In situ generated Pd(0) nanoparticles stabilized by bis(aryl)acenaphthenequinone diimines as catalysts for aminocarbonylation reactions in water.

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Rok wydania

2016

Czasopismo

Journal of Molecular Catalysis A-Chemical

Numer woluminu

425

Strony

322-331

DOI

10.1016/j.molcata.2016.10.025

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Aminocarbonylation of aryl iodides with aromatic and aliphatic amines, leading to formation of the corresponding amides, was efficiently carried out in water under 1 atm of CO using palladium nanoparticles (Pd NPs) formed in situ from [PdCl2(Ar2-BIAN)] complexes. The role of Ar2-BIAN ligands in the stabilization of Pd NPs was evidenced. The nature of the catalytically active species was confirmed by poisoning experiments, which highlighted that the catalyst is actually in the form of Pd NPs rather than soluble palladium complexes. In the aminocarbonylation of iodobenzene with substituted anilines good yields of amides were obtained, although the activity was depleted by the presence of substituents in the ortho positions of the aniline. On the other hand, in the reaction with aliphatic amines α-ketoamides were formed in addition to the amides. The selectivity towards α-ketoamides was increased by increasing the CO pressure to 10 atm, at equimolar amounts of PhI and amine. Pd NPs were successfully recovered after the catalytic reaction and recycled in five subsequent runs with only a marginal loss of activity after the fourth cycle.

Słowa kluczowe

palladium, α-diimines, Aminocarbonylation, Aqueous medium, α-ketoamides

Adres publiczny

http://dx.doi.org/10.1016/j.molcata.2016.10.025

Strona internetowa wydawcy

http://www.elsevier.com