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WETTING AGENT FOR ALKALINE MERCERIZING SOLUTIONS

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2 Claims. (Cl. 8—127)

My invention relates to wetting agents for alkaline mercerizing solutions, consisting of a phenolic body, a compound of a particular wetting effect, but insoluble in mercerizing solutions, and a reaction product of nitric acid on an unsaturated fatty acid.

For mercerization preferably such wetting agents are used as consist of mixtures of ingredients, on the one hand, of phenolic bodies used as solvents such as phenol, homologous cresols, xylenols or substitution products of phenols, such as chlorocresols or chloroxylenols, and, on the other hand, of compounds of a particular wetting effect, but which as such are insoluble in mercerizing solutions. A great number of such compounds has been proposed. Among them the following examples may be mentioned, this list being by no means exhaustive: hydrogenated aromatic compounds, alcohols, glycol-, polyglycol- and glycerine ethers of average molecular weight, nitrogenous bases, naphthenic acids, various sulphonamides, thiocarbamic acids or sulfamic acids of secondary aliphatic amines and the like.

According to my present invention, by the incorporation of further ingredients in such mixtures of phenolic bodies and of a wetting agent which is insoluble in mercerizing solutions, wetting agents for mercerizing solutions are obtained which are distinguished by an essentially better solubility and stronger effect than that of the hitherto known agents.

These new ingredients are obtainable by acting with nitric acid on unsaturated fatty acids, while heating. The new compounds differ from the original fatty acids by containing nitrogen and showing an increased acid number. It is supposed that the nitric acid acts on the unsaturated fatty acid in two directions, namely on the one hand by oxidizing decomposition, on the other hand by introducing nitro groups, which latter may, in addition, be acted upon in various ways, for instance, by reduction boiling with the addition of an acid or an alkali, by the action of a sulfite, without changing the characteristic properties.

According to the amount and concentration of the nitric acid employed, which may be used alone or in admixture with a dehydrating agent such as sulfuric acid, and also according to the conditions of working and the kind of the unsaturated fatty acid (oleic acid, linoleic acid, ricinoleic acid and the various technical mixtures), substances of differing constitution and effects are obtained. Instead of the fatty acids the fats themselves may be used, since they are split up by the action of the hot nitric acid.

In order to further illustrate my invention the following examples are given, the parts being by weight and all temperatures in degrees centigrade. However, I wish it to be understood that my invention is not limited to the particular products nor reaction conditions mentioned therein.

Example 1

A mixture of 76 parts of crude cresol, 4 parts of cyclohexanol and 20 parts of a nitration product of oleic acid may be used as wetting agent for mercerizing solutions.

The aforesaid nitration product has been prepared as follows. To 1500 parts of nitric acid of 40° Bé. during 8 to 10 hours at about 75 to 80°, 1000 parts of oleic acid are added, then the reaction mixture is slowly heated to about 100° and kept for some hours at this temperature.

Compared with a mixture (in the following text signified as *a*) consisting of 96 parts of crude cresol and 4 parts of cyclohexanol, not containing the above reaction product of nitric acid, on oleic acid the aforesaid mixture, which may be signified as *b*, is distinguished by a superior wetting effect in mercerizing solutions according to the following statement: of each of the mixtures *a* and *b* 15 grs. are added to one liter of an alkaline mercerizing solution of 30° Bé. Solution *a* is turbid and forms precipitates after standing a short time. Solution *b* remains entirely clear. Then in the known manner, the rapidity of shrinking of an immersed crude cotton yarn is measured with the following result:

Duration	Diminution of the original length of the cotton yarn—			
		Percent		*Percent*
10 seconds	For solution (*a*)	1.5	For solution (*b*)	4.5
20 seconds		7.0		12.0
30 seconds		11.0		14.0
40 seconds		13.5		14.5
50 seconds		14.5		15.0
60 seconds		15.0		16.0

It appears therefrom, that for solution *b* the shrinking effect is manifested immediately and the maximum is obtained after the time measured as compared with solution *a*.

Example 2

The reaction product of nitric acid, on oleic acid as described in the foregoing example, is treated for some hours with sulfurous acid with the addition of a small amount of water, in order to remove nitro groups which can be easily split off, and then the reaction product thus obtained is separated from the aqueous layer. By means of such a reaction product the following mixture *c* may be prepared:

	Parts
Reaction product	20
Crude cresol	70
Technical naphthenic acid	10

On the other hand a mixture *d* of 90 parts of crude cresol and 10 parts of naphthenic acid is prepared. When adding 10 grs. of each of the solutions *c* and *d* to one liter of an alkaline mercerizing solution of 32° Bé., solution *c* remains entirely clear, whereas solution *d* is turbid and forms precipitates after a short time.

The rapidity of shrinking is demonstrated as follows:

Duration	Diminution of the original length of the immersed cotton yarn—			
		Percent		*Percent*
10 seconds	For solution (*c*)	2.5	For solution (*d*)	1.0
20 seconds		10.0		6.0
30 seconds		14.0		11.0
40 seconds		14.5		13.0
50 seconds		15.0		13.5
60 seconds		16.0		14.0

Apparently the result is the same as stated in Example 1.

Also as second component, which has a particular wetting effect, but is insoluble in mercerizing solutions, there may be used the di-isobutylsulfaminic acid, cf. my application Ser. No. 71,875, filed March 31, 1936, now U. S. Patent No. 2,116,583 dated May 10, 1938, yielding an increased wetting effect, compared with that of the above mixture.

I claim:

1. An improved wetting agent for an alkaline mercerizing solution which comprises a phenolic compound and a wetting agent which is as such insoluble in mercerizing solutions, and a reaction product of nitric acid on a member of the group consisting of oleic, linoleic and ricinoleic acid.

2. An improved wetting agent for an alkaline mercerizing solution which comprises a phenolic compound and a wetting agent which is as such insoluble in mercerizing solutions, and a reaction product of nitric acid on oleic acid.

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