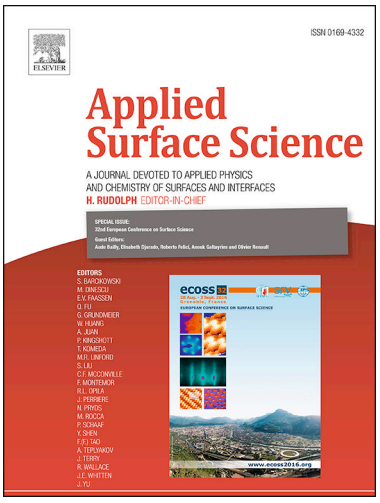

Full Length Article

Enhancing performance of Co/CeO_2 catalyst by Sr doping for catalytic combustion of toluene

Feng Xin-Yi, Guo Jia-Xiu, Wen Xin-Ru, Xu Ming-Yang, Chu Ying-Hao, Yuan Shan-Dong

PII: S0169-4332(18)30742-6
DOI: https://doi.org/10.1016/j.apsusc.2018.03.070
Reference: APSUSC 38818

To appear in: *Applied Surface Science*

Received Date: 12 January 2018
Revised Date: 3 March 2018
Accepted Date: 9 March 2018

Please cite this article as: F. Xin-Yi, G. Jia-Xiu, W. Xin-Ru, X. Ming-Yang, C. Ying-Hao, Y. Shan-Dong, Enhancing performance of Co/CeO_2 catalyst by Sr doping for catalytic combustion of toluene, *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.03.070

Enhancing performance of Co/CeO_2 catalyst by Sr doping for catalytic combustion of toluene

Feng Xin-Yi[1], Guo Jia-Xiu[1, 2*], Wen Xin-Ru[1], Xu Ming-Yang[1], Chu Ying-Hao[1, 2*], Yuan Shan-Dong[2, 3]

1. College of Architecture and Environment, Sichuan University, Chengdu 610065, Sichuan, P.R. China;

2. National Engineering Technology Research Center for Flue Gas Desulfurization, Chengdu 610065, Sichuan, P.R. China;

3. Institute of New Energy and Low Carbon Technology, Sichuan University, Chengdu 610065, Sichuan, P.R. China;

*Corresponding author: E-mail: guojiaxiu@scu.edu.cn (Guo J.-X.); chuyinghao@scu.edu.cn (Chu Y.-H.)

Abstract

Cobalt-based catalyst supported on strontium-doped ceria was prepared by impregnation method. The physical and chemical properties were investigated by various technologies and the catalytic combustion of toluene was evaluated at fixed-bed. The possible reaction process of toluene oxidation on $Co/Sr\text{-}CeO_2$ was also investigated. The results showed that Sr doping enlarges the specific surface area of CeO_2, accompanied by strong interaction between Co and Ce and high dispersion of Co oxides. Sr doping increases the lattice defects of CeO_2, which creates oxygen vacancies and enhances the oxygen mobility in $Co/Sr\text{-}CeO_2$. Sr doping also changes