Component Dependent Activity of Palladium-Copper Bimetallic Nanoparticles for Electrochemical CO_2 Reduction

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Electrochemical CO2 Reduction is the attractive a strategy of CO2 conversion into fuel. Although some noble metals show high activity toward CO2 conversion into CO, the bulk metals have high cost and high overpotential . Herein, we synthesized the small and monodisperse palladium-copper bimetallic nanoparticles and investigated the effects of metal component to CO2 reduction. Pd3Cu nanoparticles showed very high selectivity (~96%) and low overpotential toward CO production. High performance of Pd3Cu nanoparticles is caused by both geometric effect and electronic effect and it will be calculated by DFT modeling.