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Microwave facilitated one-pot bioconversion of sugarcane bagasse using novel ternary deep eutectic solvent

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PURPOSE OF THE ABSTRACT

Deep eutectic solvents (DESs) have gained considerable impetus in recent years due to their biodegradability, biocompatibility, low cost, low toxicity, relatively easy processing, recyclability, and reusability. In this study, the dual functionality of a ternary DES, Choline chloride: Glycerol: NiCl2 (CC:Gly:Ni) at a molar ratio 1:2:0.016, as a green solvent for pre-treatment and a catalyst for bioconversion of sugarcane bagasse (SB) in a microwave-assisted system has been explored. Under optimized condition (pre-treatment temperature, time and solid/liquid ratio) ternary DES CC:Gly:Ni catalytically improve delignification efficiency and glucose recovery. The glucose yield was determined using HPLC, LC-MS, GC-MS while the physico-chemical properties of the SB fibres were analysed by SEM, FTIR, XRD and TGA. The DESs were further recovered after microwave processing and could be reused upto 5 subsequent cycles with the same efficiency.

FIGURES

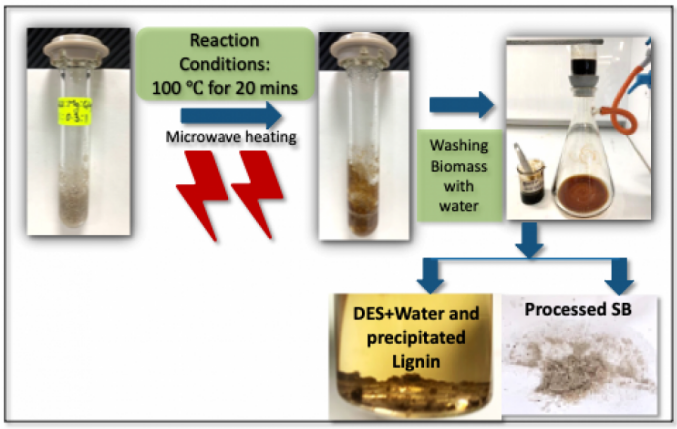

FIGURE 1

Process Flowchart

Microwave assisted one pot process

FIGURE 2

KEYWORDS

Deep eutectic solvents | sugarcane bagasse | delignification | microwave processing

BIBLIOGRAPHY