 1971, which application is hereby incorporated in the present disclosure.

Typical of the tertiary nitrogen containing isocyanate prepolymers which may be used are urethane polyisocyanates of the above type which also contain at least about 0.05% of tertiary nitrogen. Such materials may be reacted by preparing a polyhydroxy-compound containing from 3 to 6 hydroxy groups with a diisocyanate, wherein from 1 to 100% of the polyhydroxy compound is a tertiary nitrogenous polyol or by reacting a tertiary nitrogenous hydroxy compound containing from 1 to 6 OH groups with a polyisocyanate or urethane polyisocyanate containing from 2 to 6 isocyanate groups. Compounds of this type are described in detail in copending application Ser. No. 619,066, filed February 1967, now abandoned and refiled as Ser. No. 114,716, Feb. 11, 1971, which application is hereby incorporated in the present disclosure.

Additionally, the prepolymer composition may be a reaction product of a diol and any of the above-indicated isocyanate materials, including those containing tertiary nitrogen. Typically, the diol may be a dihydroxy alkane containing 2 to 12 carbon atoms; an alkylene diol containing 2 to 12 carbon atoms; polyester diols having a molecular weight of from about 200 to 10,000; polyurethane diols having an average molecular weight of about 200 to 10,000; polyether diols having a molecular weight of about 62 to 10,000, and the like. Compounds of this type are specifically described in copending application Ser. No. 622,465, filed Mar. 13, 1967, now abandoned and refiled as Ser. No. 11,900, Feb. 16, 1970, now U.S. Pat. 3,650,806, issued Mar. 21, 1972, which application is hereby incorporated in the present disclosure.

Of the above, the preferred prepolymer materials are the nitrogen containing urethane polyisocyanates, such as the reaction product of a diisocyanate and a polymeric ditertiary nitrogen containing tetrol. Accordingly, hereinafter, specific reference will be made to materials of this type being the preferred prepolymer for use in the method of the present invention. This is not, however, to be taken as a limitation on the present invention, but merely as being exemplary of specifically preferred prepolymer materials which may be used.

The stable water emulsion of the prepolymer material may be formulated by emulsifying an organic solvent solution of the prepolymer with water, using a suitable non-ionic surface active or emulsifying agent. The prepolymer may be dissolved in any suitable solvent, which will not adversely affect the prepolymer, although aromatic organic solvents such as benzene, toluene, xylene and the like, and halogenated aliphatic solvents, such as trichloroethylene, perchloroethylene, carbon tetrachloride, methylene chloride, methyl chloroform, and the like, are preferred. These organic solvents may be described generally, as benzene, substituted benzenes containing from

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about one to six carbon atoms each and halogenated lower alkyls containing from about 1 to 6 carbon atoms and from about 1 to 8 halogen atoms. The prepolymer material is dissolved in the solvent in an amount from about 10% up to the maximum solubility of the prepolymer in the particular solvent used. Preferably, the amount of prepolymer dissolved in the solvent is within the range of about 50 to 75% by weight. Thereafter, a suitable non-ionic emulsifying agent is added to the solvent solution of the prepolymer, desirably in an amount within the range of about 2 to 10% by weight of the organic solvent solution, with amounts within the range of about 4 to 6% by weight being preferred.

Water, also containing a suitable non-ionic emulsifying agent, desirably in an amount within the range of about 5 to 15% by weight of the water and preferably in an amount within the range of about 8 to 12% by weight, is then combined and thoroughly admixed with the organic solvent solution of the prepolymer. Desirably the amount of water admixed with the organic solvent solution of the prepolymer is within the range of about 70 to 130% by weight of the organic solvent solution, with amounts within the range of about 90 to 110% by weight being preferred. The non-ionic emulsifying agent admixed with the water may be the same as that incorporated in the organic solvent solution of the prepolymer or, if desired, may be a different non-ionic emulsifying agent. In many instances it has been found to be preferable if the non-ionic emulsifier used in the prepolymer solution is one having more affinity for the non-aqueous or "oil" phase of the emulsion, while the emulsifier used in the water is one having more affinity for the aqueous phase of the emulsion.

The non-ionic emulsifying agents which may be used are of various types, as are known to those in the art. Typical of the types of non-ionic emulsifying agents which may be utilized are polyoxyethylene alkyl phenols, ditertiary acetylenic glycols, polyethylene glycol alkyl thioethers, fatty acid esters of polyglycols, alkyl aryl polyether alcohols, alkyl arylpolyether sulfonates, alkyl arylpolyether sulfates, and the like. Particularly preferred non-ionic emulsifying agents for use in the present invention are the polyoxyethylene ether of monophenol and the octylphenoxypolyethoxy ethanol. These materials, however, are merely exemplary of those which may be used and are not to be taken as a limitation on the present invention.

The organic solvent solution of the prepolymer is formed into the desired water emulsion by admixing the prepolymer solution, which contains the non-ionic emulsifying agent as indicated hereinabove, with water which also contains a non-ionic emulsifying agent, desirably in the amounts indicated. Preferably, the amount of water admixed with the prepolymer solution will be such as to provide a water emulsion which contains from about 10 to 35% by weight of the prepolymer and preferably contains the prepolymer in an amount within the range of about 20 to 30% by weight. Such emulsion desirably contains the emulsifying agents in an amount within the range of about 2 to 20% by weight and the water in an amount within the range of about 30 to 75% by weight. The mixing of the water and the prepolymer solution may be carried out in any convenient manner which will achieve the desired admixing of these components. Typically, these techniques will involve mixing, agitation, shearing, blending and the like.

Once the emulsification of the prepolymer solution in water has been achieved, the free NCO groups are reacted with the water of the emulsion, to form the emulsified polyurethanepolyurea composition. The time to effect this reaction will vary, depending upon the conditions under which the reaction is carried out, particularly the reaction temperature. Thus, where the water emulsion is merely permitted to age at substantially room temperature, several days, e.g., 5 to 10 days, may be neces-

sary to substantially complete the reaction of the free NCO groups with the water. Where elevated temperatures are used, however, temperatures of about 75° C. being typical, the reaction may be carried out to the desired extent in a few hours, e.g. 4 to 8 hours. Desirably, the reaction is carried out for a period of from 5 to 125 hours at a temperature of from 20 to 80° C. Once the desired reaction in the water has been completed, the resulting product is an extremely stable water emulsion of a polyurethane-polyurea polymer which, typically, has a particle size of less than about 2 microns.

The thus-prepared water emulsion of the polyurethane-polyurea is applied to a textile material, in conjunction with a conventional water-soluble thermosetting crosslinking resin. Although these materials may be applied sequentially, i.e., the polyurethane-polyurea emulsion being applied first and dried on the fabric, followed by the application of the thermosetting resin system, the two resin systems are preferably admixed and applied at the same time.

In this preferred application method, i.e., where the polyurethane-polyurea emulsion and the crosslinking resin are applied simultaneously, a treating solution is formulated which contains both of these materials. Desirably, this is an aqueous treating solution which contains from about 5 to 30% by weight of the polyurethane-polyurea emulsion and about 5 to 20% solids by weight of the thermo setting crosslinking resin. Preferably, in this treating solution, the polyurethane-polyurea emulsion is present in an amount within the range of about 10 to 20% by weight and the crosslinking resin is present in an amount within the range of about 8 to 12% solids by weight. It is to be appreciated, of course, that amounts of these components outside of the preferred ranges which have been indicated may also be used, provided sufficient of the treating materials are present to obtain the desired abrasion resistance, wash and wear properties and provided the maximum solubility of the components in the aqueous solution is not surpassed. Additionally, if desired, a catalyst for the crosslinking resin may also be included in the treating solution, which catalysts are typically present in amounts within the range of about 1 to 5% by weight of the solution.

The textile material to be treated may be impregnated with the above treating solution in any convenient manner. For example, the materials may be immersed or padded through the treating solution and the fabric then passed through squeeze rolls to remove excess solution. If desired, however, the treating solution may be applied by spraying, rather than by immersion. Other suitable application techniques, as are known to those in the art, may also be used. Desirably, the impregnation is carried out so that the treated material has a total resin add-on within the range of about 3 to 12% by weight of the textile material. Higher resin add-ons, e.g., 20% by weight, may be attained in some instances although, generally, it has not been found that such higher add-ons appreciably improve the wash and wear and durable press properties obtained. The relative amounts of the polyurethane-polyurea polymer and the thermal setting cross-linking resin in the treating solutions are selected and the impregnation is carried out so that the resin add-on of the polyurethane-polyurea material is desirably from about 1 to 8% by weight and preferably from about 2 to 6% by weight of the material while the resin add-on of the crosslinking resin is desirably from about 6 to 10 percent by weight and preferably from about 7 to 8% by weight of the treated material.

Typically, during the impregnation of the textile material, the treating solution is at a temperature within the range of about 20 to 40 degrees centigrade, with temperatures within the range of 25 to 30 degrees centigrade being preferred. Following the impregnation, the textile material may be dried, temperatures within the range of about 100 to 150 degrees centigrade being typical, and

thereafter, the treated material is then heat cured, curing temperatures within the range of about 150 to 200 degrees centigrade for a period of from about 1 to 15 minutes, being typical. In some instances, the drying and curing of the impregnated textile material may be carried out simultaneously. In the case of textile materials in the form of finished articles to which creases have been imparted which are to be retained in the article, the drying and curing are desirably carried out as separate steps.

Where the polyurethane-polyurea emulsion and the crosslinking resins are not applied simultaneously, the aqueous emulsion of the polyurethane-polyurea polymer is first applied to the textile material to provide a resin add-on of this material as has been described hereinabove. The treated textile is then dried and the thus-dried material is then impregnated with an aqueous solution of the crosslinking resin. For such application, the emulsion system of the polyurethane-polyurea material desirably contains the polyurethane-polyurea polymer in the amount within the range of about 5 to 30 percent by weight and preferably in an amount within the range of about 10 to 20% by weight. Similarly, the aqueous solution of the crosslinking resin desirably contains this material in an amount within the range of about 5 to 20% solids by weight and preferably in an amount within the range of about 8 to 12 percent solids by weight. As with the simultaneous application of the polyurethane-polyurea polymer crosslinking resin, the crosslinking resin treating solution may also contain a suitable catalyst, which material is typically present in amounts within the range of about 1 to 5 percent by weight of the treating solution.

It is to be appreciated that various water-soluble thermosetting crosslinking resins, as are known to those in the art, may be used. Typical of such resins are the N-methylol resins including ureas, cyclic ureas, melamines, urea formaldehydes, methalated methylol melamines, melamine formaldehydes, and the like. Resins of this type and their application to textile materials to impart wash and wear and durable press characteristics are described in U.S. Patents 2,974,432 and 3,263,915.

Various textile materials may be treated utilizing the compositions and processes of the present invention, as are known to those in the art. The present invention is particularly applicable, however, in the treatment of cellulosic textile materials, such as cottons, rayons, and the like. In the treatment of these materials, the compositions and processes of the present invention result in the production of a textile having durable wash and wear and durable press characteristics. Additionally, the treated fabrics are found to have greatly improved abrasion resistance as compared to similar materials which are treated only with the crosslinking resins. It is to be appreciated, of course, that the textile materials may be treated in various forms, including yard goods as well as finished articles, such as shirts, coats, trousers, slacks, and the like. Where finished articles are treated, any creases which are to be retained in the garment are desirably imparted thereto prior to the time the final cure of the resin impregnants is effected, as has been indicated above.

In order that those skilled in the art may better understand the present invention and the manner in which it may be practiced, the following specific examples are given. In these examples, unless otherwise indicated, temperatures are in degrees centigrade and parts and percents are by weight. It is to be appreciated, however, that these examples are merely exemplary of the present invention and the manner in which it may be practiced and are not to be taken as a limitation thereof.

EXAMPLE 1

A prepolymer was formed by reacting one mole of an oxypropylated ethylene diamine having a molecular weight of 5000 with 4 moles of toluene diisocyanate for two hours at 80 degrees centigrade in trichloroethylene, to form a prepolymer solution in trichloroethylene, containing 50

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percent by weight solids. To 100 parts by weight of this prepolymer solution was added 5 parts by weight of a non-ionic emulsifying agent (polyoxyethylene ether of nonylphenol) and this was admixed with 85 parts by weight of water to which has been added 10 parts by weight of a non-ionic emulsifying agent (octylphenoxypolyethoxy ethanol). After a thorough admixing, the resulting emulsion was aged for five days at room temperature to effect reaction of the NCO groups of the prepolymer with the water.

A pad bath was formed from the resulting polyurethane-polyurea emulsion containing the following components in the amounts indicated:

Components:	Parts by weight
Dihydroxy-N,N'-dimethylolethylene urea (45% aqueous solution)	22
Zinc nitrate	2.0
Polyethylene fabric softener (25% by weight aqueous solution)	2.0
Polyurethane - polyurea emulsion (containing 25% by weight solid)	16.0
Water	57.8

The pad bath was maintained at a temperature of 25 degrees centigrade and an 8 ounce cotton twill was padded through the bath and passed through squeeze rolls to effect a wet pickup on the fabric of 65% by weight. The treated fabric was then dried for two minutes at about 120 degrees centigrade and then was cured for five minutes at 160 degrees centigrade. The treated fabric was then tested for wrinkle recovery, abrasion resistance, tensile strength and tear strength, both initially and after being subjected to 20 home laundryings. Using this procedure the following results were obtained:

	Initial	After 20 home washes
Wrinkle recovery, W+F (in degrees)	295	275
Tabor abrasion (grams of fabric lost)	0.08	0.07
Tensile strength, salt, fill (pounds)	36	36
Tear strength, Elmendorf (grams)	750	800

EXAMPLE 2

The isocyanate prepolymer and polyurethane-polyurea polymer emulsion were prepared as in Example 1. Additionally, there was prepared a second treating solution which was an aqueous solution containing 10 percent of dihydroxyl-N,N'-dimethylolethylene urea and 2 percent of zinc nitrate catalyst. Samples of undyed 8 ounce cotton twill fabric was padded through the treating solution to impregnate the fabric. Some of the fabric samples were treated only with the polyurethane-polyurea emulsion, others were treated only with the crosslinking resin solution while still others were treated with both materials. After impregnation, the samples which had been treated with only one of the treating solutions were cured by heating for 10 minutes at 160 degrees centigrade. The samples which were treated with both treating solutions were dried for two minutes at 120 degrees centigrade after treatment with the polyurethane-polyurea emulsion and were then cured by heating for five minutes at 160 degrees centigrade after treatment with the crosslinking solution. The thus-treated samples were then tested for wrinkle recovery, abrasion resistance, tensile strength, and tear strength, both initially and after being subjected to 25 washes. Using this procedure, the following results

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were obtained, with weights of applied material based on the weight of fabric:

	5.3		3.0		-----
Percent dihydroxy-N,N'-dimethyl ethylene urea applied.....	5.3		3.0		-----
Percent polyurethane-polymer emulsion (25% solids) applied.....	-----		12		12
	After 25 initial washes		After 25 initial washes		Initial
10 Wrinkle recovery W+F (Warp+Fill) (in degrees)	280	260	280	268	210
Tabor abrasion (grams of fabric lost)	0.09	0.112	0.06	0.05	0.04
Tensile strength, Scott, fill (in pounds)	38	34	45	43	58
Tear strength, Elmendorf, fill (in grams)	710	600	1,000	825	1,400

EXAMPLE 3

An isocyanate prepolymer and polyurethane-polyurea polymer emulsion were prepared as in Example 1. A pad bath was prepared containing the following components in the amounts indicated:

Components:	Pounds
Dihydroxy-N,N'-dimethylolethylene urea (45% aqueous solution)	75
Zinc nitrate	20
Polyurethane-polyurea emulsion (25% solids)	37
Polyethylene fabric softener (25% aqueous solution)	4
Non-ionic emulsifier	0.25

To this composition was added sufficient water to make 25 gallons of treating solution. Rayon fabric was then padded through this treating composition to obtain a wet pickup on the fabric of about 65 percent by weight. The treated fabric was then dried for 2 minutes at 140 degrees centigrade and then cured for 10 minutes at 170 degrees centigrade. The treated fabric was then tested as in the previous examples and the following results were obtained:

40 Wash and wear rating (after 5 home washes) ..	4.0
Shrinkage after 5 home washes W×F (warp×fill), in percent	1.2×1.0
Abrasion, Stoll flat (cycles to failure)	85
Tensile strength, Scott fill (in pounds)	65

45 Similar tests were run on an untreated sample and on a sample treated with a similar treating solution but which did not contain the polyurethane-polyurea emulsion and the following results were obtained:

	Untreated	Without polyurethane-polymer emulsion
55 Wash and wear	1.0	3.5
Shrinkage	8.5×5.5	1.2×1.0
Abrasion	150	10
Tensile strength	90	55

60 It is to be noted that the wash and wear rating is based on a scale of 1 to 5, wherein 1 represents the lowest or worst and 5 represents the highest or best rating.

65 While there have been described various embodiments of the invention, the compositions and methods described are not intended to be understood as limiting the scope of the invention as changes therewithin are possible and it is intended that each element recited in any of the following claims is to be understood as referring to all equivalent elements for accomplishing the same results in substantially the same or equivalent manner, it being intended to cover the invention broadly in whatever form

70 its principle may be utilized.

What is claimed is:

75 1. A method of treating textile materials to impart thereto abrasion resistance, wash and wear and durable press characteristics which comprises impregnating the textile material to be treated with a first treating com-

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position consisting essentially of a water emulsion of a stable polyurethane-polyurea polymer, drying the thus-impregnated textile material, impregnating the thus-dry material with a second aqueous treating composition consisting essentially of water and a water-soluble thermosetting crosslinking resin and, thereafter, curing the thus-treated textile material.

2. The method as claimed in claim 1 wherein the polyurethane-polyurea polymer is present in the first treating composition in an amount within the range of about 5 to about 30 percent by weight and the crosslinking resin is present in the second treating composition in an amount within the range of about 5 to about 20 percent by weight.

3. The method as claimed in claim 2 wherein the crosslinking resin is dihydroxyl-N,N'-dimethylolethylurea.

4. A method for treating textile materials to impart abrasion resistance, wash and wear and durable press characteristics thereto which comprises impregnating the textile materials to be treated with a stable, water emulsion of a polyurethane-polyurea polymer and a water-soluble thermosetting crosslinking resin, to deposit on said textile material at least about 1 percent by weight polyurethane-polyurea polymer and at least about 2 percent by weight crosslinking resin, based on the weight of said textile material, and, thereafter, curing the thus-treated textile material.

5. A method as claimed in claim 4 wherein stable, water emulsion contains at least about 5 percent by weight polyurethane-polyurea polymer and at least about 5 percent by weight crosslinking resin, based on the weight of the emulsion.

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6. The method as claimed in claim 5 wherein the crosslinking resin is present in an amount of from about 5 to about 20 percent by weight, based on the emulsion weight.

7. A method as claimed in claim 6 wherein the thermosetting cross-linking resin is dihydroxyl-N,N'-dimethylolethylurea.

8. A textile material impregnated with at least about 1 percent by weight of a polyurethane-polyurea polymer and at least about 2 percent by weight of a thermosetting, cross-linking resin, based on the weight of the textile material.

9. A textile material as claimed by claim 8 wherein the crosslinking resin is dihydroxyl-N,N'-dimethylolethylurea.

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