

Selective reduction of NO_x by hydrogen over alumina supported Pt-Co catalysts

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There is an ongoing interest regarding the removal of nitrogen oxide emission from both mobile and stationary source, due to their negative effects on environment and on human health. Selective catalytic reduction of NO_x by different reducing agents such as ammonia or urea, hydrocarbons and hydrogen is considered as a promising de-NO_x technology. However, many problems are encountered in the use of NH₃-SCR technology, such as ammonia slip, catalyst deterioration, ash odor, fouling of air heaters and high running costs. Although intensive research has been carried out on HC-SCR in the presence of oxygen for the past decade, no major practical applications have been found. Thus, use of hydrogen as reducing agent is a reasonable alternative to other SCR techniques. When H₂ is the reducing agent, NO_x can be effectively reduced at low temperature ($T < 200^{\circ}\text{C}$). Furthermore, the combustion of H₂ in air produces water without any CO₂ formation makes it environmentally benign. The aim of this work is to test hydrogen SCR of NO at low temperatures on Pt-Co/Al₂O₃ and to investigate the influence of the reaction temperature on catalytic activity.