

Turkish Journal of Chemistry

Turkish Journal

of

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Surface Properties and Catalytic Performance of Pt/PrSrCoO₄ Catalysts for NO Reduction by CO

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Abstract: Perovskite-type Pr_{2-x}Sr_xCoO₄ mixed oxides were prepared by different calcination temperatures and were investigated by XRD, BET, TPD, TPR and XPS methods. These catalysts possess high catalytic activities towards the NO reduction by CO, and the activity of the PrSrCoO₄ catalyst prepared by calcining at 750 °C is the best among these samples. This is explained in terms of its greater oxygen vacancies and larger BET surface areas. The influence of modification by a suitable amount of Pt-doping on the surface properties and catalytic activity for NO reduction by CO was studied. The results show that the Pt-modified PrSrCoO₄ catalysts display activity significantly higher than that of the Pt-free system PrSrCoO₄. Characterization of the catalysts by XRD, TPD, TPR and XPS methods reveals that both the surface and the bulk phase of the perovskite-type PrSrCoO₄ play important roles in the catalytic activities for NO reduction by CO.

Key Words: Perovskite-type A₂BO₄, Pt/PrSrCoO₄, XPS, NO reduction by CO

Turk. J. Chem., **30**, (2006), 211-221.

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