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SYNFACTS Highlights in Current Synthetic Organic Chemistry

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Category

Polymer-Supported Synthesis

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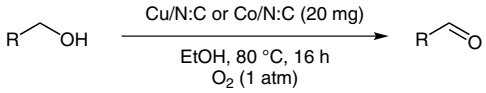
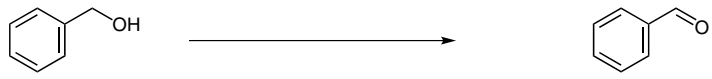
Cooperative Catalysis for Selective Alcohol Oxidation with Molecular Oxygen
Chem. Eur. J. **2016**, *22*, 12307–12311.

Oxidative Dehydrogenation of Alcohols with Metal Oxides on N-Doped Carbon

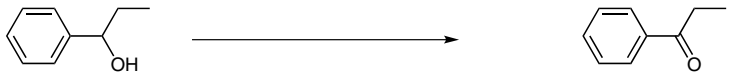


Cu/N:C ([metal ion]/[dopant]:[support]) = a copper oxide on nitrogen-doped carbon
Co/N:C ([metal ion]/[dopant]:[support]) = a cobalt oxide on nitrogen-doped carbon

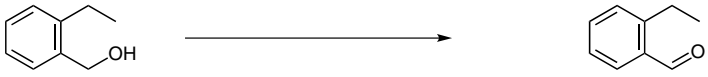
Selected results:



Cu/N:C, 19% conversion, 92% selectivity
Co/N:C, 29% conversion, 91% selectivity



Cu/N:C, >99% conversion, >99% selectivity
Co/N:C, >99% conversion, >99% selectivity



Cu/N:C, 18% conversion, 94% selectivity
Co/N:C, 25% conversion, 93% selectivity

Cu/N:C, 8% conversion, 83% selectivity
Co/N:C, 8% conversion, 38% selectivity

Significance: Oxidative dehydrogenation of alcohols on copper oxide/nitrogen-doped carbon (Cu/N:C) at 80 °C gave the corresponding aldehydes or ketones with 8–99% conversion and 83–99% selectivity. A similar reaction on cobalt oxide/nitrogen-doped carbon (Co/N:C) proceeded with 8–99% conversion and 38–99% selectivity.

Comment: The authors have previously reported the preparation of nitrogen-doped carbon catalysts for oxygen reduction (*Chem. Eur. J.* **2016**, *22*, 501). The catalytic activities of Cu/N:C and Co/N:C were higher than those of Fe/N:C, Ni/N:C, Zn/N:C, Mn/N:C, Mo/N:C, Mg/N:C, or Pb/N:C catalysts.

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