

Naturally colored cotton cellulose nanofibers: Preparation and characterization

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Three naturally colored cotton: white, green and brown, were used to prepare cellulose nanofibers by using a combination of chemical, thermal and mechanical treatments. Colloidal stable aqueous and colored suspensions of cellulose nanocrystallites were obtained. The morphology of nanofibers was characterized by using field emission scanning (FEG), atomic force microscopy (AFM) and x-ray diffraction. Other characterizations, such as cellulose content of original colored fibers, yield of extraction and thermal stability (thermogravimetric analysis - TG) of fibers and their respective nanofibers under oxidative atmosphere were also performed.

The results indicate that nanofibers have an average diameter of 10-15 nm and length of 125 to 350 nm. The white nanofibers presented the highest yield and brown nanofibers the highest dispersion in dimensions and were less thermally stable than the other nanofibers.

These nanofibers isolated from biomass can be used as nanoreinforcement in polymer matrices.

Keywords: naturally colored cotton, cellulose nanofibers, characterization of cellulose nanofibers.

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