Production of nanofibrillated cellulose by using steam explosion and enzymatic hydrolysis coupled with a twin screw extrusion

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The development of the new, energy efficient and environmentally friendly disintegration methods becomes a priority in the industrialization of nanofibrillated cellulose (NFC) production. This study focused on the use of environmentally friendly pretreatments, enzymatic hydrolysis and steam explosion, coupled with the mechanical fibrillation in a twin screw extruder in order to produce NFC with high consistency. Various analyses were used to investigate influence of used pretreatments on the fibrillation process, NFC morphology, NFC crystallinity and thermal properties.