

ALIEN PROPERTY CUSTODIAN

MERCERIZING BATHS AND TREATMENTS WITH CAUSTIC ALKALI

Anton Volz, Ludwigshafen-on-the-Rhine, Germany; vested in the Alien Property Custodian

No Drawing. Application filed March 23, 1940

This invention relates to mercerizing baths and treatments with caustic alkali, containing reaction products of organic, aliphatic, aromatic and heterocyclic compounds with alcoholic or phenolic hydroxyls, with compositions of phosphoric acids poorer in water than orthophosphoric acid.

In textile processes use is frequently made of alkaline baths. There are, in addition to boiling out processes, mercerizing treatments and treatments with caustic alkali. Mercerizing generally is carried through at an alkali content of the liquor of 9% or higher than 9%, whereas in the process with caustic alkali the alkali content should preferably be lower than 9%. Mercerizing is characterized by the feature, that the treatment in aqueous alkali solutions is combined with a drawing process or a process to prevent shrinkage, in order to obtain by compensation of tensions in connection with chemical reactions a fibre-material being in a higher degree brilliant than grey-material. Treatment with caustic alkali, especially applied in the manufacture of cellulose wool, is to cause shrinkage, improvement and levelling of dye-stuff affinity.

In both cases it is desired that the fibres introduced into the lyes are uniformly steeped (wetted out), and that such untreated fibres, which are difficult to wet, sink down immediately. Different products have been proposed for said purposes, particularly phenols and combinations thereof with alcohols, tetrahydrofurfuric alcohol, naphthenic alcohol, terpene alcohol, pineoil, hydrocarbons, chlorinated hydrocarbons, amines, ketones, heterocycles, aliphatic alcohol sulphonates, fatty acid condensation products, protein condensation products and the like.

I have found that for these purposes also the reaction products of organic, aliphatic, aromatic and heterocyclic compounds with alcoholic or phenolic hydroxyls, with compositions of phosphoric acids poorer in water than orthophosphoric acid, for example pyrophosphoric acid, metaphosphoric acid, polyphosphoric acid, P_2O_5 , phosphorus and the like, are suitable.

As contrasted with sodium phosphates and organic esters of orthophosphoric acids, which do not sufficiently or not at all disperse in alkali solutions, and esters of triethylphosphate, which can only be applied within a very restricted range of concentration, the products of the present invention have the capacity of dissolving in alkali solutions of any concentration and of acting as wetting agents. By this quality they excel most

of the known mercerizing agents, which can only be employed within certain limits of concentration.

It is therefore an important progress to have found a mercerizing agent available for any concentration of lye. The new products have the further advantage of not being volatile. The baths prepared therewith consequently keep their properties and efficiency, even on standing for a longer time. Besides, these combined products show a better wetting effect than their components, and their constitution remains, even after days, the same, whereas cresolic lyes for example tend to condensation.

In addition, the products according to the present invention have another excellent quality consisting in the fact, that the phosphorus content of the bath exerts a favourable effect on the fibre, especially cellulose wool, in so far as breakage strength of the fibre at following rinsing is, even at critical alkali concentrations, much higher than with known mercerizing agents. Finally, the new products have dissolving properties for such material which slightly mix with lyes or tend to crystallization and condensation of the lyes, as for example xylenol.

The new products may be employed either alone, or in combination with each other or with one or more of the known wetting agents. Moreover, products and combinations can be prepared, which cause: rapid wetting and immediate sinking down of the wetted material, shrinkage effect of any desired degree, differentiated preservation of the part of artificial fibres, whereby various effects of fibre mixtures may be obtained.

Example 1.—50 parts of ethylmetaphosphate are mixed with 50 parts of acetone; 20 ccm of this mixture are added to a 20% caustic soda lye.

Example 2.—15 g of the reaction product of 40 g of metaphosphoric acid with 108 g of cresol, and 5 g of ethylmetaphosphate are added to a 35% caustic soda lye.

Example 3.—10 ccm of the reaction product of 20 g of metaphosphoric acid with 108 g of cresol are added to a 20% potash lye.

Example 4.—20 g of the reaction product of 20 g of metaphosphoric acid with 122 g of xylenol, are mixed with 10 g of triethanolamine, 30 g of ethylmetaphosphate and 40 g of the reaction product of 20 g of metaphosphoric acid with 108 g of cresol; 15 g of this mixture are added to one litre of caustic soda lye of 7° Bé.

ANTON VOLZ.