11th Spanish-Italian Symposium on Organic Chemistry

SISOC XI

Società Chimica Italiana-Real Sociedad Española de Química

Donostia-San Sebastián, July 13-15, 2016
FICE Building, University of the Basque Country UPV/EHU

_____

BOOK OF ABSTRACTS

OC-27

Halloysite Nanotubes as Support for Metal-Based Catalysts

Marina Massaro,[a] Giuseppe Cavallaro,[b] Carmelo G. Colletti,[a] Giuseppe Lazzara,[b] Stefana Milioto,[b] Renato Noto,[a] Filippo Parisi,[b] Serena Riela[a]

[a]*Dipartimento di Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche (STEBICEF),*
[b]*Dipartimento di Fisica e Chimica*
Università degli Studi di Palermo, Viale delle Scienze, Parco d'Orleans II, Ed. 17
e-mail: marina.massaro@unipa.it

Halloysite nanotubes (HNTs) are a natural, biocompatible, environmental friendly and cheap double-layered aluminosilicate mineral that has a predominantly hollow tubular structure. The general stoichiometry of halloysite is $Al2Si2O_5 \cdot 4(H_2O)$. The layer units consist of a tetrahedral SiOH sheet stacked with an edge shared octahedral AlO_6 sheet with an internal aluminol group AlOH. A water layer exists between the adjacent two layers.[1]

Thanks to their structural features, HNTs are suitable for a potential application as support for catalytic composites.

Recently, we reported the synthesis of novel palladium-based catalytic systems using halloysite nanotubes modified with imidazolium or triazolium moieties as supports for PdNPs and we successfully employed these supported catalysts in the Suzuki reaction under microwave irradiation.[2]

Herein we report an efficient strategy to prepare HNTs-based catalyst through direct chemical grafting with stimuli-responsive polymer (PNIPAAM) coordinating PdNPs. The HNT-PNIPAAM/PdNPs was tested as catalyst in the Suzuki reaction under microwave irradiation.[3]

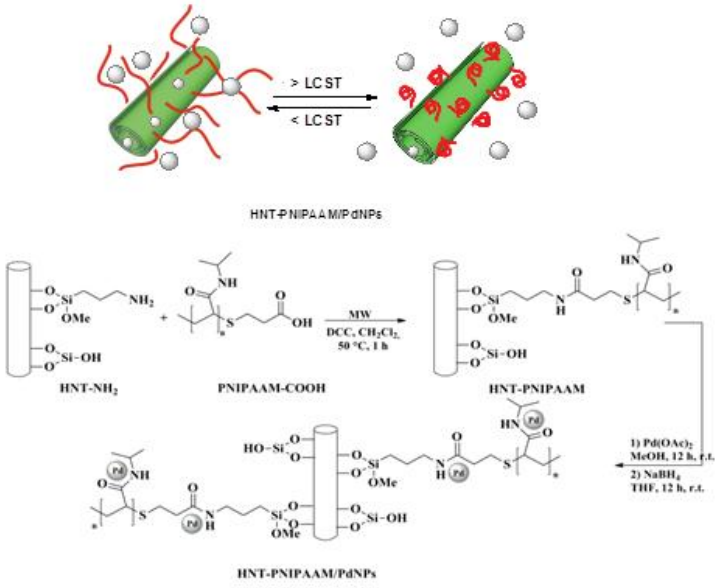

Figure 1. Schematic representation of the synthesis of HNT-PNIPAAM/PdNPs catalyst.

[1]Lvov, Y.; Wang, W.; Zhang, L.; Fakhrullin, R., Halloysite *Adv. Mater.* **2016,** *28* (6), 1227-1250.
[2](a) M. Massaro, S Riela, G. Cavallaro, M. Gruttadauria, S. Milioto, R. Noto, G. Lazzara *J. Organomet. Chem.* **2014**, *749*, 410-415; (b) M. Massaro, S Riela, G. Lazzara, M. Gruttadauria, S. Milioto, R. Noto *Appl. Organomet. Chem.* **2014**, *28*, 234-238.
[3]M. Massaro, S. Riela, G. Cavallaro, C.G. Colletti, S. Milioto, R. Noto, F. Parisi, G. *J. Mol. Catal. A* **2015**, *408*, 12-19.