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# The correlation between the surface defects and the behavior of hydrogen adsorption over ZnO under UV light irradiation

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***S1.Spectrogram of the light source used in the experiment***

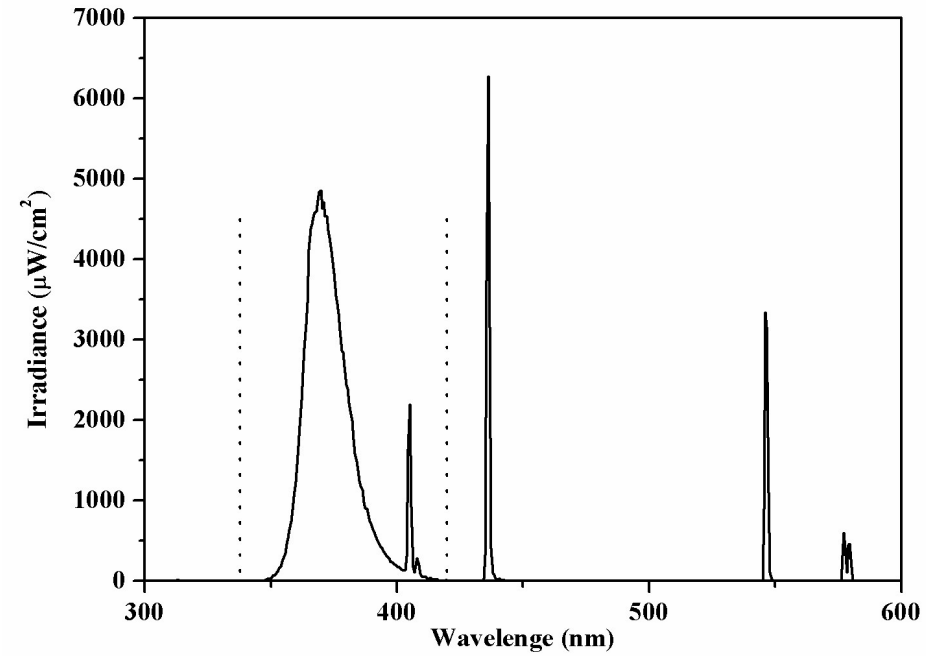


**Fig.S1** Spectrogram of the light source used in the experiment

***S2. The selected area electron diffraction pattern of Z-3-Air and Z-3-$N_2$ samples***

The existence of the various crystal planes can be confirmed by the selected area electron diffraction pattern (SAED) [a] in Fig.S2. The inset exhibited the {100}, {002}, {101}, {110}, {103} and {112} diffraction spots in selected area diffraction, indicating that these crystal planes exposed in the Z-3-Air and Z-3-$N_2$ samples. However, the SAED image could not explain the dominant growth of a certain crystal plane.

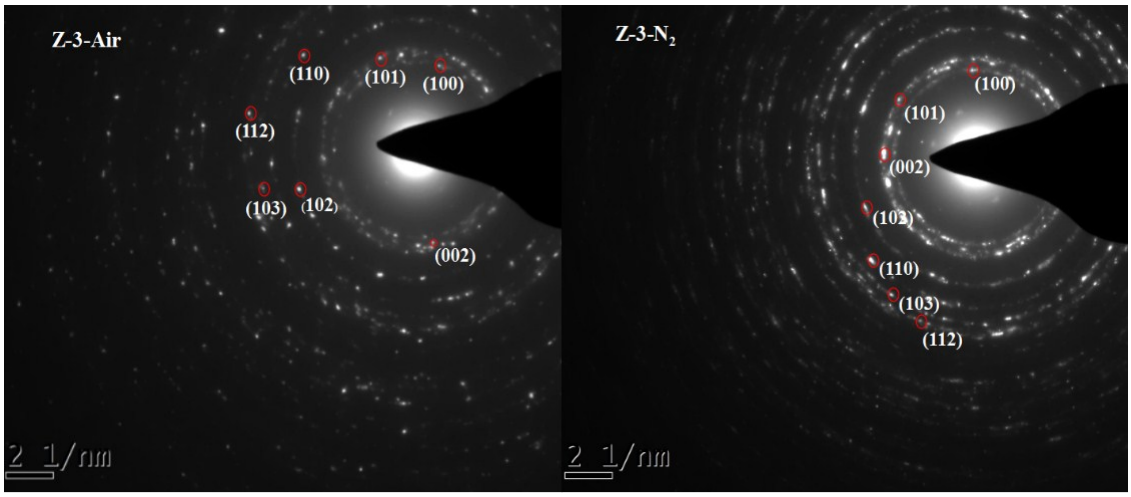


**Fig.S2** The selected area electron diffraction pattern of Z-3-Air and Z-3-$N_2$ samples

**References**

[a] H. G. Yang, C. H. Sun, S. Z. Qiao, J. Zou, G. Liu, S. C. Smith, H. M. Cheng and G. Q. Lu, Anatase $TiO_2$ single crystals with a large percentage of reactive facets, Nature, 2008, 453, 638.