

Selective heterogenous catalytic trimerization of xylose-derived furfural and 2-methylfuran to diesel precursors on a continuous fixed-bed reactor

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The valorization of xylose and the condensation of furfural and 2-methylfuran (2-MF), obtained by the dehydration and selective hydrogenation of xylose, to produce high-carbon-number hydro-carbons.

Thus, environmentally friendly catalysts exhibiting comparable activities will help in the development of economically benign processes.

2-methylfuran is the selective hydrogenation product of furfural, which can be produced in industrial scale with lignocellulose. In this work, renewable diesel precursors were synthesized simultaneously by the solvent-free hydroxyalkylation/alkylation(HAA) followed by hydrodeoxygenation(HDO).

The catalytic trimerization of 2-methylfuran was performed to produce diesel precursors of C15 hydro-carbons using solid acid catalysts that can replace environmentally harmful sulfuric acid. Among the solid acid catalysts used in this work, Amberlyst-15 exhibited the best activity and selectivity for the HAA of 2-MF.