

### Distinct Platinum Growth Mode on Shape controlled Gold Nanocrystals

양성은, 한정우, 김청희, 박나영<sup>1</sup>, 이승철<sup>1</sup>, 이현주\*  
연세대학교; <sup>1</sup>한국과학기술연구원  
(azhyun@yonsei.ac.kr\*)

Depositing ultralow amount of Pt to reduce Pt usage is an important issue in various areas. Underpotential deposition (UPD) of Cu on Au and galvanic exchange of as deposited Cu to Pt is easy and simple method to deposit ultralow amount of Pt on Au surface. Although there are already many researches going on using UPD method, they usually lack of investigating precise structure of deposited Pt. We have observed distinct Pt growth mode on different shapes of gold nanocrystals (GNC). Different shapes of GNC have different surface crystalline structure. Cube GNC has (100) facet and octahedral GNC has (111) facet. While Pt on cube GNC showed particle growth, Pt on octahedral GNC showed layer by layer growth. Distinct growth mode of Pt was examined through HR-TEM. By using DFT calculation we have confirmed that Pt on Au (111) surface was more stable as monolayer rather than particle while Pt on Au(100) surface was more stable as particle rather than monolayer. Also more positively shifted CO stripping peak of Pt on Au (100) surface revealed particle growth of Pt on Au(100) surface.