

Selective Cu and Ni-MOFs as pre-catalysts for the hydrogenation of furfural to furfuryl alcohol†

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Abstract

In this work, we report the design of one-dimensional (1D) metal–organic framework containing Cu(II) and Ni(II) active sites using a *N,N'*-bis-(4-pyridyl)isophthalamide linker to form **MOF 1** [$\text{Cu}_{1/2}(\text{L1})(\text{NO}_3^-)\cdot\text{DMF}$] and **MOF 2** [$\text{Ni}_{1/2}\text{L1Cl}$]. The MOFs were evaluated as heterogeneous catalysts for the hydrogenation of furfural to furfuryl alcohol. **MOF 2** catalyst showed impressive performance with conversion of FF (81%) and selectivity towards FA (100%). Post-experimental characterisation showed that the structural integrity of the **MOF 2** was not altered after catalysis. The catalyst could also be reused several times without any significant loss in activity and selectivity. Furthermore, a possible plausible reaction mechanism of the reaction over **MOF 2** was proposed.

