

Selective Catalytic Reduction of NO_x over Supported MnO_x Catalysts

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MnO_x supported on Al₂O₃, TiO₂, ZrO₂ and SiO₂ were prepared by a precipitation method and a wet impregnation method, and their catalytic activity for the low-temperature selective catalytic reduction (SCR) of NO_x with NH₃ in the presence of excess O₂ was examined. The activity of the catalysts prepared by a precipitation method was higher than that of catalysts prepared by an impregnation method. The activity follows in the order: MnO_x/TiO₂ ≈ MnO_x/Al₂O₃ > MnO_x/SiO₂ > MnO_x/ZrO₂. Supported MnO_x catalysts prepared by a precipitation method showed an amorphous manganese oxide phase and those prepared by an impregnation method exhibited a crystalline MnO₂ phase, respectively. This high de-NO_x activity of MnO_x supported catalyst prepared by a precipitation method at low temperature is probably due to their amorphous framework structure and the existence of residual carbon oxide species.