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DEEP EUTECTIC SOLVENTS AS GREEN SOLVENTS FOR LIGNIN EXTRACTION FROM LIGNOCELLULOSIC BIOMASS

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Abstract

Lignin, a vital component of lignocellulosic biomass, holds great promise as a renewable resource for various biofuels, chemicals, and advanced materials due to its rich aromatic structure and high energy content. Nevertheless, conventional lignin extraction methods, such as kraft pulping and organosolv processes, pose challenges due to their cost, energy intensity, and difficulties in selectively separating lignin from cellulose and hemicellulose. These challenges often result in co-extraction or degradation of essential components. Deep eutectic solvents (DESs) have emerged as a promising solution for lignin extraction, offering flexibility and selective lignin dissolution while preserving cellulose and hemicellulose. Despite substantial research efforts, the utilization of DESs for lignin extraction remains in its early stages. This review highlights the principles of lignocellulosic biomass structure, the type of DESs, and the intricacies of lignin extraction and solubility. The key factors influencing lignin yield and structural integrity are discussed. Furthermore, this review summarizes the latest advancements in lignin extraction employing DESs, showing the exciting potential of this innovative approach.

Keywords: biomass pre-treatment, deep eutectic solvents (DESs), green solvent, lignocellulosic biomass, lignin extraction

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