

19<sup>th</sup> International Conference on

# NANOTECHNOLOGY AND EXPO

November 13-14, 2017 | Atlanta, USA

## M<sup>0</sup> nano particles (M=Au, Ag) incorporated into silica matrices as catalysts for the reductive de-halogenation of halo-acetic acids

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Efficient, green and reusable gold and silver catalysts were achieved by the incorporation of gold and silver nano-particles, M<sup>0</sup>-NPs, in organically modified silica matrices prepared via the sol-gel synthetic route. Both catalysts were applied in the reduction of mono-bromo-acetate, tri-bromo-acetate and tri-chloro-acetate by NaBH<sub>4</sub>. The two catalysts show nice effectivity towards the de-halogenation of these halo-acids. Acetic acid is obtained as the product from mono-bromo and tri-chloro-acetate, however, surprisingly succinic acid is the major product in the de-halogenation of tri-bromo-acetate. Obviously, the de-halogenation of tri-bromo-acetate occurs via a different mechanism, that facilitates the production of succinic acid. The results also point out that the relative yields of succinic acid and acetic acid depend on the rate of addition of the BH<sub>4</sub><sup>-</sup>. Slow addition of the reducing agent facilitates the production of succinic acid as the major product. The results point out that the mechanisms of the catalytic de-halogenations differ for the two metals used. It is concluded that in contrast to the accepted paradigm the mechanism of the de-halogenation of X<sub>n</sub>CH<sub>3-n</sub>-CO<sub>2</sub><sup>-</sup>, X=Cl or Br, depends on the nature of X, of M<sup>0</sup> and on the rate of addition of the reducing agent, BH<sub>4</sub><sup>-</sup>.

### Biography

Jaydeep Adhikary has completed his PhD from University of Calcutta and joined for Postdoctoral studies from Ariel University. He has published 28 papers in reputed journals till date.

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