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Magnetically recyclable nanocatalyst with synergetic catalytic effect and its application for 4-nitrophenol reduction and Suzuki coupling reactions

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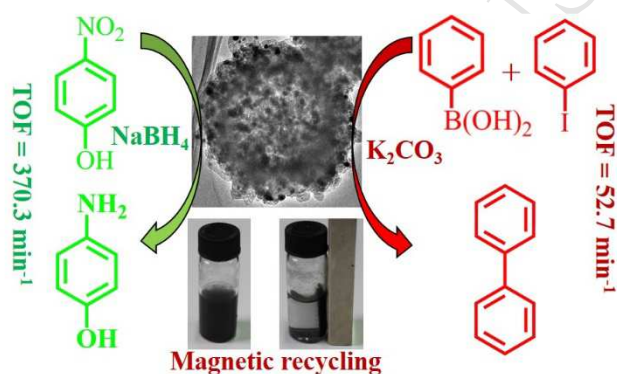
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Graphical Abstract

In this work, we developed a facile method to fabricate a new type of recyclable nanocatalyst based on double-shelled hollow nanospheres (HNSs) supported Pd nanoparticles (NPs), in which magnetic Fe species was served as inner shell and nitrogen doped carbon (NC) as outer shell. The magnetic Fe-based inner shell, catalytically active outer NC shell combined with ultrafine Pd NPs synergistically enhanced the catalytic activity and recyclability in organocatalysis. The turnover frequency (TOF) is up to 370.3 min^{-1} , which is one of the highest efficiencies reported for 4-nitrophenol reduction reaction. Furthermore, Fe@NC@Pd can also be applied for Suzuki coupling reaction with the TOF as high as 52.7 min^{-1} .



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