

Accepted Manuscript

Title: Evolution of oxygen vacancies in MnO_x - CeO_2 mixed oxides for soot oxidation

Authors: Lin Xueting, Li Shujun, He Hui, Wu Zeng, Wu Junliang, Chen Limin, Ye Daiqi, Fu Mingli



PII: S0926-3373(17)30621-5
DOI: <http://dx.doi.org/doi:10.1016/j.apcatb.2017.06.071>
Reference: APCATB 15814

To appear in: *Applied Catalysis B: Environmental*

Received date: 30-9-2016
Revised date: 19-6-2017
Accepted date: 23-6-2017

Please cite this article as: Xueting Lin, Shujun Li, Hui He, Zeng Wu, Junliang Wu, Limin Chen, Daiqi Ye, Mingli Fu, Evolution of oxygen vacancies in MnO_x - CeO_2 mixed oxides for soot oxidation, *Applied Catalysis B, Environmental* <http://dx.doi.org/10.1016/j.apcatb.2017.06.071>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Evolution of oxygen vacancies in $\text{MnO}_x\text{-CeO}_2$ mixed oxides for soot oxidation

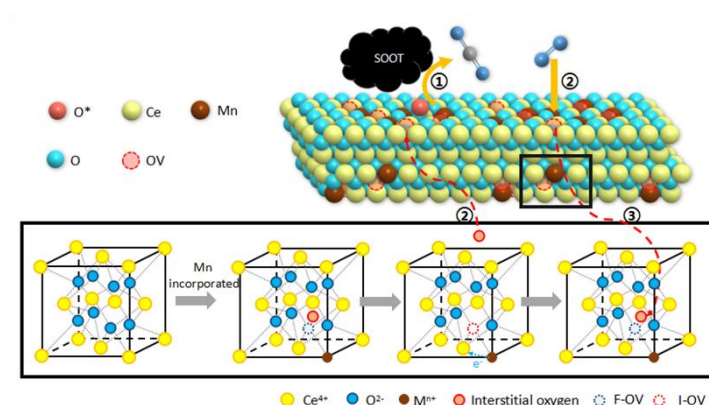
Lin. Xueting^a, Li. Shujun^a, He. Hui^a, Wu. Zeng^a, Wu. Junliang^a, Chen. Limin^a, Ye. Daiqi^{a,b,c}, Fu. Mingli^{a,b,c*}

^a School of Environment and Energy, South China University of Technology, Guangzhou 510006, China;

^b Guangdong Provincial Key Laboratory of Atmospheric Environment and Pollution Control, Guangzhou 510006, China;

^c Guangdong Provincial Engineering and Technology Research Center for Environmental Risk Prevention and Emergency Disposal, South China University of Technology, Guangzhou 510006, China

Graphical Abstract



Highlights

- Frenkel-type oxygen vacancy and intrinsic oxygen vacancy are clarified.
- The transform relation between these two types of oxygen vacancies is found.
- The evolution of oxygen vacancies in soot catalytic oxidation is proposed.

Abstracts:

Oxygen vacancy (O-vacancy) is essential in catalytic oxidation but little is known about its insight. Herein, a series of $\text{MnO}_x\text{-CeO}_2$ catalysts with various $\text{Mn}/(\text{Mn}+\text{Ce})$ molar ratios were synthesized with citric acid complex method for O-vacancy study in soot catalytic combustion. The samples were characterized by X-ray powder diffraction (XRD), N_2 adsorption/desorption, O_2 -temperature programmed desorption ($\text{O}_2\text{-TPD}$), H_2 -temperature programmed reduction ($\text{H}_2\text{-TPR}$), X-ray photoelectron spectroscopy (XPS) and in situ Raman spectroscopy. It has been shown that $\text{MnO}_x(0.4)\text{-CeO}_2$ catalyst presented more O-vacancies, thus exhibiting the highest catalytic activities and redox properties. With the utilization of in situ Raman, two types of O-vacancies, including Frenkel-type oxygen vacancy (F-OV) and intrinsic oxygen vacancy (I-OV), were clarified. Furthermore, the transform relation between F-OV and I-OV was found. Those two types of O-vacancies favored to the migration and transformation of active species, enhancing further the oxidation-

Download English Version:

<https://daneshyari.com/en/article/6498839>

Download Persian Version:

<https://daneshyari.com/article/6498839>

[Daneshyari.com](https://daneshyari.com)