Synthesis of metal@metal core-shell nanoparticles and their catalytic applications

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Core@shell nanoparticles have been considered as good catalysts due to their high economic efficiency and catalytic properties. Because of the catalytic reaction occurs on the surface of a catalyst, we could reduce the use of expensive materials through introducing an inexpensive material as a core. In addition, core materials act as a supporting material which can enhance the catalytic activity and/or stability by formation of interconnecting area between core and shell materials. In typical seed-mediated method, we need washing process after the synthesis of core particles due to remove excess reagents in core formation stage. Shell growth reaction can be started after washing core particles by addition of anti-solvent, separation by centrifugation, re-dispersion to pure solvent, and checking the concentration of core particles in the solution. In this presentation, we reported the development of a direct seed-mediated growth method for the synthesis of metal-metal core-shell nanoparticles which do not need washing process during the reaction by fine controlling the amount of reagents in the formation of core particles.