

## Electrocatalytic activities of ultrathin Pt/Ru layers coated on vertical gold nanorod arrays

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Gold nanorod architecture serves as a template, and electrocatalytically active metals such as Pt and Ru are systematically coated on the surface of gold with an ultrathin overlayer nature, which is mediated by Cu UPD ultrathin overlayer replacement reactions. Experimental results showing homogeneous Pt/Ru-coating on the surface of gold nanorods were obtained from electrochemical analysis and scanning electron microscopy images. With ultrathin Pt overlayers on underlying Ru layers, electrocatalytic reaction for CO adlayer on such an architecture shows that the maximum electronic interaction between Pt and Ru layers plays an important role in CO oxidation promotion effect.