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PROCESS OF PREPARING CELLULOSE XANTHATE

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This invention relates to the treatment of cellulose used for the making of viscose in the manufacture of rayon or the like, and is more particularly directed to the regulation of the aging of the cellulose.

It is known that the aging of alkali cellulose for the making of viscose, which takes place as the cellulose is allowed to stand, may be accelerated by the addition to it of certain salts. The aging process always has to be adapted to the varying properties of the pulp used for making the viscose. This is accomplished by adjusting the conditions of the aging process, more particularly the temperature and the time. These adjustments require considerable skill and careful manipulation and cause trouble in the rayon plant, particularly when there are substantial variations in the properties of the pulp.

The object of this invention is thus to provide a simple method for regulating the aging capacity of the cellulose pulp, whereby the pulp entering the rayon manufacturing process may be such that it will always age under the temperature conditions of the process in a fixed period of time.

It has been found that sulphites and bisulphites delay the aging process in direct relation to the amount present in the pulp. Thus in accordance with this invention, sodium sulphite or other alkali sulphite or bisulphite is added to the cellulose pulp in such quantity as will cause the pulp to age in a desired period of time under the normal conditions of the mill. The amount required for a given pulp can be readily determined by a laboratory test or by a formula which may be readily devised to suit mill conditions. Accordingly, an alkali cellulose pulp, which on account of its particular properties would require great care in aging, by varying the temperature and the time, may be aged under the normal mill conditions by adding to it the required amount of a sulphite salt.

The addition of the sulphite salt increases the viscosity of the viscose produced from the alkali cellulose pulp and consequently rayon of higher strength may be obtained.

Furthermore, the addition of such salts gives a higher yield of alpha cellulose after aging and consequently a higher yield and higher strength of rayon is produced from such alkali cellulose. These increased values vary with the addition of the salt.

The sulphite salt may be added during the disintegration of the alkali cellulose pulp in the rayon mill. It may be added to the alkali solution used for mercerizing the pulp. In the latter case more of the salt would be required inasmuch as some of it would be removed when the pulp sheet is subjected to the usual pressing process.

Furthermore, the sulphite may be added to the pulp itself so as to produce pulp which will require fixed aging conditions and these conditions may be such as to give the greatest benefit to the rayon to be produced from the pulp. The amount of sulphite added will vary in accordance with the properties of the pulp in order to make it possible to maintain the fixed aging conditions.

It is unnecessary and impracticable to indicate specifically the amount of salt required for each particular case, but as indicated the same may be readily determined. The following examples are given as specific illustrations of the effect of the addition of particular percentages of the salt.

(1) A pulp giving a viscose with a viscosity of 21 seconds (according to the Ball fall method) would require 72 hours of aging at a temperature of 20° C. In order to delay the aging process for 12 hours it is necessary to add to the pulp, before or during disintegration, 0.38% of sodium sulphite. It is preferable to allow the disintegrator to run for a short time before adding the sodium sulphite and to then continue the disintegration of the pulp until it is completed.

(2) The viscose produced from a certain

pulp shows a viscosity of 17 seconds. This is too low to give rayon of the properties desired and a viscosity of about 23 is required. This higher viscosity could be obtained by changing the normal aging conditions from 20° C. to 18.4° C. or from 72 hours to 61 hours, but such changes cannot be readily and quickly effected. These changes may be avoided and the desired results obtained by adding to the pulp 0.50% of sodium sulphite and the pulp will then give the desired properties after aging under the normal conditions. An addition of 1.56% of the salt would give the viscose produced from this pulp a viscosity of 34 seconds, when aged under the normal conditions mentioned.

As a general indication of the way in which the amount of salt required by a particular pulp may be determined the following formula is given: $V=10.6p+b$, where b is the viscosity of the viscose obtained under normal conditions, V the viscosity required to produce rayon or the like, having the desired characteristics, and p the percentage of salt (calculated on the bone dry pulp) to be added.

It will be understood that the term "sulphite" as used in the appended claims is intended to include "bisulphite."

I claim:

1. A process of regulating the aging capacity of alkali cellulose which comprises adding an alkali metal sulphite to the cellulose.

2. A process of treating bleached alkali cellulose pulp which comprises adding to the pulp alkali metal sulphite to delay the aging of the cellulose in the production of rayon or the like.

3. A process of treating bleached cellulose pulp which comprises adding alkali metal sulphite to the pulp and then mercerizing the same with caustic alkali.

4. A process of treating cellulose pulp which comprises subjecting the pulp to the action of a caustic alkali solution and thereafter adding sodium sulphite to the so-treated pulp.

5. A process as defined in claim 3, wherein the said alkali metal sulphite is added to the caustic alkali solution used for mercerizing the pulp.

6. In the production of cellulose pulp for the manufacture of rayon or the like, the method which comprises maintaining the viscosity of viscose made from said pulp substantially constant under normal aging conditions by adding sodium sulphite to said pulp.

7. In the treatment of bleached alkali cellulose for the manufacture of rayon or the like, the method which comprises fixing the aging capacity of said cellulose in accordance with normal conditions in the rayon manufacture plant by adding to said cellulose an amount of alkali metal sulphite, said amount being predetermined by the character of said pulp and the said normal conditions.

8. As a new product, pulp consisting of cellulose and sodium sulphite, the amount of the latter being fixed in accordance with the aging characteristics desired in the pulp.

In testimony whereof I have affixed my signature.

R. DOSNE.