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## Lignin Valorization by Cobalt Catalyzed Fractionation of Lignocellulose to Yield Monophenolic Compounds

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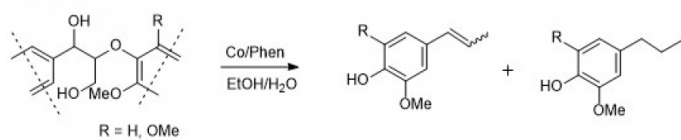
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### PURPOSE OF THE ABSTRACT

In our work we present a catalytic reductive fractionation system for lignocellulosic biomass. The system is based on a heterogeneous cobalt catalyst and formic acid or formate as a hydrogen source. Untreated birch wood yielded monophenolic compounds in up to 34 wt% yield of total lignin, 76% of the theoretical maximum yield. The main role of the cobalt catalyst, revealed by model compound studies, is to stabilize the reactive intermediates molecules produced during the organosolv pulping. This occurs by transfer hydrogenation and hydrogenolysis reactions. Moreover, the proposed cobalt catalyst is playing a main role in depolymerization reactions of lignin fragments thanks to transfer hydrogenolysis reactions on the  $\beta\text{-O}$  bond, the most abundant in lignin. The catalyst is still active after three cycles losing less than 10% in efficiency, demonstrating the robustness of the proposed system.[1]

## FIGURES



**FIGURE 1**

Scheme.1

Main products of biomass fractionation using the proposed catalyst.

**FIGURE 2**

## KEYWORDS

biomass fractionation | cobalt | heterogeneous catalysis | lignin

## BIBLIOGRAPHY

[1] S. Rautiainen, D. Di Francesco, S. N. Katea, G. Westin, D. N. Tungasmita, J. S. M. Samec, ChemSusChem 2019, 2, DOI 10.1002/cssc.201802497.