

Synergistic Effect of CuPt Bimetallic Nanoclusters and Hydroxyl Group on TiO₂ for CO₂ reduction to CH₄

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The effect of CuPt nanoclusters on TiO₂ on the production of CH₄ was investigated. Cu provides active sites for CO₂ reduction, and Pt enhances the production of CH₄ by promoting the protonation of CO, which is intermediate of CO₂. In addition, the small size of the alloy gives rise to higher CH₄ production because the CuPt nanoclusters have low coordination number. XPS analysis reveals that hydroxyl group on the surface of TiO₂ facilitates CO₂ reduction. The CO₂⁻ on the CuPt nanoclusters might react with TiOH and form COOH as an intermediate. The result implies that the co-adsorption of CO₂ onto the CuPt bimetallic nanoclusters and TiO₂ can enhance the efficiency of CO₂ reduction.