A Single-Atom Cobalt Catalyst Supported on SBA-15 for Hydrodeoxygenation and Hydrogenation

Significance: A single-atom cobalt catalyst supported on porous nitrogen-doped carbon [Co@NC-(SBA)], prepared according to Equation 1, catalyzed the hydrodeoxygenation of lignin-derived compounds (eq. 2) and the hydrogenation of nitrobenzenes (eq. 3) to give the corresponding products with up to 99% selectivity and 99% yield.

Comment: In the hydrodeoxygenation of vanillin, the catalytic activity of Co@NC-(SBA) was clearly superior to that of Co catalysts supported on various silicas (MCM-41, FDU-12) and to that of various metals (Fe, Ni, Cu) supported on SBA-15. In the hydrogenation of p-nitrochlorobenzene, the catalyst was reused nine times without loss of its catalytic activity.