Production of nanocellulose from banana peel (musa acuminata) via one-pot oxidation-hydrolysis system

ABSTRACT

Nanocellulose (NC) has drawn growing attention over the last two decades considering it a green biopolymer in diverse value-added applications. The methodological approach employing a one-pot oxidation-hydrolysis system for banana peel (Musa acuminata) leading to the production of NC was demonstrated and analysed in this study. The one-pot approach involved less harmful chemicals, although it produces a low yield of banana peel NC compared to the conventional method. XRD measure indicated that the isolated NC possessed diffractogram patterns to typical XRD patterns of pure cellulose, which contained three intense peaks 2θ = 16o, 22o , and 31o. The crystallinity index is considerably high at 51.2%. FESEM evaluation revealed a considerable size reduction during the one-pot process. In this study, a sustainable methodological approach has been proposed for banana peel waste management and its unique properties for future applications in various fields