

Shape effect of Cu_2O in inverse $\text{CeO}_2/\text{Cu}_2\text{O}$ catalysts for PROX reaction

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The shape control of precious metal nanostructures such as Au and Pt has received much attention because of their potential application in the fields of information storage, catalysis, electronics and optics. But considerable attention is paid to copper and their oxides as substitute catalysts due to the cost and limited availability of precious metals. Copper with excellent catalytic property is used as catalysts in copper-ceria systems for CO-PROX (preferential oxidation) reaction. Recently, inverse model catalysts of CeO_x nanoparticles supported over Cu have shown a high catalytic performance in the CO-PROX reaction, up to the point that a CeO_2/Cu system is more active than Cu/CeO_2 . In this study, ceria was deposited on two different shapes of copper oxide nanocrystals (cubes and octahedra). The activity and selectivity of $\text{CeO}_2/\text{Cu}_2\text{O}$ catalysts with various Cu_2O shapes were evaluated for the CO-PROX reaction. This catalyst was characterized by TEM, SEM, XRD, EDX.

The PROX reaction was carried out in a quartz glass fixed-bed reactor at atmospheric pressure. The compositions of the effluent gases were measured with an on-line gas chromatograph.