

Supporting Information

One-Pot, Ligand-Free, Room-Temperature Synthesis of Au/Pd/ZnO Nanoclusters with Ultra-Low Noble Metals Loading and Synergistically Improved Photocatalytic Performances

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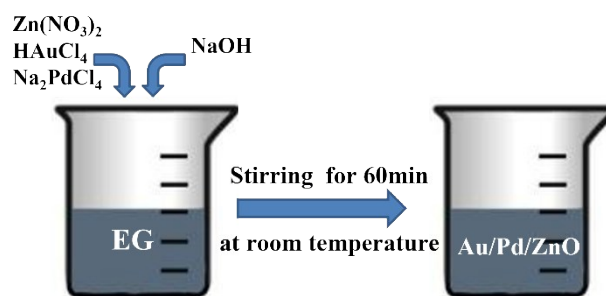


Figure S1. Schematic illustration for the synthesis of Au/Pd/ZnO nanoclusters.

Sample	Theoretical mass fraction of Au element(wt %)	Practical mass fraction of Au element(wt %)	Theoretical mass fraction of Pd element(wt %)	Practical mass fraction of Pd element(wt %)
Au/Pd/ZnO	0.15 %	0.141 %	0.05 %	0.041 %
Au/ZnO	0.20 %	0.189 %		
Pd/ZnO			0.20 %	0.158 %

Table S1. The Au/Pd/ZnO nanoclusters determined by inductively coupled plasma mass spectrometer.

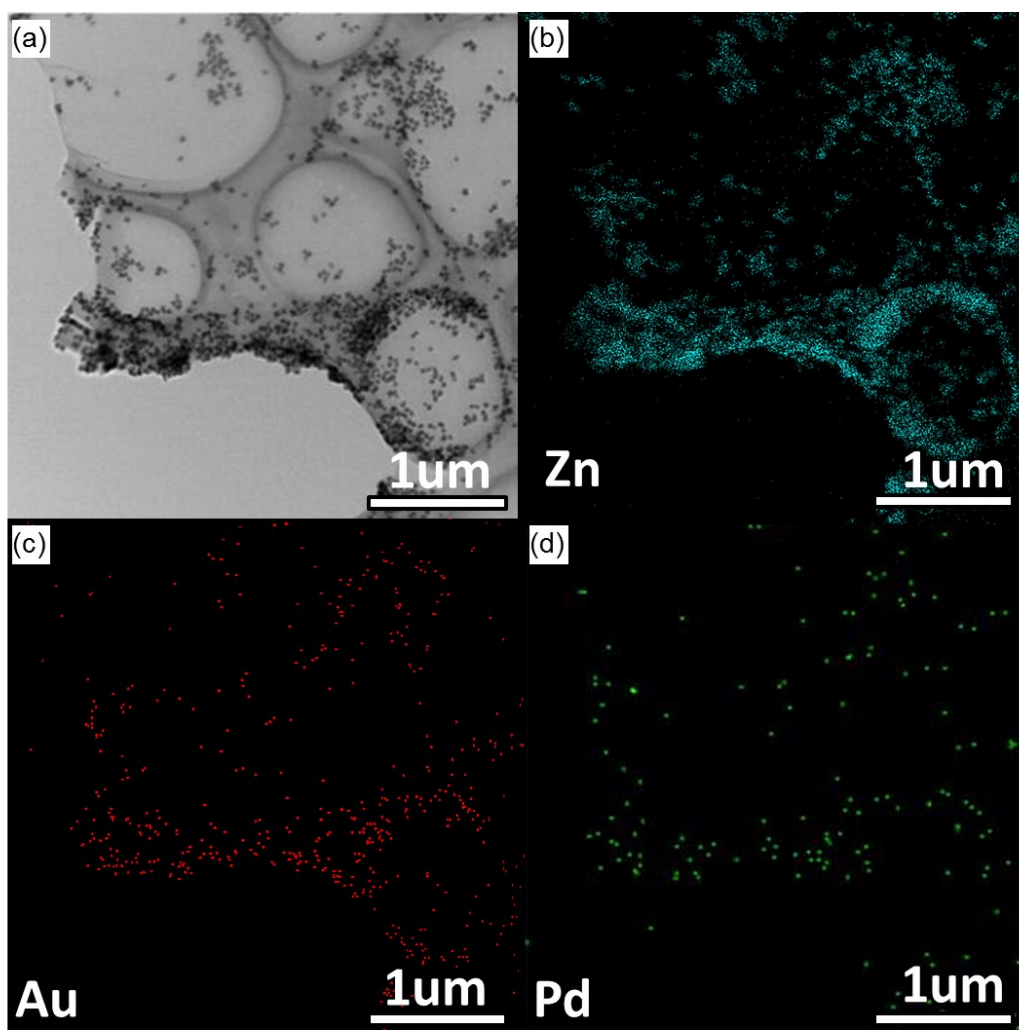


Figure S2. EDS mapping images for (b) Zn element, (c) Au element, (d) Pd element in a random selected-area shown in Figure (a).

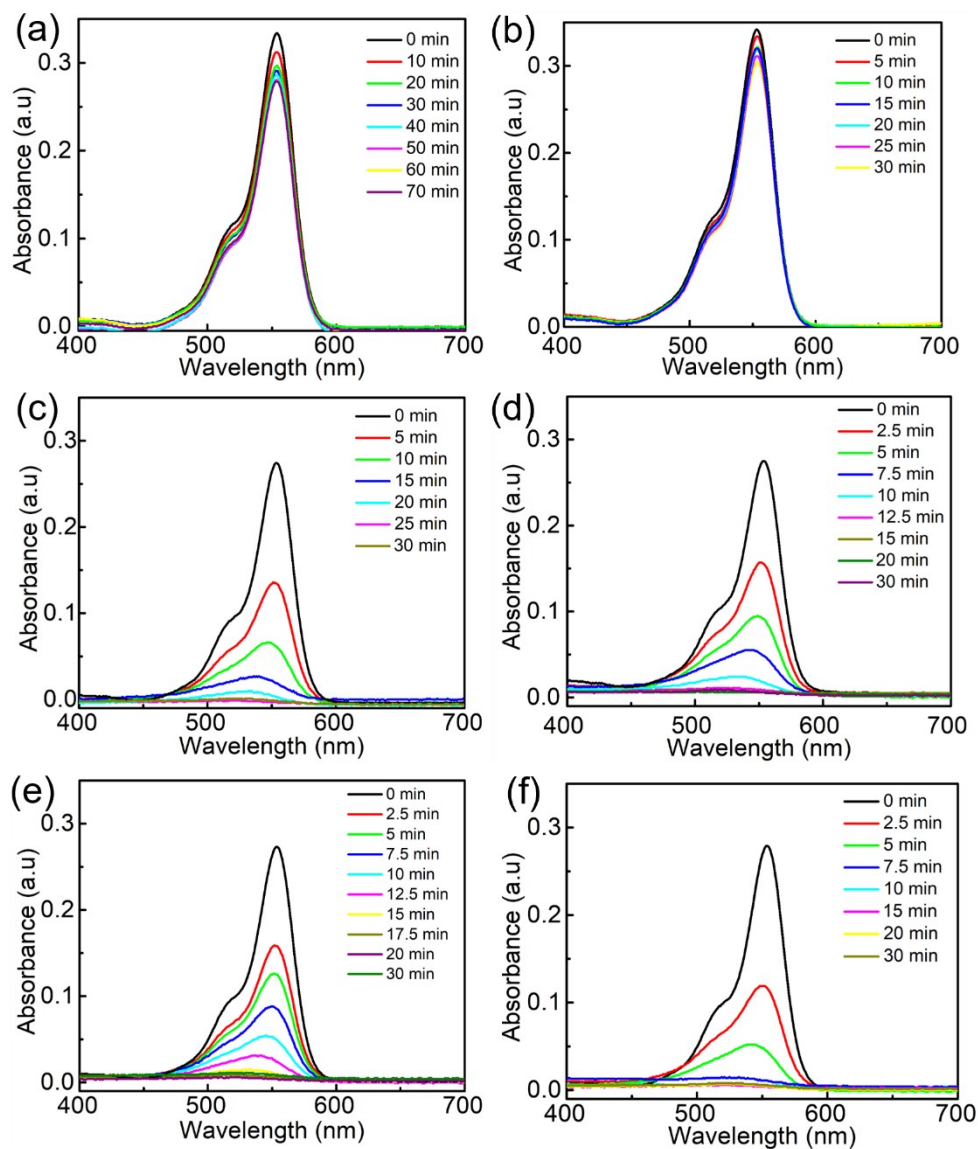


Figure S3. (a) UV-Vis spectra of RhB aqueous solution after the introduction of Au/Pd/ZnO nanoclusters in the dark condition, (b) UV-Vis spectral evolution of RhB aqueous solution only, UV-Vis spectral evolution of RhB aqueous solution in the presence of (c) ZnO, (d) Au/ZnO, (e) Pd/ZnO, and (f) Au/Pd/ZnO samples under the irradiation with a 300 W Xenon lamp at room temperature.

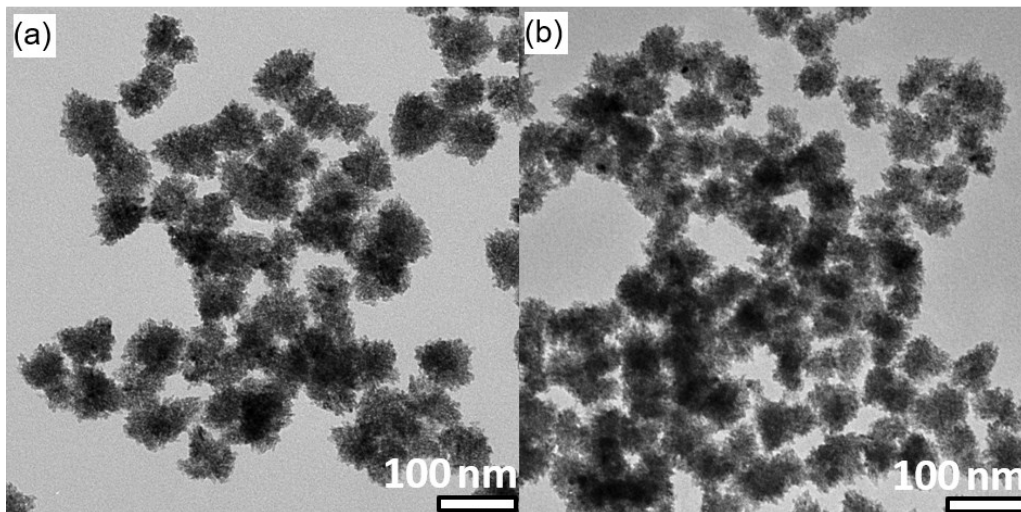


Figure S4. TEM images of (a) the as-synthesized Au/Pd/ZnO nanoclusters recovered after (a) 1 cycle and (b) 5 cycle photocatalytic reaction for organic dye RhB under the irradiation with Xenon lamp. Our results clearly showed that the size and morphology of Au/Pd/ZnO nanoclusters are well maintained after photocatalytic experiment, which ensure Au/Pd/ZnO nanoclusters always keep a high catalytic activity. All scale bars are 100 nm.

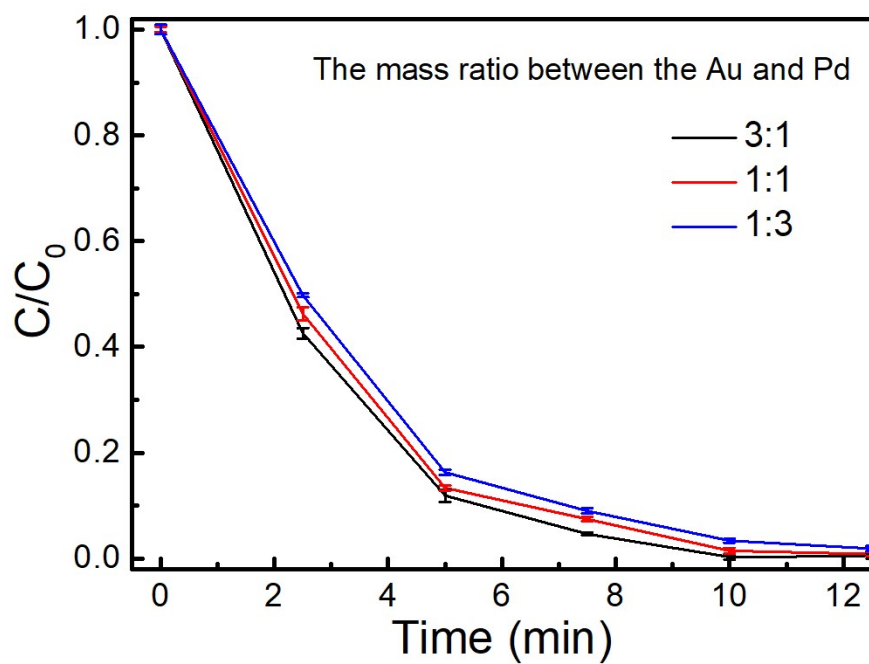


Figure S5. The photocatalytic performances (C/C_0) of the as prepared Au/Pd/ZnO samples with different mass ratio between Au and Pd for degradation of RhB under simulated solar light irradiation.

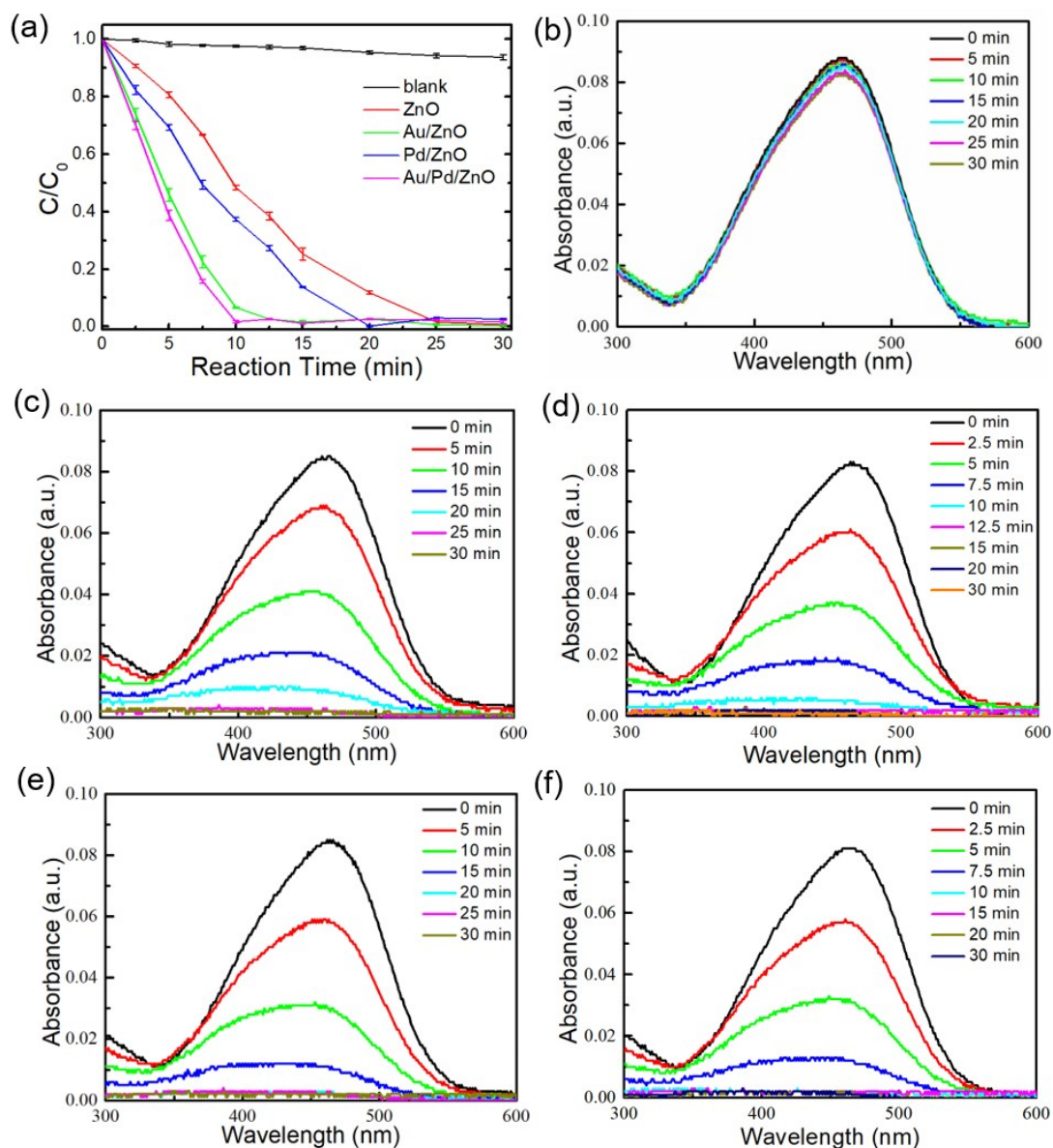


Figure S6. (a) The photocatalytic performances (C/C_0) of the as prepared ZnO, Au/ZnO, Pd/ZnO, and Au/Pd/ZnO samples for degradation of MO under simulated solar light irradiation, (b) UV-Vis spectral evolution of MO aqueous solution only, UV-Vis spectral evolution of MO aqueous solution in the presence of (c) ZnO NPs, (d) Au/ZnO NPs, (e) Pd/ZnO NPs, (f) Au/Pd/ZnO samples under the irradiation with a 300 W Xenon lamp at room temperature.