

Supplementary material

Precise control of surface oxygen vacancies in ZnO nanoparticles for extremely high acetone sensing response

Jihyun Lee^{1,†}, Youngmoon Choi^{2,†}, Byoung Joon Park³, Jeong Woo Han³, Hyun-Sook Lee^{1,*}, Jong Hyeok Park^{2,*}, Wooyoung Lee^{1,*}

¹Department of Materials Science and Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea

²Department of Chemical and Biological Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of Korea

³Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk 37673, Republic of Korea

[†] These authors contributed equally.

*Corresponding authors: wooyoung@yonsei.ac.kr (W. Lee), lutts@yonsei.ac.kr (J. H. ark), h-slee@yonsei.ac.kr (H.-S. Lee).

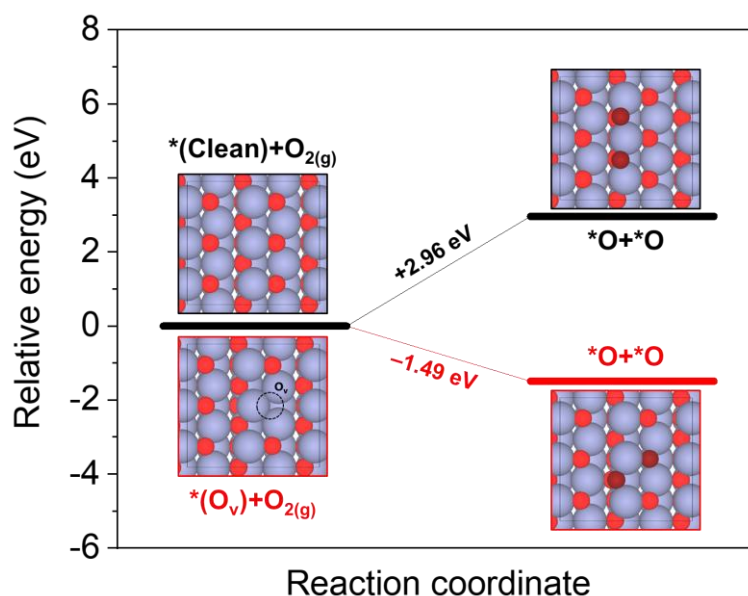


Figure S1. The dissociative adsorption energy of O₂ on clean and oxygen-vacant ZnO surfaces. A dashed circle denotes the position of the oxygen vacancy. The adsorbed O atoms dissociated from the O₂ molecules are depicted as dark-red spheres in the figure.

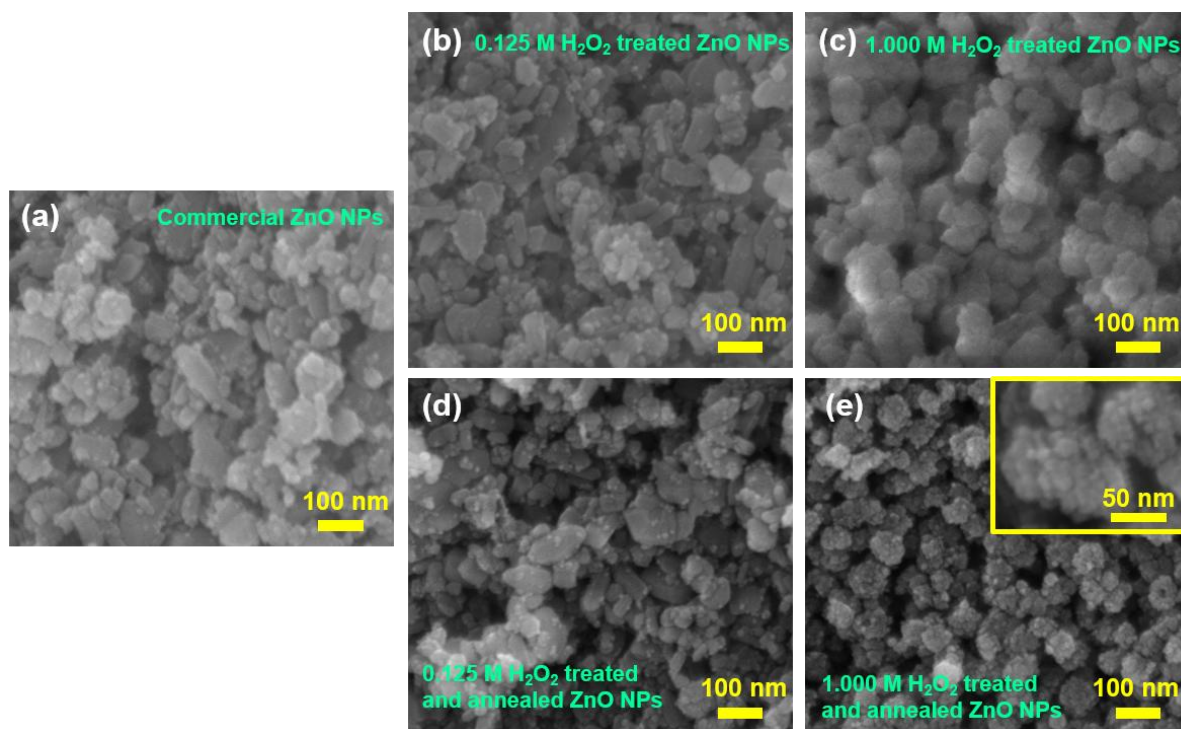


Figure S2. Scanning electron microscope (SEM) images of (a) commercial ZnO NPs and (b)-(e) x M H₂O₂ treated/annealed ZnO NPs ($x = 0.125$ and 1.000). (b), (d) ZnO NPs treated with 0.125 M of H₂O₂. (c), (e) ZnO NPs treated with 1.000 M of H₂O₂. (b) and (c) represent the NPs before annealing at 400 °C, and (d) and (e) represent the NPs after annealing at 400 °C.