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Short Communication

Recovery of cellulose fibers from oil palm empty fruit bunch for pulp and paper using green delignification approach

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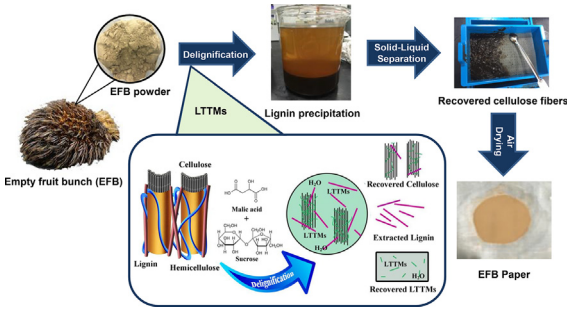
GRAPHICAL ABSTRACT



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ABSTRACT

The aim of this work was to recover the cellulose fibers from EFB using low-transition-temperature-mixtures (LTTMs) as a green delignification approach. The hydrogen bonding of LTTMs observed in ^{1}H NMR tends to disrupt the three-dimensional structure of lignin and further remove the lignin from EFB. Delignification process of EFB strands and EFB powder were performed using standard L-malic acid and cactus malic acid-LTTMs. The recovered cactus malic acid-LTTMs showed higher glucose concentration of 8.07 mg/mL than the recovered L-malic acid LTTMs (4.15 mg/mL). This implies that cactus malic acid-LTTMs had higher delignification efficiency which led to higher amount of cellulose hydrolyzed into glucose. The cactus malic acid-LTTMs-delignified EFB was the most feasible fibers for making paper due to its lowest kappa number of 69.84. The LTTMs-delignified EFB has great potential to be used for making specialty papers in pulp and paper industry.

1. Introduction

The consumption for pulp and paper products is rising proportionally with the population growth in the world. Global paper demand is predicted to increase by an average of 2.1% per year (Suseno et al., 2017). Pulp and paper industry utilizes both hardwood and

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