

NO oxidation over Pt based catalysts for Hybrid fast SCR process

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Different catalysts containing platinum were studied for the oxidation of NO with various concentrations of oxygen, nitrogen monoxide and nitrogen dioxide. The order of activity for oxidation reaction was found to be: Pt/WO₃/TiO₂ anatase > Pt/TiO₂ rutile > Pt/Al₂O₃. Moreover anatase and rutile has same chemistry i.e. TiO₂ but different structure. The 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 feed concentrations of NO and also decreases by the addition of NO₂ to the feed. Both these observations suggest that the oxidation of NO on Pt based catalysts is autoinhibited by the reaction product NO₂. Further experiments were performed for the oxidation of SO₂ and its effects on NO oxidation. NO conversion was slightly decreased by the effect of SO₂ over anatase catalysts but highly affected by SO₂ over rutile catalyst. On the other hand, the presence of NO showed remarkably high conversion of SO₂ over all catalysts.