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Atomically Dispersed Co Catalyst for Efficient Hydrodeoxygenation of Lignin-Derived Species and Hydrogenation of Nitroaromatics

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

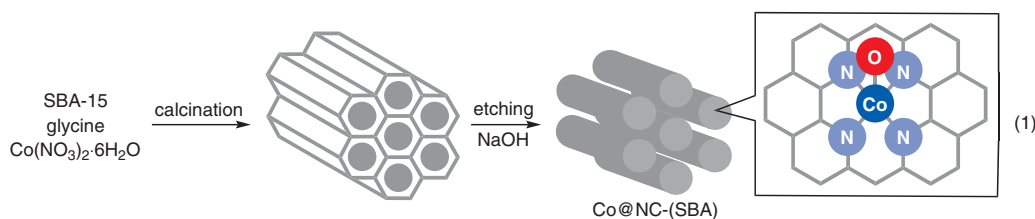
Category

Polymer-Supported Synthesis

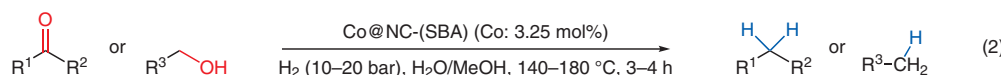
Key words

cobalt catalysis  
single-atom catalyst  
hydrodeoxygenation  
hydrogenation  
lignin-derived species  
nitrobenzenes

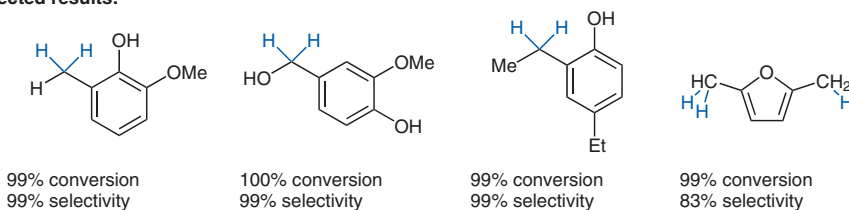
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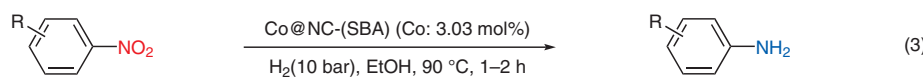
### Hydrodeoxygenation of lignin-derived species:



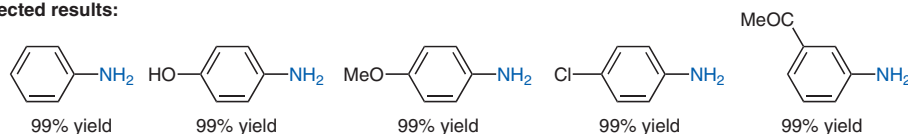
#### Selected results:



### Hydrogenation of nitrobenzenes:



#### Selected results:



**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.

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