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CELLULOSE BOILING

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It is a generally known fact in the cellulose industry that a stronger cellulose is obtained if the alkaline solutions employed for boiling said cellulose contain a certain amount of soda combined with sulphur than if boiling is effected only with soda. In fact, the presence of sulphur compounds as soda monosulphide and soda polysulphide facilitates greatly the operation which consists in eliminating from the cellulose fibres the encrusting and agglutinative substances whilst reducing the force of attack of the soda on the fibres.

Until now, said sulphur compounds have been incorporated to the alkaline solutions whilst recovering the soda. In fact, the amounts of soda lost during said operation are compensated in the sulphate method by adding sodium sulphate during the filling of the melting furnace. In this case the mass coming out from the melting furnace contains, besides sodium carbonate and sodium hydroxide, sulphur compounds as sodium sulphate (Na_2SO_4) (a part not reduced), sodium sulphide (Na_2S) and small quantities of sodium bisulphite (Na_2SO_3), sodium thiosulphate ($Na_2S_2O_3$) etc. The masses coming out from the melting furnace are then causticized with lime.

The present invention consists in adding a certain quantity of preferably pulverized sulphur to the alkaline solutions employed for boiling of the cellulose and in the compositions of which enters no sulphur compounds or only a small amount thereof. Said sulphur addition is preferably effected in the washing boiler during filling thereof; however it may also be added to the prepared alkaline lye ("white lye").

The amount of sulphur to be added varies according to the nature of the vegetal material employed. Where the raw material consists in wood, there is to be added approximately 16 to 40 lbs. (accord'ng to the nature of wood employed) per 1000 lbs. of wood, supposed to be dry, for calculation. A suitable rate of sodium hydroxide weight to added sulphur weight is 8 to 1 or 9 to 1.

By adding in this manner sulphur to the (alkaline) boiling solutions the favorable influence of the sulphur compounds on the treated vegetal material is substantially increased. Thus it has been demonstrated by tests that boiling according to the present invention provides a substantial increase of cellulose output. Said increase, which has been ascertained for wood as well as for plants, is not due to incomplete de-incrustation, but probably to the fact that sodium-sulphur compounds are not formed before the boiling process reaches a very high temperature and pressure, and therefore there remains in the lye, at the high temperature and high pressure level, much sodium-sulphur compounds which reduce the force of attack exerted by the caustic soda on the cellulosic material during the very fastidious part of boiling. In industrial tests made with "Pinus Maritima" treated according to the present invention, there has been obtained a cellulose output of 50 per cent, while control tests effected according to the ordinary sulphate method have given an output of only 42 per cent. During said tests there has also been ascertained that the boiling time may be substantially reduced where boiling is effected according to the present invention.

However the adding of sulphur to the alkaline solutions provides not only an increase in cellulose output, but also an increased strength of said cellulose. Said increase is a very considerable one, compared to boiling made with caustic soda only, but it is also noticeable compared to sulphate boiling.

Furthermore, boiling according to my invention has this advantage over the ordinary sulphate method that it avoids almost completely the characteristic bad smell of sulphate works.

While there is disclosed the fundamental novel features of the invention, it will be understood that various omissions, substitutions and changes in the details of the method described may be made by those skilled in the art without departing from the spirit of the invention, and it is the intention therefore that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

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