

# LIGHT-RESPONSIVE LIGANDS CONTROLLING BIMETALLIC CATALYST FORMATION

Hasnaa El Saïd El Sayed, Rémi Plamont and Nathalie Katsonis

Bio-inspired and smart materials, MESA+ Institute for Nanotechnology,  
University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands

Bimetallic nanoparticles are characterized by a high catalytic activity that is attributable to the synergistic effect between the two metals that are involved<sup>1,2</sup>. Amongst other bimetallic particles, core-shell catalysts are particularly efficient because the electron charge transfer in the over layer is enhanced due to their specific architecture<sup>3,4</sup>. However, the control of the composition, the size and the shape of these core-shell nanoparticles remains challenging. Here, we propose an original supramolecular approach based on the use of spiropyran photo-responsive ligands and introduce light as an external and versatile control parameter to control the thickness of the shell. I will report on the synthesis of the photo-responsive ligands, the functionalization of palladium nanoparticles by ligand exchange, and on the formation of the core-shell systems.

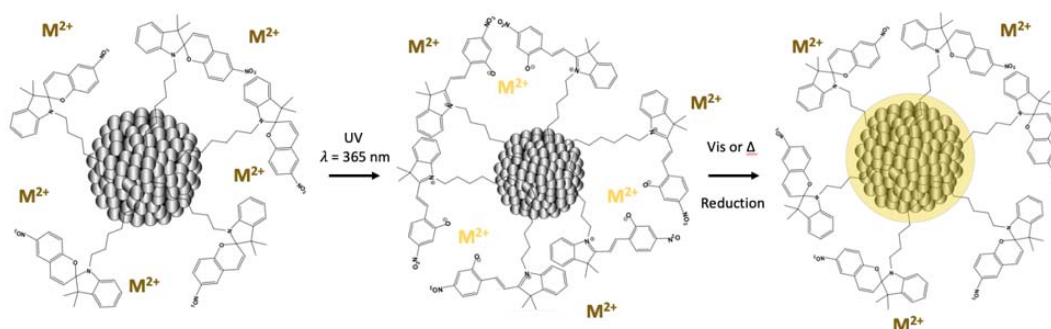


Figure 1: Representation of the synthetic procedure of bimetallic core@shell nanoparticles controlled by light-responsive ligands.

[1] R. Jain *et al.* ACS Applied Materials & Interfaces., **2018**, 10 (48), 41268–41278.

[2] H. Wang *et al.* Accounts of Chemical Research., **2013**, 46 (7), 1636–1646.

[3] Christopher J. Serpell *et al.* Nature., **2011**, 478-483.

[4] Alayoglu, S *et al* Journal of the American Chemical Society., **2008**, 130 (51), 17479–17486.