Palladium nanoparticles supported on copper oxide as an efficient and recyclable catalyst for carbon(sp2)-carbon(sp2) cross-coupling reaction

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ABSTRACT

A convenient, mild and cost-effective synthesis of Pd/CuO nanoparticles by arc discharge of Cu in deionized (DI) water and electroless deposition of palladium was reported. The obtained nanoparticles were thoroughly characterized by using techniques like TEM, XRD, FE-SEM and EDS. The synthesized nanoparticles demonstrated excellent catalytic activity in Heck coupling reaction under aerobic conditions. The effects of catalyst composition, solvent and bases, aryl halides or olefins species on corresponding products were systematically investigated. High product yields, elimination of ligand and homogeneous catalysts, broad substrate scope and easy work up are important features of this method. In addition, the catalyst could be reused for five more consecutive recycles.