

## Supplementary Information

### Oxygen vacancies promoted catalytic wet air oxidation of phenol from MnO<sub>x</sub>-CeO<sub>2</sub>

Changjian Ma,<sup>a</sup> Yaoyao Wen,<sup>a</sup> Qingqing Yue,<sup>a</sup> Anqi Li,<sup>a</sup> Jile Fu,<sup>a</sup> Nouwei Zhang,<sup>a\*</sup>  
Hengjun Gai,<sup>b</sup> Jinbao Zheng<sup>a</sup> and Bing H. Chen<sup>a\*</sup>

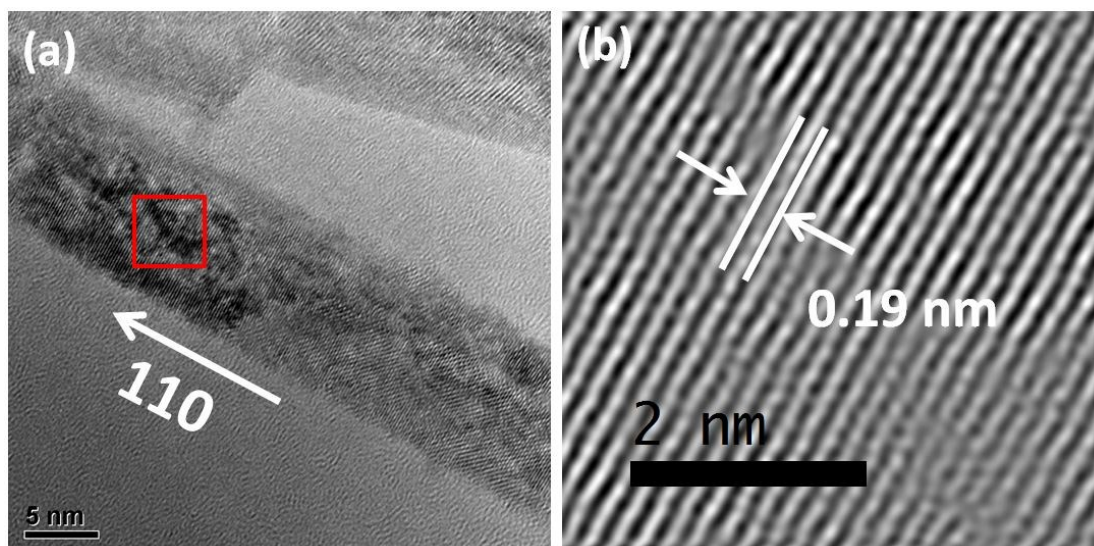
*<sup>a</sup>Department of Chemical and Biochemical Engineering, College of Chemistry and Chemical Engineering, National Engineering Laboratory for Green Chemical Productions of Alcohols-Ethers-Esters, Xiamen University, Xiamen 361005, PR China*

*<sup>b</sup>Qingdao University of Science and Technology, Shandong Qingdao 266042, China*

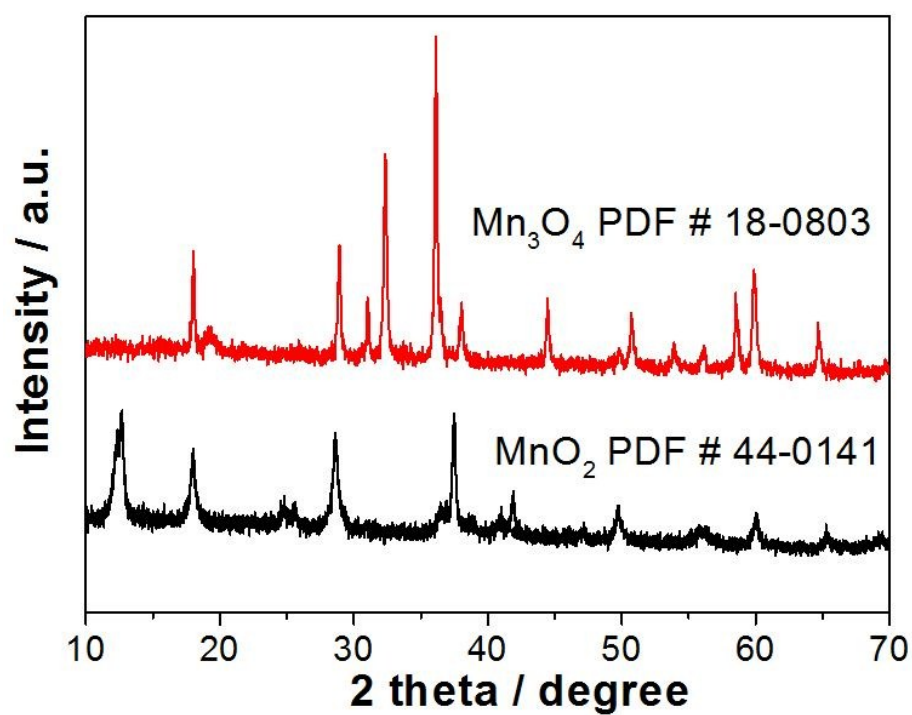
---

\*Corresponding author: Tel: +86-592-2185253

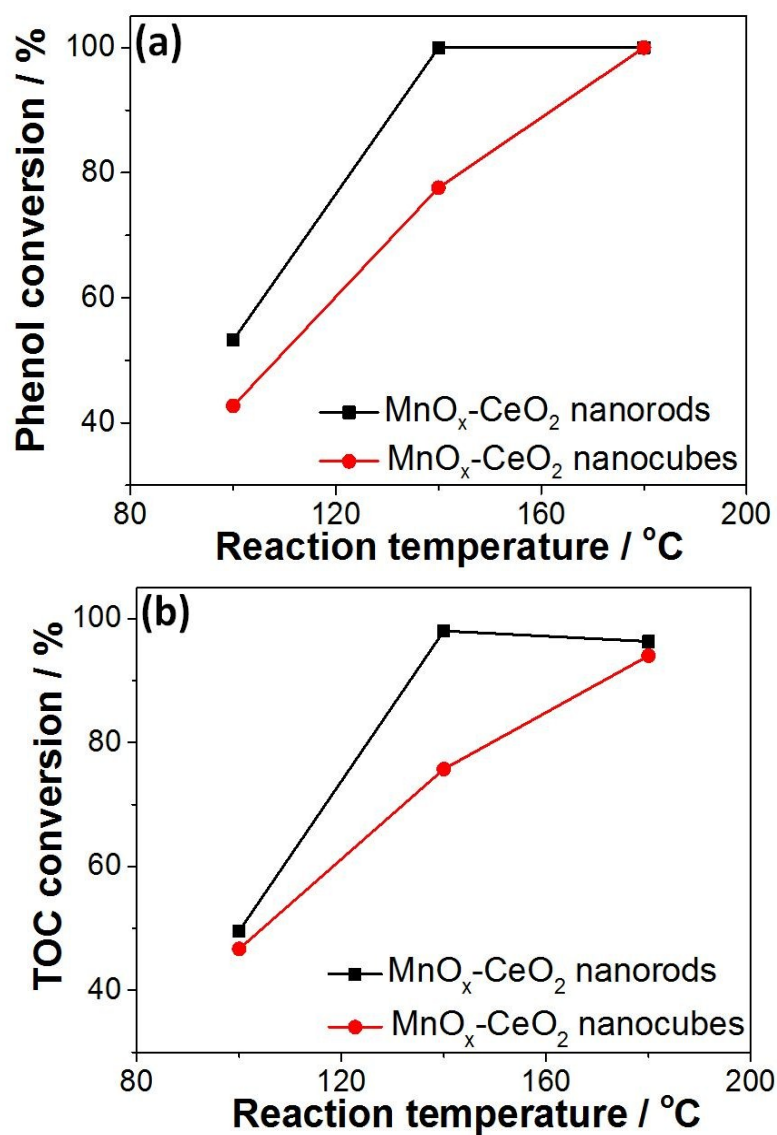
E-mail addresses: [zhnw@xmu.edu.cn](mailto:zhnw@xmu.edu.cn) (Zhang), [chenbh@xmu.edu.cn](mailto:chenbh@xmu.edu.cn) (Chen)



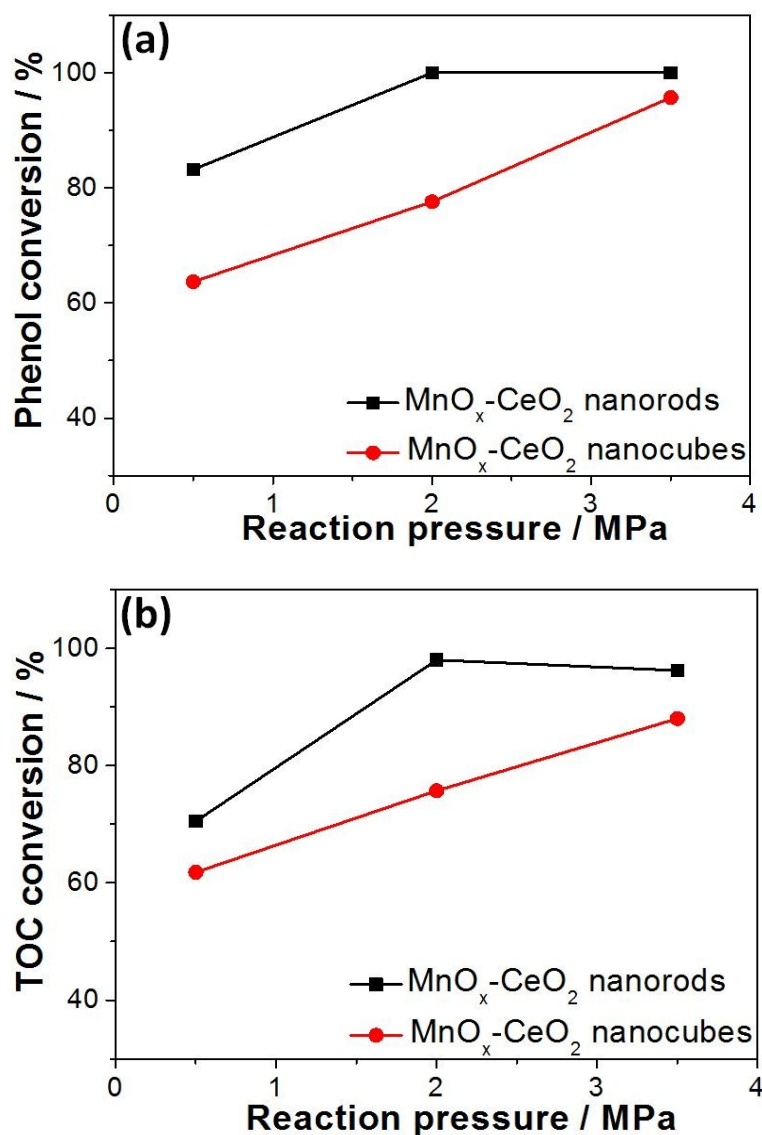
**Fig. S1** The HRTEM images of CeO<sub>2</sub> nanorods (a) and amplified image of 110 facets (b).



**Fig. S2** XRD patterns of MnO<sub>x</sub> catalysts.



**Fig. S3** Phenol (a) and TOC (b) conversions on  $\text{MnO}_x\text{-CeO}_2$  nanorods and nanocubes at various temperatures. Concentration of phenol: 1000 ppm; catalyst loading: 4 g  $\text{L}^{-1}$ ; pressure: 2.0 MPa air; time: 30 min.



**Fig. S4** Phenol (a) and TOC (b) conversions on  $\text{MnO}_x\text{-CeO}_2$  nanorods and nanocubes at various pressures. Concentration of phenol: 1000 ppm; catalyst loading: 4 g L<sup>-1</sup>; temperature: 140 °C; time: 30 min.