

Electrocatalytic property of Pt overlayer on shape controlled Au nanoparticles

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Ultrathin Pt overlayer was deposited on shape-controlled gold nanoparticles (Pt-GNP) and exhibited unique characteristics. Different shapes of gold nanoparticles (GNP) have different facets. For example cube GNP has (100) facet, octahedral GNP has (111) facet and sphere GNP has poorly-defined surface. We have examined the effect of underlying Au surface crystalline structure on electrocatalytic activity of Pt overlayer. First we have confirmed surface crystalline structure of GNP using cyclic voltammetry method. Platinum overlayer was formed electrochemically on the surface of shaped GNP, then electrocatalytic properties of Pt-GNP were characterized through methanol oxidation reaction and oxygen reduction reaction. Also it was able to control the thickness of Pt overlayer and we have examined Pt layer thickness effect along with underlying gold facet effect.