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Catalytic Oxidation Properties and Characterization of $\text{LaSrCo}_{0.9}\text{B}'_{0.1}\text{O}_4$ ($\text{B}' = \text{Mn, Fe, Ni, Cu}$)
Mixed Oxides

Laitao LUO, Guangxin SHAO, Zhanhui DUAN
Institute of Applied Chemistry, Nanchang University,
330047 Nanchang, P. R. CHINA
e-mail: luolaitao@yahoo.com.cn

 [Keywords](#)
 [Authors](#)



chem@tubitak.gov.tr

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Abstract: Using a polyacrylamide gel method, a series of $\text{LaSrCo}_{0.9}\text{B}'_{0.1}\text{O}_4$ ($\text{B}' = \text{Mn, Fe, Ni, Cu}$) mixed oxides were prepared and their catalytic activity was studied with CO and C_3H_8 oxidations as a testing reaction. The results show that the specific effects of B' ions on CO and C_3H_8 oxidations depend on their category. In comparison to LaSrCoO_4 catalyst, the activity of $\text{LaSrCo}_{0.9}\text{Ni}_{0.1}\text{O}_4$ catalyst for CO and C_3H_8 oxidations is higher, while only lower activity is obtained for Mn, Fe or Cu-doped catalysts. The information derived from TPD, XRD and iodometry experiments shows that the increase in oxidation activity of $\text{LaSrCo}_{0.9}\text{Ni}_{0.1}\text{O}_4$ catalyst towards CO and C_3H_8 oxidation can be related to the increases in O_2 -adsorption quantity, CO_2 -desorption quantity, oxygen vacancies and lattice distortion due to the adulteration of nickel. Further investigation shows that the apparent activation energy of $\text{LaSrCo}_{0.9}\text{Ni}_{0.1}\text{O}_4$ towards CO oxidation is lower than that of LaSrCoO_4 .

Key Words: B-site adulteration, catalytic oxidation, Co-based mixed oxides, A_2BO_4

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