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TREATING FIBROUS MATERIALS WITH ALKALINE LIQUIDS OF MERCERIZING STRENGTH

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My present invention relates to a process of increasing the wetting action of strongly alkaline liquids such as used, for instance, in the mercerization of cotton.

Another object of my invention is the treatment baths produced. It is an object of my invention to so modify the treating bath of the textile fiber as to accelerate the time of wetting of the fiber by the alkaline liquids and to render the penetration of the latter into the former more uniform and more intense.

It has already been suggested to add special assistants to mercerizing lyes which are applied in the textile industry for the purpose of raising their wetting capacity and penetrating velocity. As such assistants I enumerate: soaps, Turkey red oils, sulfonated fats, aromatic sulfonic acids, as well as phenols and its homologous compounds with or without addition of special solvents such as aliphatic or aromatic alcohols. Because of the tendency to be salted out on account of the high electrolyte content of the mercerizing lye, some of these agents are either usable for a short time only or not practical at all. Some of the solvents are volatized in a short time or are only difficultly soluble in the lye and become aggregated into drops which float on top of the bath, adhere on the fiber and interfere with the uniform impregnation of the fibrous material with the lye.

Now I have found that all these disadvantages are avoided when using as a wetting assistant in mercerizing lyes a mixture of phenols or halogenophenols or of aliphatic sulfonic acids with aromatic or aliphatic sulfamides.

As such sulfamides I enumerate, for instance:—benzenesulfopropylamide, benzenesulfobutylamide, benzenesulfohydroxybutylamide, ortho-, meta- or para-toluenesulfobutylamide, toluenesulfohydroxybutylamide, butansulfobutylamide, butansulfohydroxybutylamide, butansulfohydroxypropylamine, pentansulfopropylamide, hexansulfoisobutylamide, etc. The sulfamides in question are obtainable by condensing the corresponding aliphatic or aromatic sulfochlorides with the amines or hydroxyamines in question.

These sulfamides contrary to other assistants, dissolve as alkali metal salts in the mercerizing lyes and cause in this form in combination with the phenols the desired intense and uniform penetration of the lye.

As may be seen from the table following hereafter, only very small amounts of the said sulfamides are to be added together with phenols to the mercerizing baths in order to obtain the desired effect. Their action may be combined with other well known wetting agents. In some cases it may be preferred to add an organic solvent in order to avoid the formation of foam; these solvents, however, have no effect on the wetting capacity of my assistants.

In the table following hereafter, the wetting capacity of some of my new assistants for mercerizing cotton may be seen. The wetting capacity of the different products is indicated in this table by the shrinkage of a crude cotton yarn that is immersed into a mercerizing lye of 30° Bé. at about 20° C. for 5 seconds with a tension corresponding to 10 grams per four threads. The shrinkage observed after 10, 20, and 30 seconds, is indicated in percentage of the original length of the threads. For comparison, the action of a mixture of cresol and xylenol, likewise, is indicated in this table.

Wetting agent	Amounts added to the mercerizing lye	Shrinkage after 10 sec.	20 sec.	30 sec.
(1) 50 parts of crude cresol, 50 parts of xylenol (for comparison)	10 g/l	4.5	17.5	21
Do	5 g/l	0.8	3.0	7.0
Do	2.5 g/l	0.2	1.2	2.5
(2) 47 parts of crude cresol, 47 parts of xylenol, 6 parts of p-toluenesulfobutylamide	10 g/l	14.0	21.5	23.5
Do	5 g/l	6.0	16.0	21.5
Do	2.5 g/l	1.5	5.0	8.5
(3) Chlorxylenol (for comparison)	10 g/l	13.0	17.0	20.0
Do	5 g/l	6.0	14.5	19.0
Do	2.5 g/l	0.6	2.5	5.5
(4) 98 parts of chlorxylenol, 2 parts of toluene-sulfobutylamide	10 g/l	15.0	21.5	22.5
Do	5 g/l	10.0	19.5	22.5
Do	2.5 g/l	3.0	8.0	11.8
(5) 98 parts of chlorxylenol, 2 parts of butansulfobutylamide	10 g/l	15.0	21.0	22.0
Do	5 g/l	10.5	19.5	21.8
Do	2.5 g/l	2.5	7.8	12.0

What I claim is:—

1. In the process of treating fibrous material with alkaline liquids of mercerizing strength the step which comprises effecting this treatment in the presence of a phenol and of an organic sulfamide of the general formula R—SO_2NH—A, wherein R is a hydrocarbon radicle of the group consisting of radicles of the benzene series and of the aliphatic series containing up to 6 carbon atoms and A is a member of the group consisting of alkyl and hydroxyalkyl.

2. In the process of treating fibrous material with alkaline liquids of mercerizing strength the step which comprises effecting this treatment in the presence of a mixture of cresols and xylenols

and of an organic sulfamide of the general formula $R—SO_2NH—A$, wherein R is a hydrocarbon radicle of the group consisting of radicles of the benzene series and of the aliphatic series containing up to 6 carbon atoms and A is a member of the group consisting of alkyl and hydroxyalkyl.

3. In the process of treating fibrous material with alkaline liquids of mercerizing strength the step which comprises effecting this treatment in the presence of chlorxylenol and of an organic sulfamide of the general formula $R—SO_2NH—A$, wherein R is a hydrocarbon radicle of the group consisting of radicles of the benzene series and of the aliphatic series containing up to 6 carbon atoms and A is a member of the group consisting of alkyl and hydroxyalkyl.

4. In the process of treating fibrous material with alkaline liquids of mercerizing strength the step which comprises adding to the liquid per liter 2.5 to 10 grams of a mixture consisting of 47 parts of crude cresol, 47 parts of xylenol and 6 parts of toluenesulfobutylamide.

5. In the process of treating fibrous material with alkaline liquids of mercerizing strength the step which comprises adding to the liquid per liter 2.5 to 10 grams of a mixture consisting of 98 parts of chlorxylenol and 2 parts of butansulfobutylamide.

6. An alkaline mercerizing bath for cotton material containing a phenol and a sulfamide of the general formula $R—SO_2NH—A$, wherein R is a hydrocarbon radicle of the group consisting of radicles of the benzene series and of the aliphatic series containing up to 6 carbon atoms and A is a member of the group consisting of alkyl and hydroxyalkyl.

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