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Short Communication

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A novel ternary combination of deep eutectic solvent-alcohol (DES-OL) system for synergistic and efficient delignification of biomass

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ABSTRACT

A novel ternary system consisting of deep eutectic solvent-alcohol (DES-OL) mixture was developed for the effective delignification of lignocellulosic biomass. Optimization studies included selecting suitable co-solvent (among *n*-BuOH, *n*-PrOH&EtOAc) for treating biomass (rice husk, rice straw and wheat straw), altering the DES-to-alcohol ratio (2:1, 1:1&1:2) as well as the reaction temperature (50, 80 & 120°C). The highest delignification (~50%) was observed using *n*-butanol assisted DES (ChCl: OA) at a ratio of 2:1, with high solid loading of 15 % (w/v) at 120°C (~1.2 bar) in a 60 min reaction. Post pretreatment, high purity lignin was recovered after distilling off butanol for recycling. Microscopy and CPMAS/NMR studies confirmed the effectiveness of DES-OL pretreatment on biomass delignification.

Key words: DES-OL; Pretreatment; Lignocellulosic biomass; Delignification.

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