

### A novel immobilization method for Pd nanocatalysts using polyelectrolyte multilayer adsorbed supports

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In catalysis, nanocatalysts are extensively used in industry as a catalyst due to its easily applicable for various chemical reactions and high surface to volume ratio. There are several literatures have been reported for immobilization of nanoparticles, such as simple adsorption and covalently bonding with support. However, these methods are having limits in nanocatalysts leaching after reaction and defect on catalytic active sites due to its strong covalent bonding.

In this research, we establish the method for immobilization of nanocatalysts using polyelectrolyte multilayer. Monodisperse Pd nanoparticles were synthesized, followed by modification with negative charged ligands in aqueous. Subsequently, polyelectrolyte was alternatively adsorbed on polymer resin. Surface modified Pd nanoparticles were immobilized on the PEM adsorbed polymer resin by electrostatic interaction which is likely providing with no defect on active site. The catalytic effect was demonstrated with dichromate reaction using UV-Vis spectroscopy. This method will be useful for the catalytic reactions, such as suzuki and heck coupling reactions.