

A study on the characteristics of Pt/WO₃/CeO₂/ZrO₂ catalysts for catalytic reduction of NO by CO

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Various supported Pt catalysts (Pt/WO₃/CeO₂/ZrO₂; Pt/ZrO₂, Pt/CeO₂, Pt/CeZrO, Pt/WO₃/ZrO₂, and Pt/WO₃/CeZrO) were prepared and characterized, and their characteristics of catalytic reductions of NO by CO with or without oxygen were investigated. The temperature-programmed experiments showed that Pt/CeO₂ and Pt/CeZrO could be easily reduced by CO while the reduction by CO was inhibited with the introduction of WO₃ in the case of Pt/WO₃/CeZrO. NO reduction could not proceed over the oxidized catalysts, but NO reduction was possible over Pt/CeO₂ and Pt/CeZrO catalysts if reduced by CO. For NO+CO reaction without oxygen, those easily reducible catalysts (Pt/CeO₂ and Pt/CeZrO) with Ce component exhibited better catalytic performances. With excess oxygen, however, Pt/WO₃/CeZrO and Pt/WO₃/ZrO₂ catalysts exhibited higher NO conversions to N₂ and N₂O especially at a low temperature. The acidity from ZrO₂ and WO₃ in Pt/WO₃/CeO₂/ZrO₂ catalysts should play an important role on their NO conversion only in the presence of excess oxygen.