

Promising Substituted of Molybdenum Carbides in Applications for Catalytic Removal of NO

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The catalytic NO removal reactions were investigated using a series of Mo carbides. Mo carbides were synthesized using Mo oxide (MoO_3) and methane gas (CH_4) with different heating rates and space velocity. Various characterization techniques such as BET surface area and oxygen uptake measurements were employed to characterize different Mo carbides synthesized in this study. Depending on the preparative conditions, BET surface areas ranged from 1 m^2/gr to 28 m^2/gr and oxygen uptake values varied from 0.46 $\mu\text{mol}/\text{g}$ to 5.41 $\mu\text{mol}/\text{g}$. The Mo carbides were found to be active for NO removal reactions. Although some Mo carbide catalysts were exceeded by Pt/ Al_2O_3 catalyst, the steady state reaction activities of other Mo carbide catalysts were comparable to or even higher than that of the Pt/ Al_2O_3 catalyst. These results implied that Mo carbides could be one of the promising catalysts that might be able to replace platinum group noble metal catalysts in the NO removal reactions.