

Accepted Manuscript

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PII: S0926-3373(15)30097-7
DOI: <http://dx.doi.org/doi:10.1016/j.apcatb.2015.08.024>
Reference: APCATB 14222

To appear in: *Applied Catalysis B: Environmental*

Received date: 27-5-2015
Revised date: 31-7-2015
Accepted date: 12-8-2015

Please cite this article as: Filippo Bossola, Claudio Evangelisti, Mattia Allieta, Rinaldo Psaro, Sandro Recchia, Vladimiro Dal Santo, Well-formed, size-controlled ruthenium nanoparticles active and stable for acetic acid steam reforming, *Applied Catalysis B, Environmental* <http://dx.doi.org/10.1016/j.apcatb.2015.08.024>

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**Well-formed, size-controlled ruthenium nanoparticles
active and stable for acetic acid steam reforming.**

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Graphical abstract

Highlights

- Ru SCMNPs are easily prepared by H₂-reduction of metal chlorides in presence of TOA.
- SCMNPs derived Ru catalysts showed good performances in acetic acid steam reforming.
- Well-formed Ru nanoparticles limit coke deposition.

Abstract

Mg(Al)O supported Ru and Rh catalysts with low loading of active metal (0.5 wt.%) were tested in the steam reforming (SR) of acetic acid (AA) to hydrogen rich mixtures. Two synthetic procedures were adopted to deposit metal nanoparticles on support material: conventional impregnation from metal chlorides aqueous solutions and Size-Controlled Metal Nanoparticles (SCMNPs) deposition method. SCMNP derived Ru catalysts showed good performances fully comparable to standard Rh

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