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Dual Pd and $CuFe_2O_4$ Nanoparticles Encapsulated in a Core/Shell Silica Microsphere for Selective Hydrogenation of Arylacetylenes
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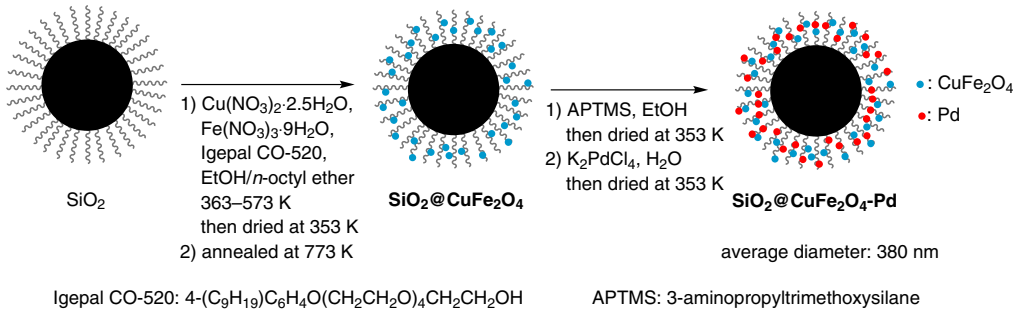
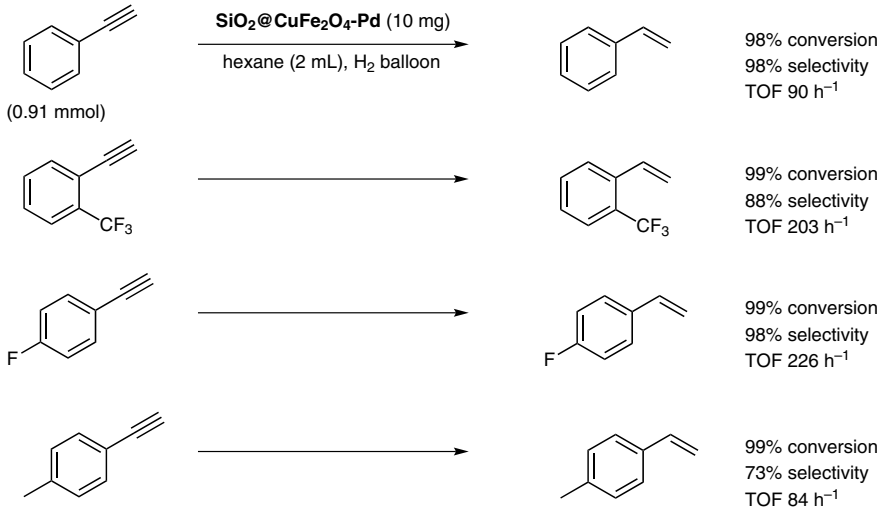
Dual Pd and $CuFe_2O_4$ Nanoparticles in a Core/Shell Silica Microsphere





Significance: A dual catalyst containing Pd and $CuFe_2O_4$ nanoparticles in a core/shell silica microsphere (SiO_2@$CuFe_2O_4$-Pd) for selective hydrogenation of arylacetylenes to styrenes was described. A sequential modification of SiO_2 with $CuFe_2O_4$ and Pd nanoparticles led to the formation of the dual catalyst SiO_2@$CuFe_2O_4$-Pd. The hydrogenation of arylacetylenes was performed in hexane under H_2 (1 atm) using SiO_2@$CuFe_2O_4$-Pd to give the corresponding styrenes in 98–99% conversion with 73–98% selectivity.

Comment: SiO_2@$CuFe_2O_4$-Pd was prepared on the basis of the authors' previous work (*Chem. Mater*. **2008**, *20*, 6738). The SiO_2@$CuFe_2O_4$-Pd catalyst was recovered by using an external magnet and reused in the hydrogenation of phenylacetylene (1st use: 98% conversion, 98% selectivity; 2nd use: 99% conversion, 98% selectivity; 3rd use: 98% conversion, 97% selectivity). SiO_2@$CuFe_2O_4$-Pd was characterized by powder X-ray diffraction, TEM, EDX, HR-SEM, ICP, field-dependent magnetization, etc.

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selective hydrogenation
heterogeneous catalysis