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HEXAMETHYLENE TETRAMINE ACTIVATED CHLORITE BLEACH

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The present invention relates to an improved activated chlorite bleach which is especially suited for bleaching cellulosic materials.

It is known that aqueous solutions of alkali metal and alkaline earth metal chlorites can be used for bleaching various materials, especially cotton and cotton goods. In general, such solutions are activated by the addition of acids. Such activation, however, has the disadvantage that the activated solutions liberate chlorine dioxide even when cold. The chlorine dioxide liberated is not only very unpleasant physiologically but also is very corrosive. Various other substances have also been suggested for the activation of chlorite bleaching solutions.

According to the invention it was found that aqueous chlorite bleaching solutions can be activated in an excellent manner with hexamethylene tetramine. Chlorite bleaching solutions to which hexamethylene tetramine has been added do not develop chlorine dioxide when cold and they only cause bleaching at elevated temperatures, especially at temperatures of 50° C. and over, preferably between 50 and 100° C., in the presence of the goods to be bleached, especially cellulose containing goods. Preferably, the quantity of hexamethylene tetramine employed is 0.1 to 0.5 mol per mol of chlorite.

The bleaching solutions contain preferably 0.5 to 50 g. of the chlorite per liter solution. The commonly used chlorite is the sodium chlorite. In some instances the chlorites of potassium, magnesium or calcium are used.

The following examples will serve to illustrate the invention:

Example 1

A desized cotton nettle cloth was impregnated with an aqueous bleaching solution containing 12 g. $NaClO_2$, 1.2 g. hexamethylene tetramine and 1 g. of a wetting agent polyglycol ether of a fatty alcohol per liter and then held for three hours in a closed vessel at 78° C. The pH of the bleaching solution originally was 9.2 and was 4.6 after completion of the bleach. The grade of whiteness of the cloth increased from 60.3% to 85.6%. Upon completion of the bleach the cloth only contained 0.1 part by weight of unused chlorite per 100 parts by weight of cloth.

Example 2

A desized coarse cotton nettle cloth containing seed shells was impregnated with an aqueous solution containing 16 g. $NaClO_2$, 1 g. hexamethylene tetramine and 1 g. of a wetting agent polyglycol ether of a fatty alcohol per liter and then held for two hours at 93° C. in a closed vessel. The pH of the bleaching solution originally was 9.2 and was 4.6 after completion of the bleach. The grade of whiteness of the cloth increased from 55.5% to 84.6%. Upon completion of the bleach the cloth only contained 0.2 part by weight of unused chlorite per 100 parts by weight of cloth.

Example 3

A cotton cord fabric was impregnated with an aqueous solution containing 14.4 g. $NaClO_2$, 1.4 g. hexamethylene tetramine and 1 g. of a wetting agent polyglycol ether of a fatty alcohol per liter and then held for three hours at 78° C. in a closed vessel. The pH of the bleaching solution originally was 9.2 and was 4.3 after completion of the bleach. The grade of whiteness of the back side of the fabric increased from 48.8% to 78.1%. Upon completion of the bleach the fabric only contained 0.12 part by weight of unused chlorite per 100 parts by weight of the fabric.

I claim:

1. A process for bleaching cellulosic materials comprising introducing cellulosic materials into an alkaline aqueous chlorite bleaching solution containing an activating amount of hexamethylene tetramine and bleaching said materials in such solution at 50° to 100° C.

2. A process for bleaching cellulosic materials comprising introducing cellulosic materials into an alkaline aqueous chlorite bleaching solution containing a chlorite selected from the group consisting of alkali metal and alkaline earth metal chlorites, said solution containing 0.01 to 0.5 mol of hexamethylene tetramine per mol of chlorite and bleaching said materials in such solution at 50° to 100° C.

3. A bleaching solution consisting essentially of an alkaline aqueous solution of a chlorite selected from the group consisting of alkali metal and alkaline earth metal chlorites, and 0.01 to 0.5 mol of hexamethylene tetramine per mol of chlorite.

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