OMICS Group Conferences
Accelerating Scientific Discovery

World Congress on
Petrochemistry and Chemical Engineering

November 18-20, 2013 Hilton San Antonio Airport, TX, USA

Monodisperse gold nanoparticles supported on rice husk silica for heterogeneous catalysis applications

Luyi Sun, Yan Li, Davontae L. Habbit, Haoran Chen, Jingjing Liu and Raheim R. Turner
Texas State University-San Marcos, USA

Gold nanoparticles (Au NPs) based catalysts have received more and more attentions in the past two decades because of their unique catalytic properties in many important industrial processes. Both the experimental findings and theoretical predictions have demonstrated that the size of Au NPs plays a critical role in governing the catalytic activity. Smaller Au NPs typically exhibit higher catalytic activity. Herein, we report a facile method to synthesize Au NPs based heterogeneous catalyst using silica prepared from rice husks (RHs) as a support. Although silica supported Au NPs have been extensively studied, the silica supports are typically synthesized from TEOS via a sol-gel process. Notably, in this study, silica from RHs was first used as the silica source. The silica nanoparticles obtained by calcining HCl treated RHs, which possess a very rough surface, was first modified by (3-aminopropyl)triethoxysilane (APTES), which was designed to play a dual role: one was to absorb Au precursor ($AuCl4^-$) to silica surface and the other was to stabilize the resultant Au NPs obtained by reducing $AuCl4^-$ using sodium borohydride (NaBH4). Characterizations of the nanostructures revealed that the Au NPs were formed with narrow size distribution around 2-5 nm, which was very critical for essential catalytic activities. The RH supported Au NPs exhibited excellent catalytic activity for the reduction of 4-nitrophenol by $NaBH_4$.

Biography

Luyi Sun is an Assistant Professor at Texas State University-San Marcos. He received his Ph.D. degree in chemistry at The University of Alabama. He has published more than sixty peer-reviewed journal articles. He is the inventor/co-inventor of twenty nine issued/pending patents.

ls62@txstate.edu