

MarGO-Xm

Palladium decorated Graphene-doped magnetic beads for catalysis

Applications

- **Catalysis**

Immagine MarGO-Xm beads are palladium-decorated graphene magnetic beads with dimensions of about 50 μm . These beads contain small palladium nanoparticles on the surface of the graphene, obtained by a proprietary procedure. MarGO-Xm particles were tested as catalysts for the catalytic reduction of molecules by sodium borohydride. 4-Nitrophenol (4-NP), was choose as models for testing the catalytic properties of the MarGO-Xm beads.

Catalytic test with MarGO-Xm.

4-nitrophenol (4-NP) solution in 0.9 ml water, plus 100 μL 1M NaBH₄. Final concentration of 4-NP: 1mM. To this solution, 50 μL of MarGO-XM were added and the suspension was sonicated until the disappearance of the yellow colour. The reaction is complete in about 1 min.

Calculated TOF: $1 \mu\text{mol. 4-NP} / (0.05 \mu\text{mol. Pd} * 1.1 \text{ min}) = 18.2 \text{ min}^{-1}$

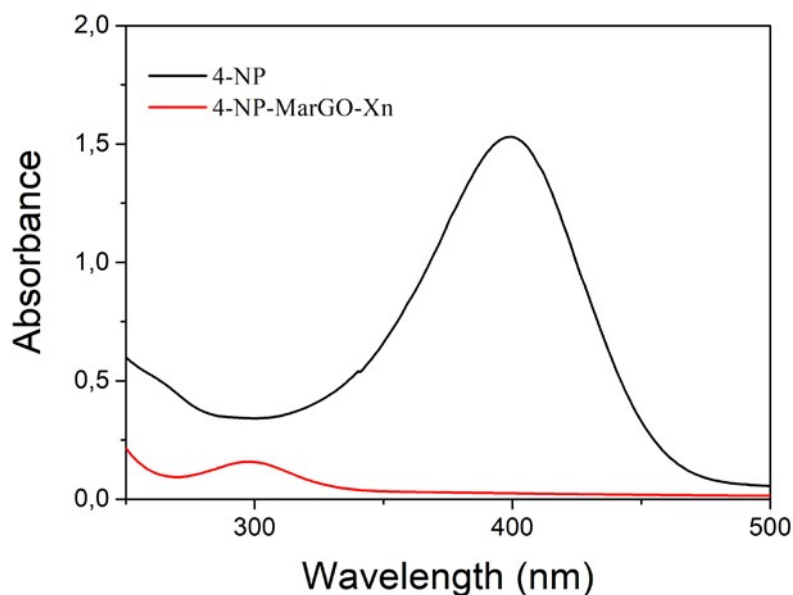


Figure 1. UV-Vis spectra of 4-NP reduction before (black) and 1 minute after the addition of the MarGO-Xm beads (red).



Protocol



- 1) Vortex the MarGO-Xm beads tube for 5 seconds
- 2) Put the required MarGO-Xm beads volume in a new 1.5 mL tube
- 3) Place the tube on the magnet to separate the beads. Remove the supernatant
- 4) Resuspend the beads in your reaction mixture
- 5) Vortex for 5 seconds
- 6) Place the tube in a sonication bath and kept it until the reaction is complete, or alternatively mix with a thermomixer (do not use magnetic stirrer)
- 6) Place the tube on the magnet to separate the beads. Remove the supernatant to collect the product.
- 7) Discard the beads

Composition: Palladium doped magnetic agarose beads

Size: 30-100 μm

Appearance: dark gel

Magnetic properties: superparamagnetic nanoparticles

Amount: 20% v/v gel

Volume: 1 ml

Formulation: Supplied in 0.1mM Sodium ascorbate solution

Storage: Store product away from direct sunlight at 4-25°C. When stored as specified the product is stable for at least six months.