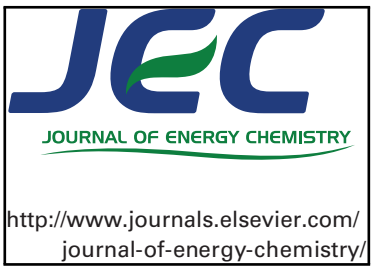

Selective extraction and conversion of lignin in actual biomass to monophenols: A review

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Review

Selective extraction and conversion of lignin in actual biomass to monophenols: A review

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Abstract

Our over dependency on the fossil resource for industrial chemicals and fuels faces great challenges. Recently, the production of monophenols from lignin in lignocellulosic biomass is regarded as a promising process for sustainable biofuels. This article discusses the conversion of lignin in actual biomass directly to monophenols. The two step way including extraction of lignin from biomass and further degradation of the lignin oligomers to monophenols is especially discussed. The obtained monophenols can also be converted to chemicals with low-oxygen content via hydrodeoxygenation process. For extraction of lignin, co-solvent system is the most adopted for hydrolysis or solvolysis of lignin assisted by acid or alkaline catalysts. The structure of the obtained oligomers derived from lignin is discussed in detail. For lignin depolymerization, hydrogenolysis is an efficient method with the use of gaseous hydrogen or alcohols as hydrogen source. At the meantime, depolymerization mechanism and the route for repolymerization of the reaction intermediates are presented here. In hydrodeoxygenation process, metal catalysts, especially noble metal catalysts are required. The precise effects of the reaction solvents and catalysts on extraction and degradation of lignin need to be further investigated, and this will benefit to design more efficient strategies for lignin utilization.

Key words: Lignin; Monophenols; Actual biomass; Catalytic conversion; Review

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