

cl 8

# ALIEN PROPERTY CUSTODIAN

## PROCESS FOR THE MANUFACTURE OF BLEACHED CELLULOSE

Emil Scheller, Lorschach I. T., Germany; vested in the Alien Property Custodian

No Drawing. Application filed July 26, 1940

In my co-pending application Serial No. 303,913 a process for the bleaching of cellulose by a combined treatment with hypochlorite and peroxide is disclosed, consisting in first bleaching with peroxide and following treatment with hypochlorite. This method may be carried out either at a simple bleaching treatment with hypochlorite even when performed in several steps or at the so-called three step bleaching method. In the last mentioned process the lignine is first treated with elementary chlorine in order to transform the incrustated lignine into chlorinated lignine which will then be dissolved by means of an alkaline treatment, thereafter rinsed whereupon the final treatment either with hypochlorite alone or with peroxide and subsequent hypochlorite treatment as disclosed in the co-pending application Serial No. 303,913 takes place.

Now I have made the surprising observation that a further simplification of this process may be attained in such manner that the crude cellulose treated with elementary chlorine with or without intermediary rinsing may directly be treated with peroxide thereby replacing the otherwise usual alkalization and then finished with a hypochlorite treatment. According to the elimination of one operation step, i. e. the alkalization, expenses, steam and water will be saved to a certain extent. In this respect it was not to be foreseen that no harmful decomposition of the peroxide used in the second operation step would occur. On the contrary, it could be expected that the chlorinated incrustation would exert a destructive effect on the peroxide thereby causing a decrease in the bleaching effect or an increase in the quantity of peroxide used. In fact, however, it was found that these apprehensions did not prove true; in many cases the by-products originating from the chlorination exert even a stabilizing effect on the peroxide. According to my invention it is therefore possible to add the peroxide immediately after the chlorination process. Sometimes it may be advisable to wholly or partly separate the chlorine solution from the cellulose by sucking off, thickening or the like, and afterwards adding the peroxide. In special cases, for instance, with cellulose with higher chlorine consumption it is ex-

pedient to rinse already during or immediately after the chlorination. But, according to my invention, no special intermediary alkaline treatment is necessary.

As acid substances will be formed during the chlorination and especially during the immediately following treatment with peroxide I have found it advantageous to take care that the alkalinity of the bath solution is maintained whilst the peroxide is added. In many cases the alkali content of the sodium peroxide alone is sufficient. Moreover, additional quantities of sodium hydroxide, sodium carbonate, potassium carbonate, calcium hydroxide may be used to secure the necessary alkalinity of the bleaching bath. It is, however, advantageous to keep the alkaline concentration at a medium level, for instance, about 5% or less, preferably less than 2%, calculated as sodium hydroxide based on the textile material. In many cases it has proved expedient to keep the alkali content as low as even possible. The amount of peroxide used in this operation step is calculated in such manner that the peroxide is consumed in nearly one to two hours at temperatures up to about 60° C.

Instead of sodium peroxide other peroxygen compounds such as sodium perborate, sodium percarbonate, sodium perpyrophosphate or hydrogen peroxide itself may be utilized. If desired, special stabilizers such as, for instance, alkali or earth alkali silicates may be added to the peroxide solutions but in many cases this is not necessary.

The treatment with peroxides is followed by a treatment with hypochlorite whereby, according to my invention, either sodium hypochlorite, potassium hypochlorite or bleaching powder are employed. The hypochlorite solution may immediately be added, expediently after an intermediary rinsing. If, however, the peroxide bleaching process is carried out at higher temperatures the bath may be cooled or rinsed down to a temperature of about 35° C., whereupon the hypochlorite will be added. The bleaching with hypochlorite is continued until the desired degree of whiteness is obtained whereupon the solution is acidified and finally rinsed.

EMIL SCHELLER.