

Supplementary Information

Assessing Multi-variable Coupling Effects of UV Illumination, Heat and Oxygen on Porous ZnO Nanocrystalline Film through Electron Concentration and Mobility Extraction

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Figure S1. XRD pattern of the as-prepared porous nanocrystalline ZnO film.

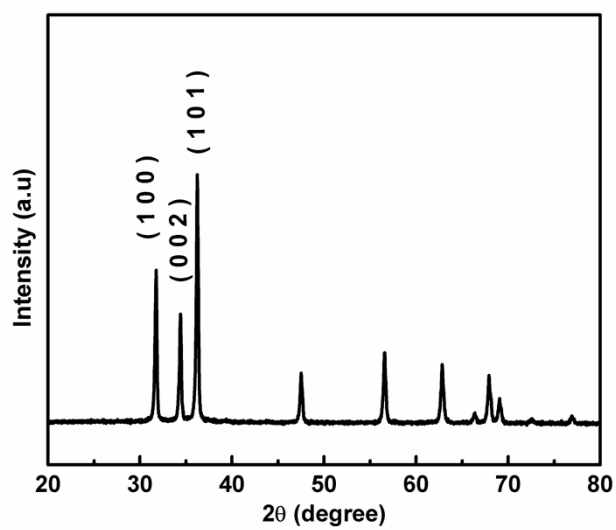


Figure S2. The fitted curves (the black dashed lines) of different oxygen concentration in the dark at low temperature (a) and at high temperature (b).

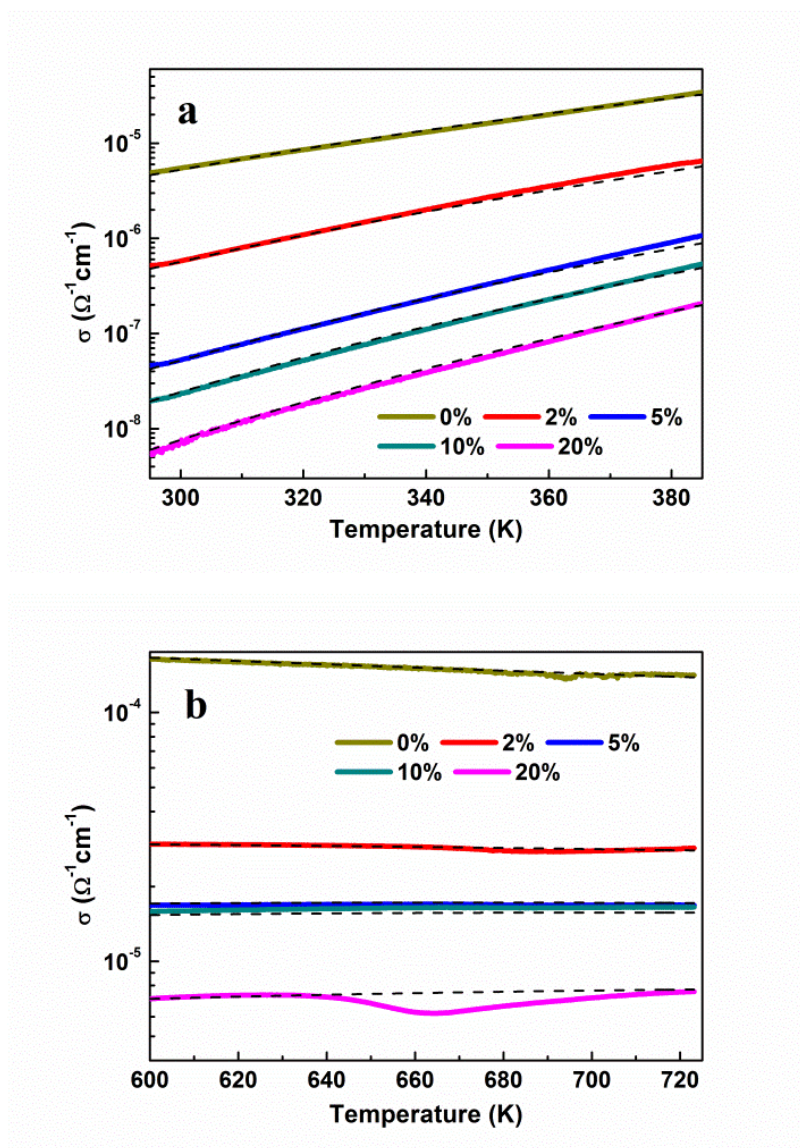


Figure S3. (a) The PL spectra of the ZnO samples under different temperature; (b) the PL spectra are deconvoluted by Gaussian fitting, and the Area IntgP of each Gaussian function is present in the insert table. The $\sim 470\text{nm}$ emission may be attributed to the transition between V_{O}^{\bullet} to VB (the valence band); the $\sim 530\text{nm}$ emission may be related to the Zn vacancy; the $\sim 590\text{nm}$ emission is believed to be originated from the $V_{\text{O}}^{\bullet\bullet}$; and the $\sim 660\text{ nm}$ emission is commonly attributed to the presence of excess oxygen.

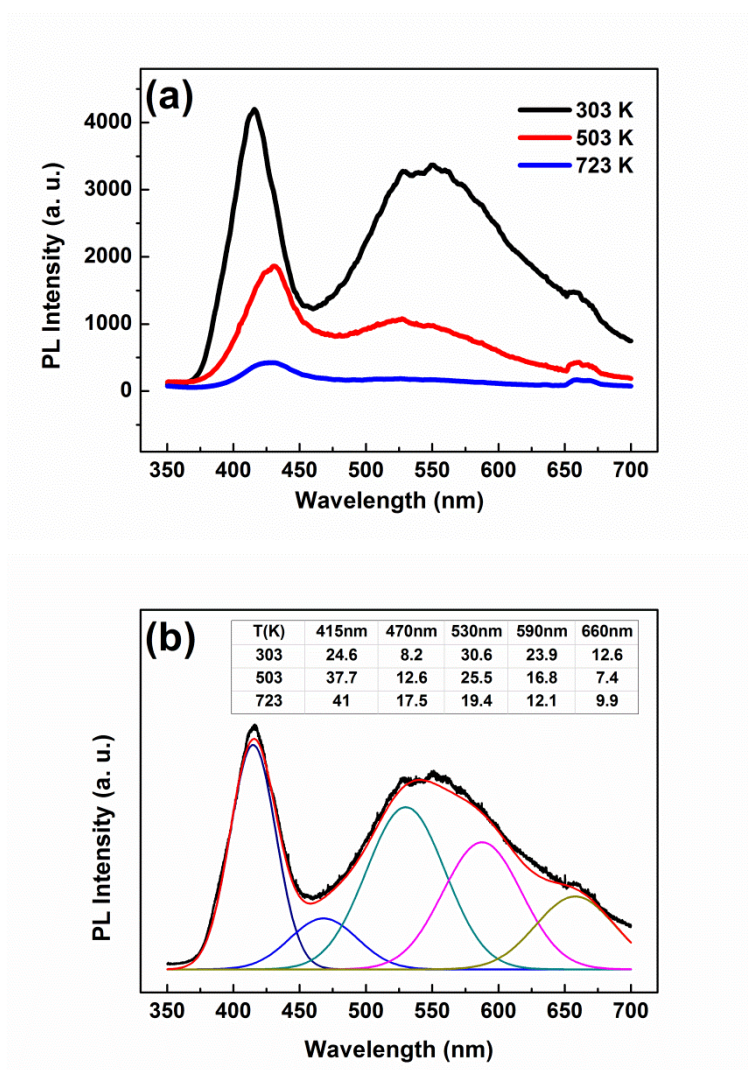


Figure S4. The fitted curves of different oxygen concentration under the UV light at low temperature (a) and at high temperature (b).

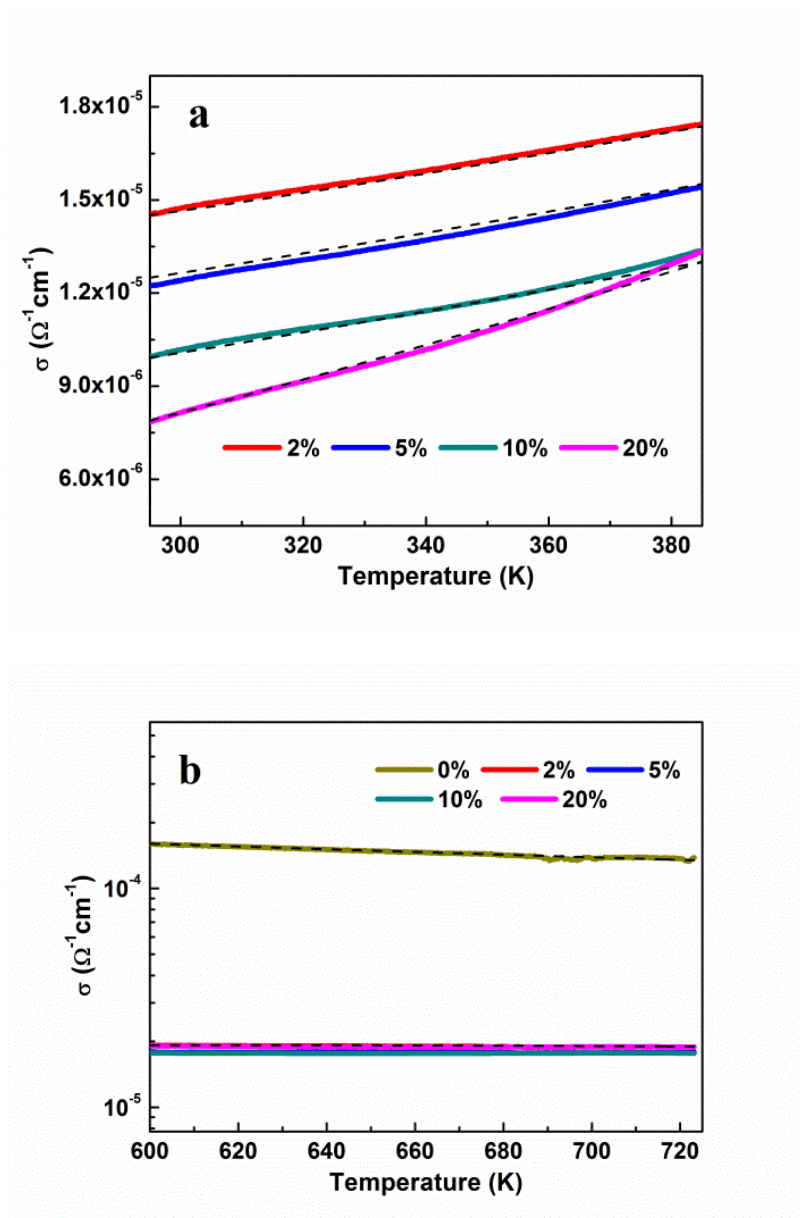


Figure S5. The dependence of σ_{UV}/σ_D on temperature under different oxygen partial pressures.

