Category

Polymer-Supported Synthesis

Key words

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Poly(4-vinylpyridine-*co*-divinylbenzene) Supported Iron(III) Catalyst for Selective Oxidation of Toluene to Benzoic Acid with H_2O_2

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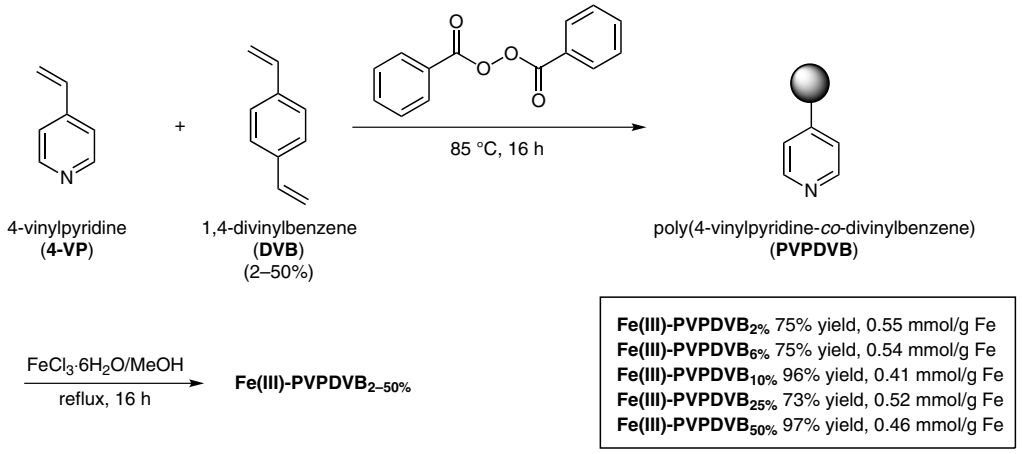
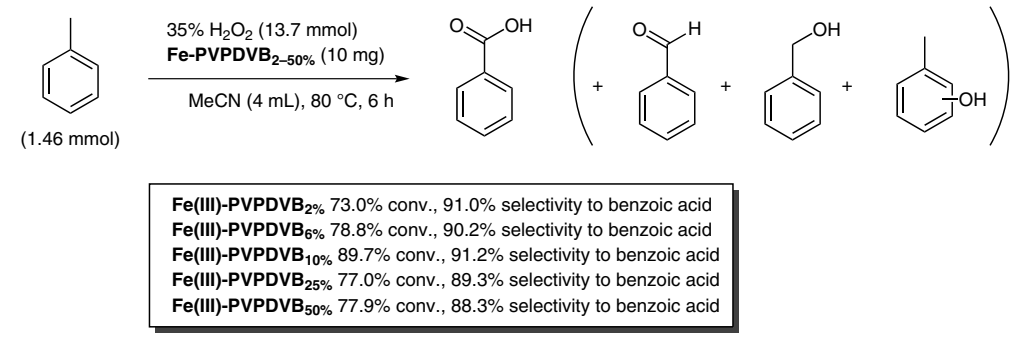
Polymer-Supported Iron(III) Catalyst for the Selective Oxidation of Toluene





Significance: Poly(4-vinylpyridine-*co*-divinylbenzene)-supported iron(III) catalysts bearing different amounts (2–50%) of DVB cross-linker [Fe(III)-PVPDVB$_{2–50\%}$] were prepared and applied to the oxidation of toluene with hydrogen peroxide (73.0–89.7% conversion, 88.3–91.2% selectivity to benzoic acid). The polymer-supported catalyst containing 10% DVB [Fe(III)-PVPDVB$_{10\%}$] led to the selective oxidation of toluene to benzoic acid in 90% conversion with up to 96% selectivity under optimized conditions.

Comment: The catalytic activity of reused Fe(III)-PVPDVB$_{10\%}$ decreased due to leaching of iron ions from the polymer support. No oxidation of toluene occurred in the absence of the polymer-supported iron catalysts or in the presence of iron-free PVPDVB. The toluene oxidation with the homogeneous counterpart, $FeCl_3·H_2O$, resulted in lower substrate conversion (<58%), while the reaction selectivity was as high as with the polymeric catalyst (92%).

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