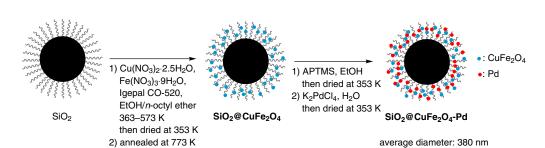
K. H. LEE, B. LEE, K. R. LEE, M. H. YI, N. H. HUR* (SOGANG UNIVERSITY, SEOUL, KOREA) Dual Pd and $CuFe_2O_4$ Nanoparticles Encapsulated in a Core/Shell Silica Microsphere for Selective Hydrogenation of Arylacetylenes

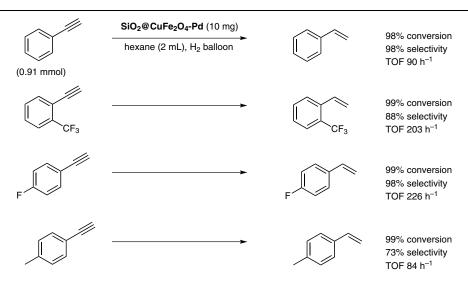
Chem. Commun. 2012, 48, 4414-4416.

Dual Pd and CuFe₂O₄ Nanoparticles in a Core/Shell Silica Microsphere



Igepal CO-520: 4-(C $_9$ H $_{19}$)C $_6$ H $_4$ O(CH $_2$ CH $_2$ O) $_4$ CH $_2$ CH $_2$ OH

APTMS: 3-aminopropyltrimethoxysilane



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: SiO₂@CuFe₂O₄-Pd was prepared on the basis of the authors' previous work (*Chem. Mater.* **2008**, *20*, 6738). The SiO₂@CuFe₂O₄-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). SiO₂@CuFe₂O₄-Pd was characterized by powder X-ray diffraction, TEM, EDX, HR-SEM, ICP, field-dependent magnetization, etc.

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Polymer-Supported Synthesis

Key words

dual catalysts

nanoparticles

selective hydrogenation

heterogeneous catalysis

