

Supplementary Information

Ultrasonic-induced disorder engineering on ZnO, ZrO₂, Fe₂O₃ and SnO₂ Nanocrystals

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Figures

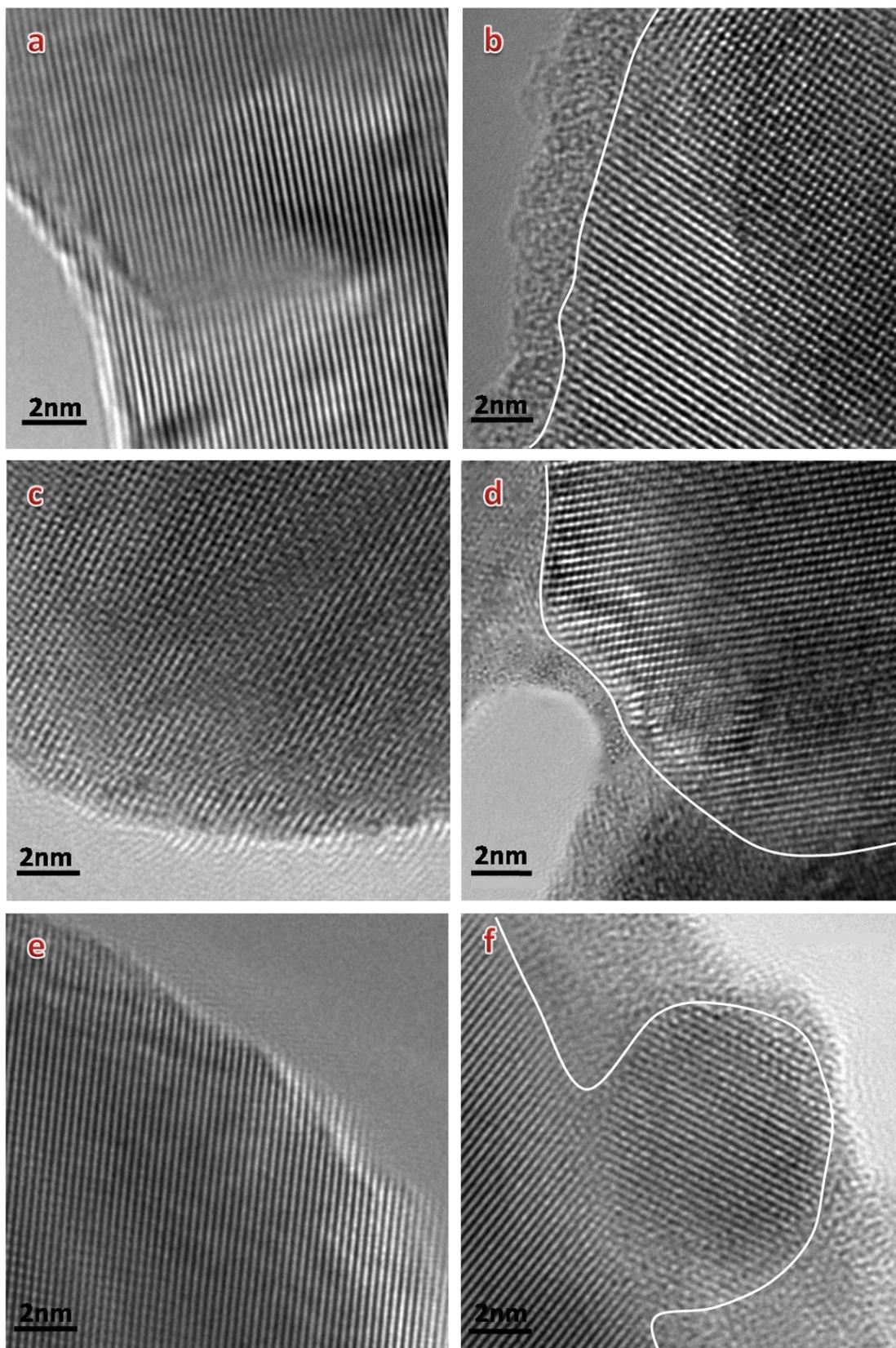


Figure S1. HRTEM images of ZnO(a), ZnO-U(b), ZrO₂(c), ZrO₂-U(d), SnO₂(e) and SnO₂-U(f). The white lines mark the boundaries of crystalline and disorder phase.

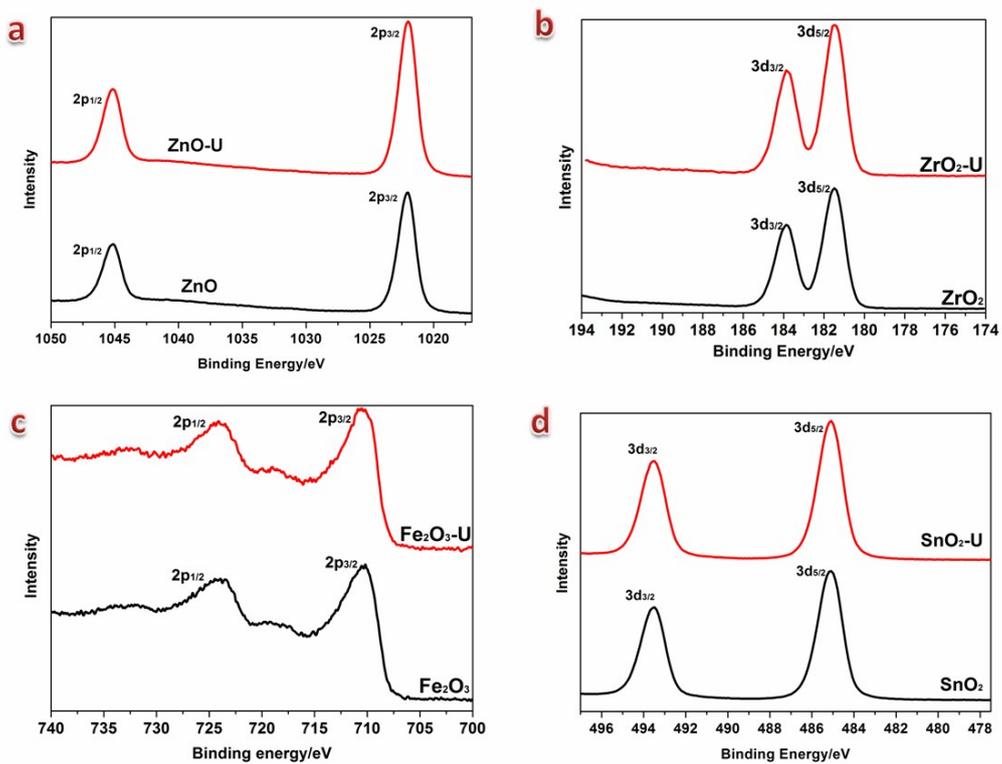


Figure S2. Zn 2p XPS spectra of ZnO and ZnO-U(a), Zr 3d XPS spectra of ZrO₂ and ZrO₂-U(b), Fe 2p XPS spectra of Fe₂O₃ and Fe₂O₃-U(c), Sn 3d XPS spectra of SnO₂ and SnO₂-U(d).

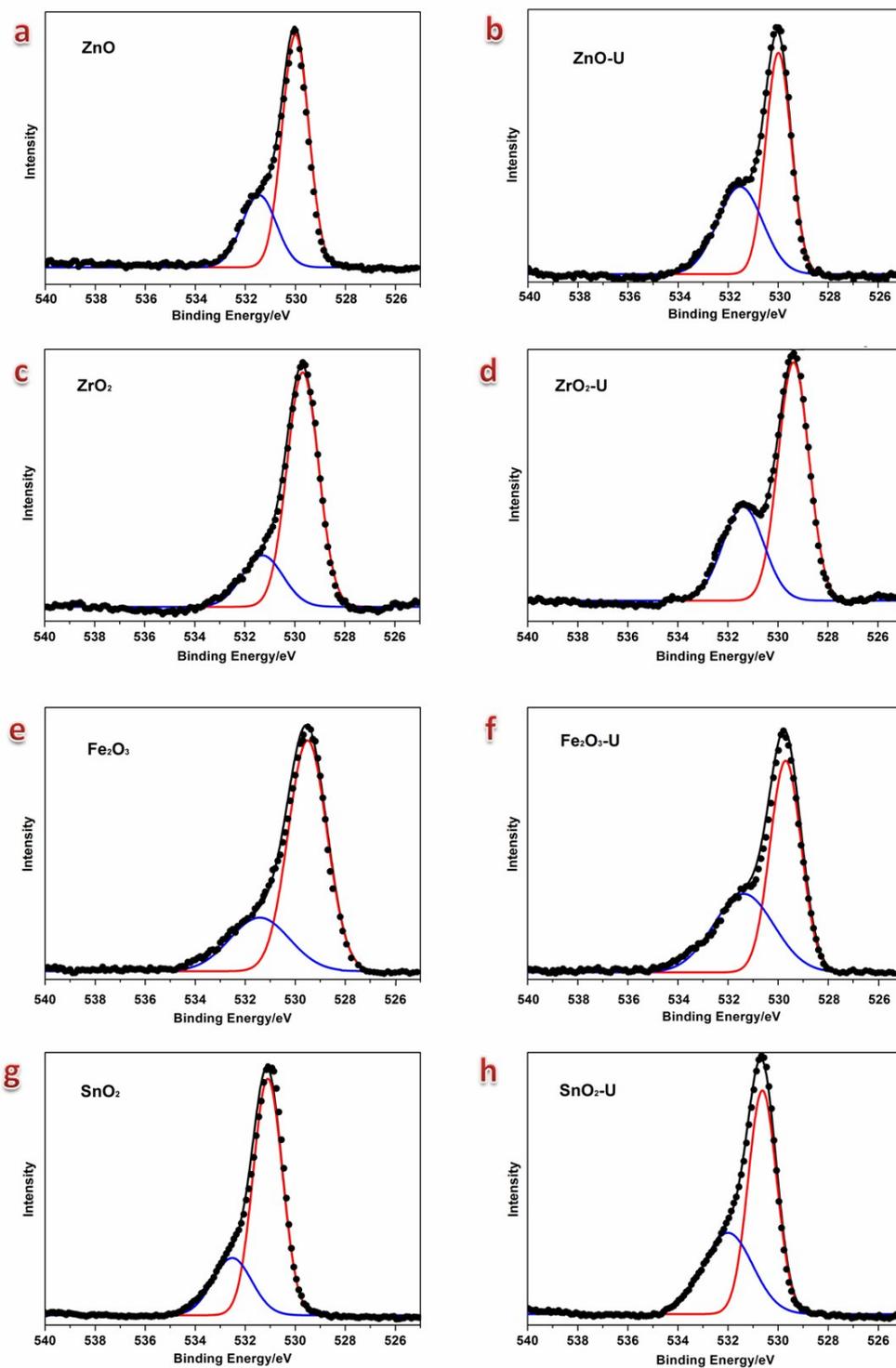


Figure S3. O 1s XPS spectra of ZnO, ZrO₂, Fe₂O₃, SnO₂ NCs and the corresponding ultrasonic treated products.

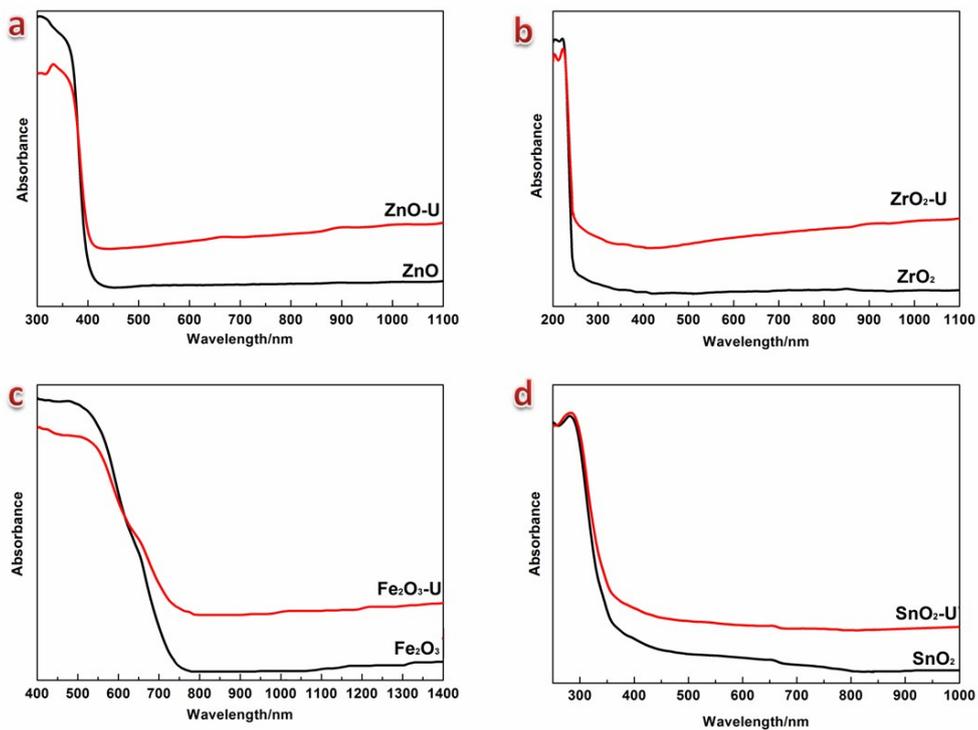


Figure S4. UV-Vis spectral absorbance of ZnO, ZrO₂, Fe₂O₃, SnO₂ NCs and the corresponding ultrasonic treated products.

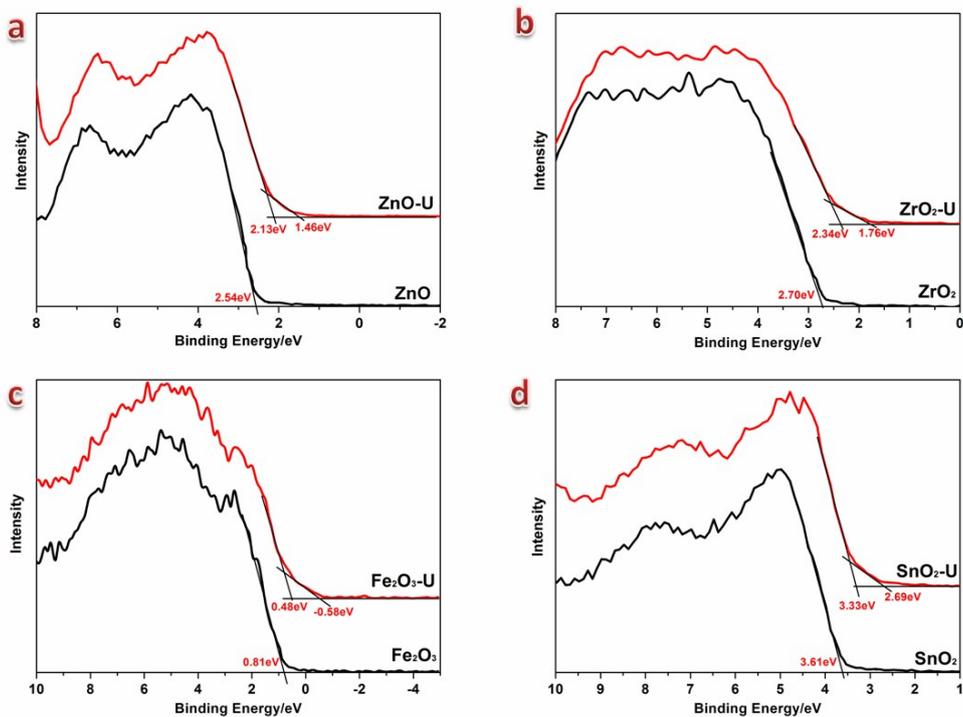


Figure S5. VB XPS spectra of ZnO, ZrO₂, Fe₂O₃, SnO₂ NCs and the corresponding ultrasonic treated products. The black lines indicate the VBM and band tail of each sample.

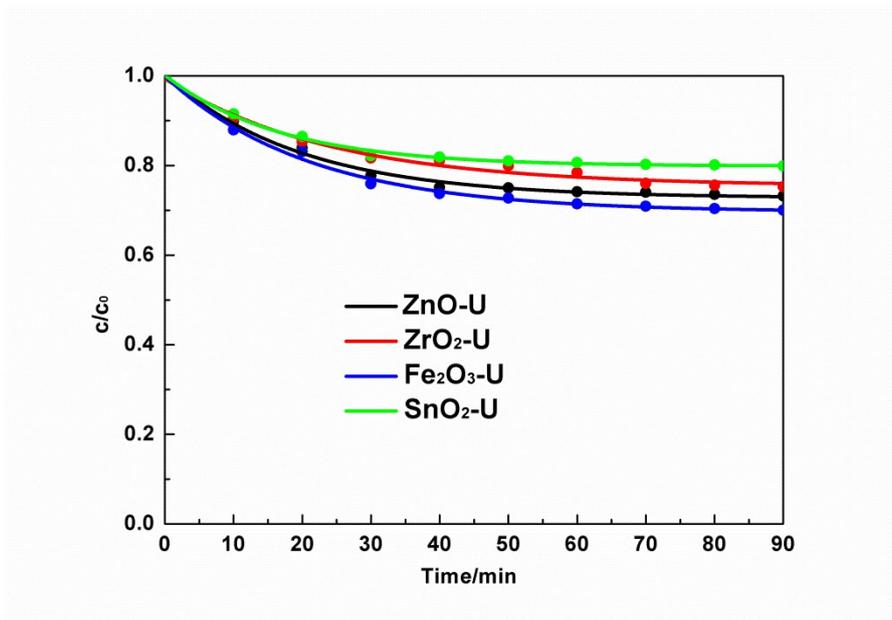


Figure S6. Evaluations of dark reaction of ZnO-U, ZrO₂-U, Fe₂O₃-U and SnO₂-U.

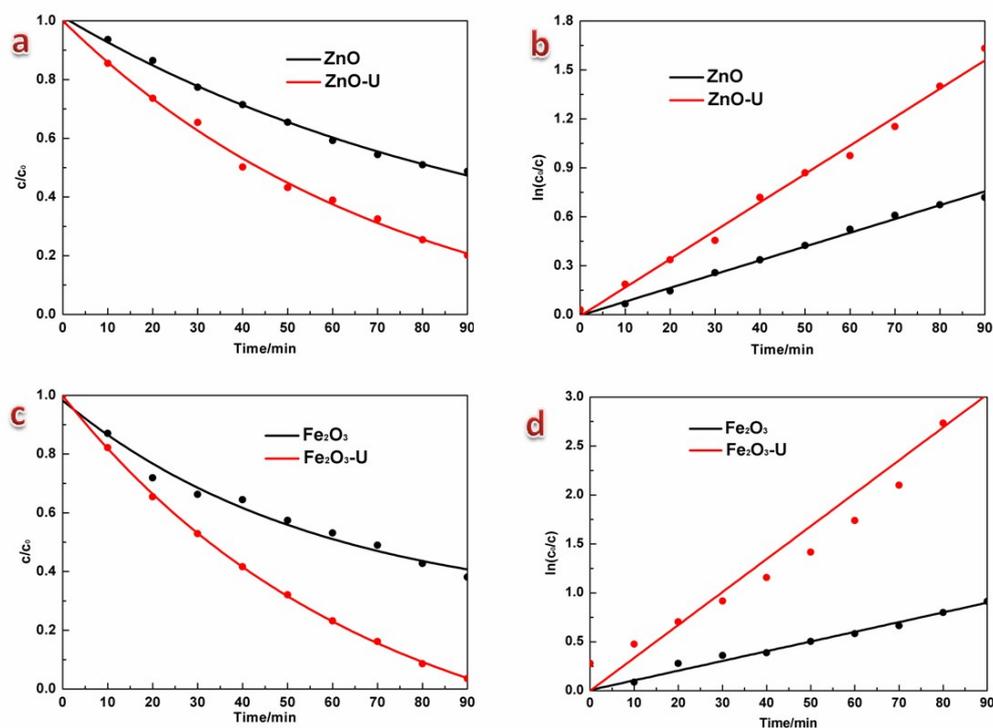


Figure S7. Evaluations of visible-light-driven photocatalytic activity (AF degradation) of ZnO, Fe₂O₃ NCs and the corresponding ultrasonic treated products.

Table S1. Kinetic constants (k_a) values of solar-driven photocatalysis for ZnO, ZrO₂, Fe₂O₃, SnO₂ NCs and the corresponding ultrasonic-treated products.

Sample	ZnO	ZnO-U	ZrO ₂	ZrO ₂ -U	Fe ₂ O ₃	Fe ₂ O ₃ -U	SnO ₂	SnO ₂ -U
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$k_a/10^{-2}s^{-1}$	8.955	11.416	0.837	1.199	7.699	11.241	2.163	3.755
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