

Direct Hydrocyclization of Biomass-Derived Levulinic Acid to 2-Methyltetrahydrofuran over Nanocomposite Copper/Silica Catalysts

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Nanocomposite Cu/SiO₂ catalysts, which were prepared by a precipitation-deposition method, are effective for the hydrocyclization of biomass-derived carboxylic acids such as LA, SA, and FA to the corresponding cyclic hydrofurans or cyclic lactones in vapor phase reactions at moderate H₂ pressures. In the reaction of LA, the Cu/SiO₂ catalysts shows increased selectivity for MTHF with increasing the copper loading up to 80 wt%. The addition of nickel to the catalyst with a high copper loading shows the effect of the promoter, through the enhanced selectivity.

The nanocomposite catalysts can be used for long-term reactions without remarkable sintering and leaching of copper, and so could be promising candidates for hydrocyclization or hydrogenation in biorefinery research.