

## Supporting Information

### **Oxygen vacancy induced self-doping effect and metalloid LSPR in non-stoichiometric tungsten suboxide synergistically contributing to the enhanced photoelectrocatalytic performance of $\text{WO}_{3-x}/\text{TiO}_{2-x}$ heterojunction**

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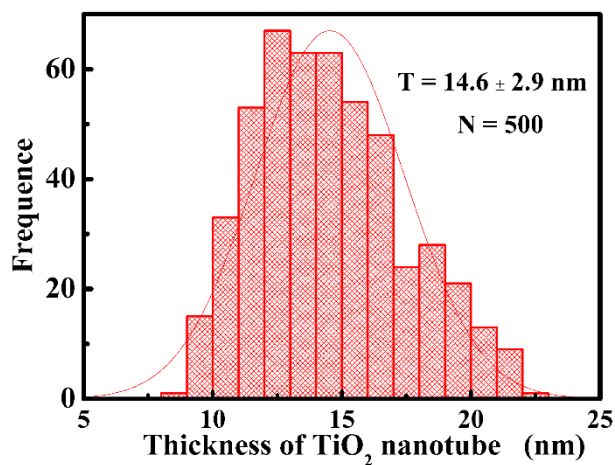


Figure S1 Thickness distribution of  $\text{TiO}_2$  nanotube wall

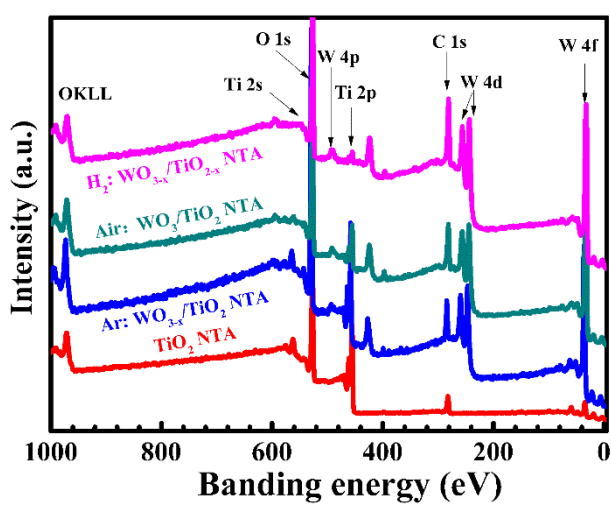


Figure S2 Full XPS spectra of samples.

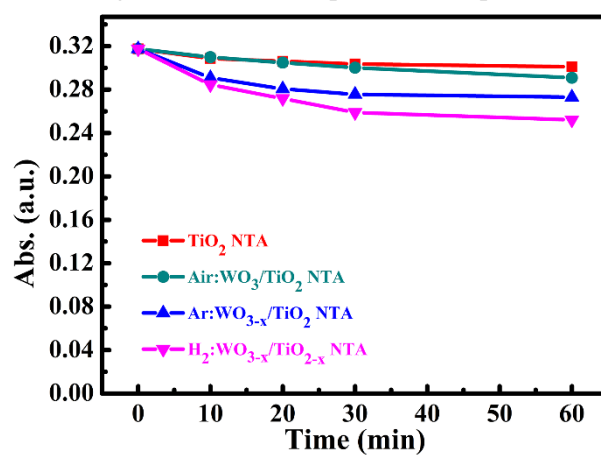


Figure S3 Dark reaction procedure before PEC degradation of MB.

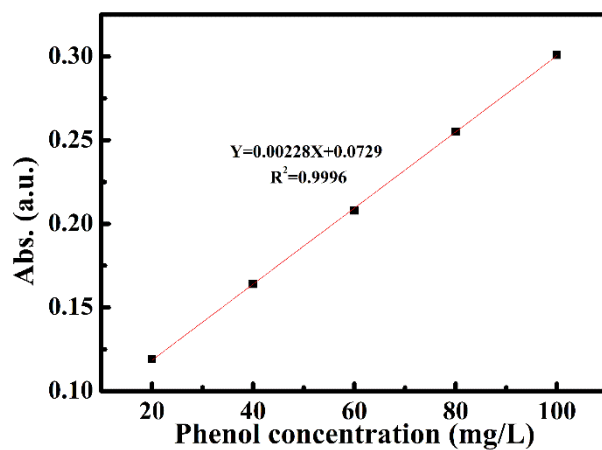


Figure S4 the light absorption (at 510 nm) of verity standard concentration of phenol solution.

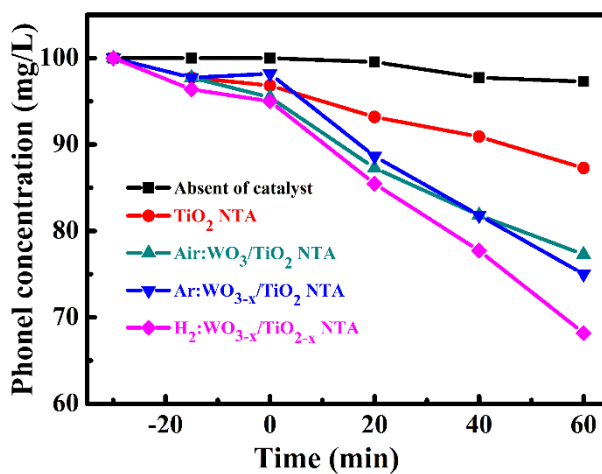


Figure S5 Phenol PEC degradation performance of samples