

Accepted Manuscript

Review

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PII: S0960-8524(18)31169-6
DOI: <https://doi.org/10.1016/j.biortech.2018.08.065>
Reference: BITE 20348

To appear in: *Bioresource Technology*

Received Date: 29 June 2018
Revised Date: 14 August 2018
Accepted Date: 16 August 2018

Please cite this article as: Cao, L., Yu, I.K.M., Liu, Y., Ruan, X., Tsang, D.C.W., Hunt, A.J., Sik Ok, Y., Song, H., Zhang, S., Lignin valorization for the production of renewable chemicals: State-of-the-art review and future prospects, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.08.065>

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Lignin valorization for the production of renewable chemicals: State-of-the-art review and future prospects

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Abstract: Lignin is an abundant biomass resource in aromatic structure with a low price in market, which can serve as renewable precursors of value-added products. However, valorization rate of annually produced lignin is less than 2%, suggesting the need for technological advancement to capitalize lignin as a versatile feedstock. In recent years, efficient utilization of lignin has attracted wide attention. This paper summarizes the research advances in the utilization of lignin resources (mainly in the last three years), with a particular emphasis on two major approaches of lignin utilization: catalytic degradation into aromatics and thermochemical treatment for carbon material production. Hydrogenolysis, direct pyrolysis, hydrothermal liquefaction, and hydrothermal carbonization of lignin are discussed in detail. Based on this critical review, future research directions and development prospects are proposed for sustainable and cost-effective lignin valorization.

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