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ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE BLEACHING OF CELLULOSES

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Our invention relates to a combined bleaching of cellulose by hydrogen peroxide or other peroxides. It is known to bleach with hypochlorite and peroxides whereby the former was added as a last step in the treatment of cellulose in order to improve the grade of whiteness. Hereby not only the grade of whiteness will be improved but also a decrease in yellowing is observed without substantial restriction of strength. However, the bleaching with chlorine had to be carried out in a very cautious manner, to keep the cellulose free from notable quantities of oxycellulose. The disadvantage of these methods consists in a very slow consumption of the active chlorine towards the end of the bleaching process. It is therefore necessary to continue the bleaching with chlorine until the chlorine is practically consumed. Another method comprises the step of washing out after the desired grade of bleaching is obtained in order to avoid the decomposition of chlorine in excess by the peroxide. These methods caused losses in time, power, heat as well as in water or chemicals. Especially the washing out has proved disadvantageous as the contents of the hollander will be cooled down in most cases which necessitates a new heating up to the suitable reaction temperature for the treatment with peroxides.

Now we have found that excellent results will be obtained if the treatment with peroxides will be carried out before the bleaching with hypochlorite. The effect of this reversion of the bleaching steps according to our invention was not to be foreseen. Hitherto the only possibility based on economic considerations seemed to consist in the cheaper pre-treatment of the cellulose with hypochlorite and finishing with the more expensive peroxide to obtain the last bleaching effects. Thorough investigations have, however, shown, that working according to our invention results in an extraordinarily good and permanent bleaching effect, not only in the single steps but also in the combination effect whereby the expenditure of bleaching material is a relatively small one. Furthermore, there is a considerable decrease in the consumption of active chlorine which involves the special advantage of an increased sparing of the fibre material.

Our invention relates to the treatment of all kinds of cellulose, whereby for the carrying out of the various bleaching steps the well known oxygen evolving substances such as hydrogen peroxide, sodium peroxide, perborates, percarbonates and so on may be used whilst for the treatment with chlorine calcium hypochlorite, alkali hypo-

chlorite and the like are utilized. The celluloses which are used as raw material may be subjected, for instance, to a pre-treatment before the bleaching, especially if the celluloses contain relatively larger quantities of incrustations. The cellulose will then be subjected primarily to a treatment with chlorine and subsequent alkalization and according to our invention after the alkalization and the washing process advantageously treated with peroxides. The chlorinated, alkalized and washed cellulose is then treated in a subsequent step, for instance, with hydrogen peroxide or sodium peroxide under maintenance of an alkaline reaction which may be obtained, for instance, by addition of caustic soda, lime and the like. If sodium peroxide is used as oxygen evolving medium the further addition of caustic soda or the like may be omitted. In any case it has proved advantageous not to use too high a concentration of alkali in the bleaching bath, for instance, about 5 g or less, better less than 2 g per liter bleaching bath and based on sodium hydroxide. The amount of peroxide is so that it will be consumed in about one to two hours at a working temperature of 35-55° C. These temperatures may be further increased sometimes according to the stability of the bleaching bath and the quality of the treated bleaching material.

After the bleaching treatment with peroxide the after treatment with active chlorine according to our invention may be carried out in such manner that the hypochlorite solution is added immediately to the bleaching material or, especially, with higher temperatures the bleaching bath is first cooled down to temperatures of about 35° C, whereby a second washing process may be inserted and then treated with hypochlorite. The bleaching with chlorine is then continued until the desired grade of whiteness is obtained, whereupon the bleaching material is acidified and washed.

A further improvement of the grade of whiteness may be obtained by acidification at a time when the bleaching bath contains only small quantities of active chlorine and the subsequent washing out will afterwards be carried out immediately. This treatment may be combined with further subsequent bleaching treatments. For instance, a further treatment with peroxide may be inserted after the last treatment with hypochlorite.

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