

Clean Energy Production Technologies
Series Editors: Neha Srivastava · P. K. Mishra

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Bioenergy Research: Integrative Solution for Existing Roadblock

 Springer

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Lignin Depolymerization Strategy and Role of Ionic Liquids

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Ajay Kumar Chauhan, Swapna Kumar Srivastava, and Sonam Singh

Abstract

Lignocellulosic biomass (LCB) is present in abundance on the earth, which comprises lignin as crucial component, responsible for recalcitrant nature when exposed to pretreatment strategy. In the present scenario, lignocellulosic-based biorefinery is increasing to fulfil the demand of fossil fuel. Therefore, lignin valorization into value-added product is an advantage. Various strategies have been implemented to suitably degrade or valorized lignin into valuable chemical. But no single strategy has been successfully implemented for commercial purpose. In recent times ionic liquid shows very promising role in LCB dissolution strategy, and several low cost and biocompatible ionic liquids (ILs) such as choline based discovered. These choline-based ILs have potential to be suitably “designed” in a such a way by keeping balance between cation and anion present in it. Subsequently, it can be tuned with suitable selected enzymatic catalysis with high amount of lignin dissolution resulting in degraded product formation in the same stream. It is essentially required to design operation parameters which favour combination of catalyst/biocatalyst, ILs, and process conditions. Therefore, in this book chapter, several strategies with promising ionic liquid compatibility are discussed in detail.

Keywords

Lignocellulosic biomass · Ionic liquid · Lignin valorization

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