

Preparation of Ordered Metal Nanoparticles Arrays for Catalytic Studies

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Heterogeneous catalysts are usually composed of 1 ~ 20 nm metal clusters supported on high-surface area supporter such as alumina or silica. It is generally observed that the catalytic activity is greatly affected by the size of metal clusters. To better understand the effect of the cluster size on the reactivity of heterogeneous catalysts, it is crucial to control the size of metal clusters. We fabricated ordered arrays of nanostructures for the study of size-selective model catalysts using porous anodized aluminum oxide (AAO) templates. The AAO templates whose pore sizes were 5 ~ 50 nm were prepared. A silver electrode was sputter-deposited on one side of the templates and nickel was electrodeposited to produce Ni/Al₂O₃ modelnanocatalysts. Thermal reaction of hydrocarbons on the model catalyst surface will be presented.