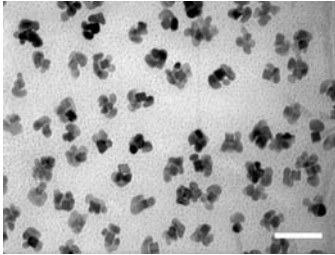


Localized Pd Overgrowth on Pt Cubic Nanocrystals for Enhanced Electrocatalytic Oxidation of Formic Acid

이현주*

연세대학교 화공생명공학과

(azhyun@yonsei.ac.kr*)



Single crystal surface studies have shown that the surface structure of catalysts plays a crucial role for both activity and selectivity. Expanding from single-metal catalysts, multi-metallic catalysts have often been reported to be more efficient with less poisoning. The catalytic properties change when another metal is adsorbed on a certain single crystalline surface, and this effect has been actively studied for electrocatalysis.

Clavilier et al. observed that the presence of adsorbed palladium on Pt(100) decreases self-poisoning and lowers the oxidation potential considerably. Here, we present the synthesis and application of binary Pt/Pd nanoparticles in which Pd decorates the well-defined surface of Pt nanoparticles. Pt nanocubes fully bound by (100) surfaces acted as seeds for overgrowth of Pd. Overgrowth was observed at multiple points on each seed, predominantly at the corners. Electro-oxidation of formic acid performed on these binary Pt/Pd catalysts showed effects expected from the single crystal study.