

Rh(0) nanoparticles : synthesis, structure and catalytic application in Suzuki-Miyaura reaction and hydrogenation of benzene.

Autorzy

Andrzej Gniewek

Anna M. Trzeciak

Rok wydania

2013

Czasopismo

Topics in Catalysis

Numer woluminu

56

Strony

1239-1245

DOI

10.1007/s11244-013-0090-6

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Rhodium colloids have been prepared by chemical reduction of an aqueous solution of rhodium trichloride with different aliphatic alcohols (from methanol to pentanol) in the presence of polyvinylpyrrolidone (PVP) as the stabilizing agent. The obtained Rh(0) nanoparticles have been characterized structurally by means of X-ray powder diffraction, scanning electron microscopy and transmission electron microscopy. Catalytic activity of the synthesized Rh/PVP colloids has been evidenced in the Suzuki–Miyaura coupling reaction of phenylboronic acid with bromobenzaldehyde. The choice of the reducing agent and reduction conditions enabled to obtain Rh(0) colloids showing various mean nanoparticle diameters (ranging from 3.8 to 6.0 nm) and different nanoparticle morphologies. These two factors play the decisive role from point of view of catalytic activity of the presented systems. The most active Rh/PVP catalyst, prepared using ethanol as the reducing agent, have also been applied in hydrogenation of benzene to cyclohexane, showing very high activity in this process.

Słowa kluczowe

Suzuki–Miyaura reaction, Hydrogenation, Rhodium, Nanoparticles, Catalysis

Licencja otwartego dostępu

CC-BY

Licencja na prawach której można swobodnie kopiować, rozprowadzać, zmieniać i remiksować objęty prawem autorskim utwór (Utwór-przedmiot prawa autorskiego) pod warunkiem podania imienia i nazwiska autora utworu pierwotnego oraz źródła pochodzenia utworu.

Pełny tekst licencji:

<https://creativecommons.org/licenses/by/3.0/pl/legalcode>

Adres publiczny

<http://dx.doi.org/10.1007/s11244-013-0090-6>

Strona internetowa wydawcy

<http://link.springer.com>