

ALIEN PROPERTY CUSTODIAN

METHOD FOR THE PREPARATION OF SUPERIOR CELLULOSE

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This invention relates to a method for preparing cellulose products of superior quality which may be used for the manufacture of paper and artificial silk products. More particularly, it relates to a process for bleaching cellulose in its natural state.

Instead of cotton linters and all sorts of rags cellulosic material of various origin may be used for the manufacture of qualified, even highly qualified papers as well as for the manufacture of special artificial silk products. It is necessary that these celluloses are of a superior whiteness and have no tendency to darken subsequently; moreover, the cellulosic material must have a high fibre solidity. In the production of artificial silk the cellulosic material should consist of almost pure alpha cellulose and should be able to give solutions of high viscosity. In the manufacture of qualified papers as well as of special artificial silk products it is therefore important to use celluloses with a superior grade of purity, i. e. with a very low degree of incrustating attendant substances.

The various commercial celluloses are far from being suitable for the above mentioned purposes. By prolonged improvements it was, however, approximately possible to adapt their qualities to the requirements of the special purposes. Thus, for instance, the cellulose will be improved by a hot or cold treatment with alkaline solutions, i. e. the grade of purity will be increased, and above all the content of alpha cellulose enriched. Chlorination removes the incrustations and the desired grade of whiteness is to some extent obtained after an one stage or multi stage bleaching process.

The progressive improvement of the cellulose by increased steps of treatment, however, causes the disadvantage of a greater loss of fibres as well as of a considerable raising of the expenses. Moreover, the solidity of the fibres will be weakened to a certain extent during the long working process whereby especially the bleaching treatment with active chlorine exerts a harmful influence on the purified fibre. The attempt was therefore made to substitute the chlorine for oxygen evolving means, that is peroxygen compounds, for instance, hydrogen peroxide, sodium peroxide, sodium perborate or the like. The improvement which could be obtained by a bleaching process with oxygen was surprising: the fibre was not attacked and had a high grade of whiteness whilst the tendency to a subsequent darkening was not observed.

The treatment with oxygen evolving chemicals was hitherto carried out with a material of a definite content of cellulose of 5 to 8 percent per unit of bath liquid equal to the concentration in

bleaching with active chlorine in a hollander, in stirring vessels or bleaching hollanders. This treatment, however, has the disadvantage that the oxygen absorption takes a very long time and that in consequence thereof extension of time for this process is necessary.

Thorough investigations have now shown that this last fact is due to the extraordinarily low concentration of the peroxygen compounds. This, on the other hand, is compulsorily provoked by the low content of cellulose in the material which must be used in this method. Now I have found that the time of reaction may be considerably shortened if the fibrous material subjected to a treatment with peroxygen compounds has a higher content of cellulose. It is thereby even possible to make the process run continuously if only some precautions are observed. As the treatment is usually carried out with an alkaline reaction, the increased concentration at the same time yields to an increased purification of the cellulose. It is even possible to increase the alkalinity to such a degree that an improvement as to an improvement of the alpha cellulose content is obtained. It is therefore possible to obtain a superior as well as a bleached cellulose in one single operation step.

In carrying out my invention I proceed in such manner that after chlorination and alkalisation the cellulose is brought to a cellulose content in the material of over 10 percent, for instance, by dehydration with a cellular filter, by centrifuging or the like. After leaving the dehydration apparatus the material is digested with the necessary chemicals and intimately mixed, if necessary, with the addition of vapor for heating. By a suitable conveying agent the mass is continuously guided through receptacles such as vats, boxes or the like. The velocity of the transportation is expediently adjusted in such manner that the good passes through the vessel during a time of one half to two hours in maximo. The subsequent finishing bleaching treatment is carried out as usual, whereby the amount of hypochlorite necessary for the attainment of a definite bleaching effect is but considerably decreased. Working according to my invention has the advantage that the process for the manufacture of superior cellulose is remarkably simplified whilst the characteristic benefits of the oxygen bleaching treatment are distinctly enhanced. Besides a high grade of whiteness the thus treated fibres possess figures of viscosity which are 2.5 to 3 times as high as those of a material treated with chlorine. The process of my invention is easily adaptable to celluloses of different origin and to any kind of boiling treatment.

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