

Effect of CO/SO₂ on oxidation of NO over Pt based catalysts for Hybrid Fast SCR Process

Irfan Muhammad Faisal, 구정희, 김상돈*
한국과학기술원
(kimsd@kaist.ac.kr*)

The effects of O₂, NO and NO₂ concentrations on oxidation of NO over platinum catalysts on different supports have been determined. The activity order for NO oxidation reaction is found to be Pt/WO₃/TiO₂ > Pt/TiO₂ anatase > Pt/TiO₂ rutile > Pt/Al₂O₃. Comparing the anatase catalyst containing WO₃ and anatase itself, the catalyst containing WO₃ exhibits the highest activity since WO₃ acts as a promoter. The oxidation conversion of NO to NO₂ increases with increasing oxygen concentration from 3 to 10%, but it levels off at higher concentrations. The conversion to NO₂ decreases with increasing NO concentration and also it decreases by an addition of NO₂ to the feed. From these observations, it can be claimed that oxidation of NO over Pt based catalysts is auto-inhibited by the reaction product of NO₂. Further experiments were performed for oxidation of CO and SO₂ and to determine their effects on NO oxidation. The NO conversion slightly decreases with increasing SO₂ concentration over the anatase catalysts but the conversion is affected more by SO₂ over the rutile catalyst. Moreover, the presence of CO provides remarkably high conversion of NO over all the catalysts tested. The NO conversion exhibits a maximum value with variation of CO concentration.