

Catalytic reduction of NO with CO over Supported Fe-Based Catalysts

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Abstract:

The catalytic activity of a series of La-Fe catalysts supported on activated carbon was studied for selective catalytic reduction of NO by CO. Increasing the amount of La in the catalyst structure causes an increase in the Fe²⁺/Fe³⁺ ratio. The results showed that by increasing the La amount in catalysts, the catalytic activity of the AC-supported catalysts was enhanced because of the synergistic interactions between surface oxygen vacancies and Fe²⁺ species in the AC-supported catalysts. Due to the high catalytic performance of MnO_x, the NO_x conversion of Mn@La₃-Fe₁/AC catalyst was improved to 92.67% at the absence of oxygen at 400 °C. The Mn promoted La₃-Fe₁/AC catalyst showed the highest NO_x conversion of 93.8% at 400 °C in the presence of 10% excess oxygen. Compared with other prepared catalysts, the Mn@La₃-Fe₁/CNT catalyst showed the highest activity due to the higher Fe²⁺/Fe³⁺, which confirmed by XPS analysis. The double exchange behavior of Mn³⁺ and Mn⁴⁺ can increase the number of SOV and increase catalytic redox properties.

Key words:

NO_x removal, Selective catalytic reduction, CO-SCR