NANOFIBRILLATED CELLULOSE FILMS: UP-SCALED PRODUCTION, PROPERTIES AND POTENTIAL APPLICATIONS

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ABSTRACT

Due to the development of energy efficient and up-scalable production methods, together with its outstanding properties (i.e. renewable, biocompatible, and biodegradable), nano-sized cellulosic materials had attracted lots of attention in the last few decades, from both, academic and industrials sectors. The use of NFC in the production of dense films has proven to be promising due not only to the strength of the films as well as its excellent barrier properties. An up-scaled method for NFC film manufacture had been developed by VTT in cooperation with Aalto University, by using devices already available in the industry, allowing the production of several meters of plastic-like NFC films. These dense films are translucent and smooth, with excellent printing quality and oxygen barrier properties. An overview on the production, modification and characterization of these plastic-like films will be discussed, together with the most significant results and potential applications.