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PROCESS FOR BLEACHING CELLULOSE FIBER

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This invention relates to a certain new and useful process for bleaching chemical pulp or any cellulose fiber to make it specially useful as a raw material for artificial silk spinning solutions although it may be used for many other purposes.

Processes are known for the bleaching of cellulose fiber by means of alkaline bleaching solution, amongst others, sodium and calcium hypochlorite, for the express purpose of obtaining pure white products. This, however, has hitherto taken place at the expense of the fiber, whilst greatly increasing the copper number and also its solubility in a solution of caustic soda or of sodium sulfide. The alkalinity of the usual bleaching liquors does not suffice to maintain the alkaline reaction during the course of the bleaching.

This invention starts from the fact that with quite small additions of caustic alkali, for example one percent, reckoned on the quantity of cellulose, in combination with the usual chloride of lime or sodium hypochlorite bleach, there is produced a cellulose of the purest whiteness, which, as regards its other qualities, also complies with the highest requirements, in particular it does not exceed a copper number of about one percent. While according to the usual bleaching processes, constituent parts soluble in sodium sulfide remain in a ratio of from 12 to 15 percent in the bleaching fiber, the products according to the new process show at most a solubility of from six to nine percent. The maintenance of definite temperatures such as is customary in the known processes, is not necessary in the case of the new process.

The process may be carried out either by adding to the fiber pulp from 0.8 to one percent, of its weight of caustic alkali or the molecular equivalent quantity of hydroxides of alkali forming metals and then supplying the bleaching liquor, or by mixing the above mentioned amount of alkali with the bleaching liquor before treating the fiber pulp therewith. It is stated that in this way the liquor maintains its alkaline reaction right up to the termination of the bleaching.

It is also possible to subject the fiber pulp to a weak preliminary bleaching in the usual way before starting the final bleaching with the weak caustic alkali or the molecular equivalent quantity of hydroxide of an alkali forming metal.

The following example will show the quantities and reagents for a bleaching unit. 3000 kg. of fiber pulp capable of being bleached are preliminarily bleached with about 70 kg. chloride of lime in the form of a calcium hypochlorite solution; it is washed out and I then add thereto about 40 kg. of caustic soda and bleach with 200 kg. chloride of lime. The pulp remains weakly alkaline to the end of the bleaching and the result is a clear white cellulose with a very low copper number (about 1%) and high percentage of alpha cellulose (about 88–90%).

If the preliminary bleaching is omitted the addition of caustic soda will be increased according to the increased consumption of chloride of lime for the alkaline phase of the bleaching.

Instead of caustic soda it is possible to use the hydroxide of any alkali forming metal, including magnesium, in the molecular equivalent proportion. This means that caustic soda is taken as a basis and the quantity of other alkali forming hydroxides when used, is reckoned therefrom. This, about 1% of caustic soda based on the amount of cellulose is an advantageous quantity. If calcium hydroxide is used in place of caustic soda, the amount taken will be such as to give a basicity to the solution corresponding to the basicity given by the use of 1% of caustic soda. It is likewise possible to combine the use of calcium hypochlorite or any other hypochlorite with the use of calcium hydroxide or any other hydroxide of the alkali forming metals including magnesium. All combinations may be used.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. The process of bleaching cellulose which comprises adding about 1 per cent of an agent selected from the group consisting of caustic alkali and hydroxides of alkaline earth metals

and magnesium, and thereupon applying bleaching liquors, thereby obtaining a product of purest whiteness, having a copper number not exceeding about 1 per cent, and having at the most about 6 to 9 per cent of constituents soluble in sodium sulfide.

2. The process of bleaching cellulose which comprises subjecting cellulose to a weak preliminary bleaching with a hypochlorite bleaching agent, freeing the cellulose from the hypochlorite and thereafter finishing the bleaching with a hypochlorite bleach liquor containing an addition of 0.8 to 1 per cent, calculated on the quantity of the cellulose, of an agent selected from the group consisting of caustic alkali and hydroxides of alkaline earth metals and magnesium, which addition of a small amount of an alkaline acting agent serves to keep the bleach liquor distinctly, but weakly, alkaline during the finishing bleaching step, thereby obtaining a bleached cellulose of purest whiteness, having a copper number not exceeding about 1 per cent and having at the most about 6 to 9 per cent of constituents soluble in sodium sulfide.

In testimony whereof I have signed my name to this specification.

DR. ERICH OPFERMANN.