Preparation and Characterization of Cu/Pt/BEA Catalyst for Low Temperature CO Oxidation

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The low temperature CO oxidation over Pt-based bimetallic catalysts was investigated. Various additives such as Ni, Cu, Pd, Ag and Au were added to the Pt/BEA catalyst by an ion-exchange method and the addition of Cu to the calcined Pt/BEA catalyst was found to remarkably improve the catalytic performance. A calcination step for the Pt/BEA before Cu ion-exchange was especially important in forming the active phases for CO oxidation. XRD results indicated that the metallic Pt was not considered to be related to the active site for CO oxidation. Moreover, interactions between Pt and Cu on the Cu/Pt*/BEA catalyst could be confirmed by CO-TPD. Pt was found to be an active component for CO oxidation, but is easily deactivated by the adsorption of CO molecules. It is thought that Cu, interacting with Pt, plays an important role in preventing the deactivation of Pt.