Supporting Information

for

Surface-plasmon-enhanced ultraviolet emission of Au-decorated ZnO structures for gas sensing and photocatalytic devices

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Additional spectra

I. Gas sensing characteristics

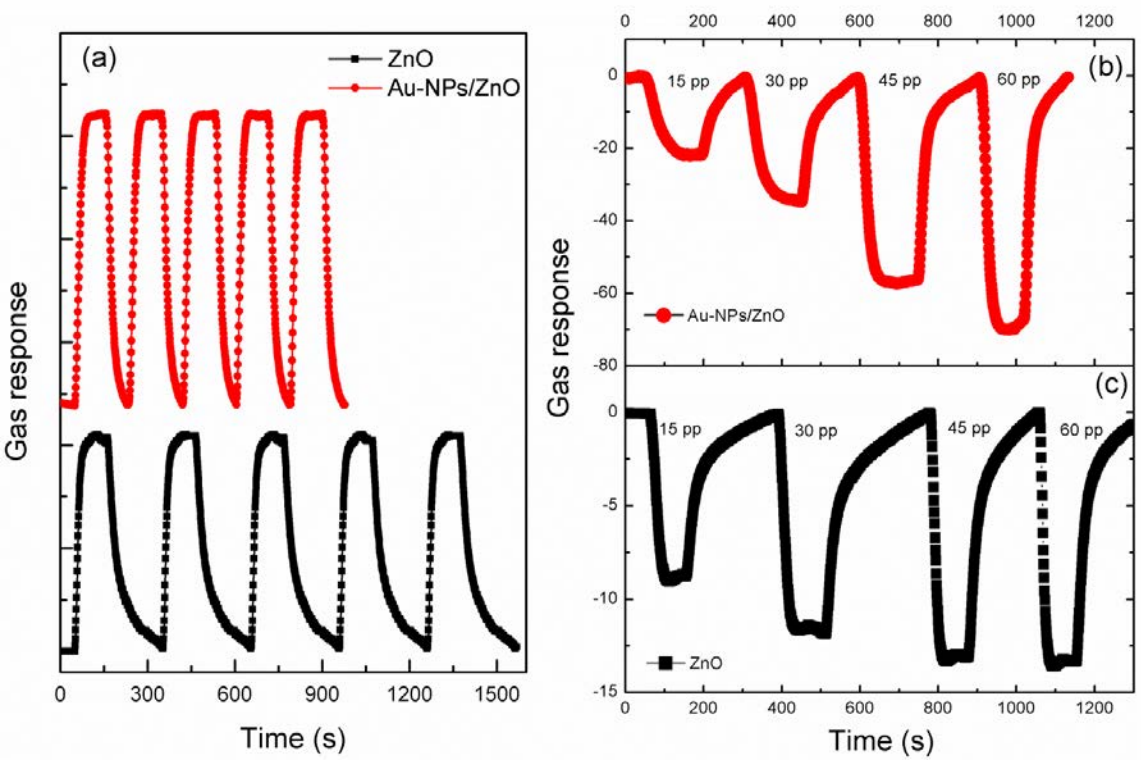

Figure S1: (a) Response cycles of all samples to 10 ppm NO_2 at operating temperature (120 °C); (b) and (c) dynamic transient of resistances in response to *n*-propane (C_3H_8) detection for ZnO and Au-NPs/ZnO sensors at 120 °C, respectively.

II. Photocatalytic degradations

The decoloration percentage which demonstrates the photocatalytic activity of both samples is evaluated by the PL quenching of RhB in the photocatalyst-mixed solution, which is determined by the expression,

$$\text{PL quenching (\%)} = \frac{(I_0 - I(t))}{I_0} \times 100\%$$

where I_o and $I(t)$ are the integrated PL intensity of RhB solution before and after visible light irradiation, respectively.

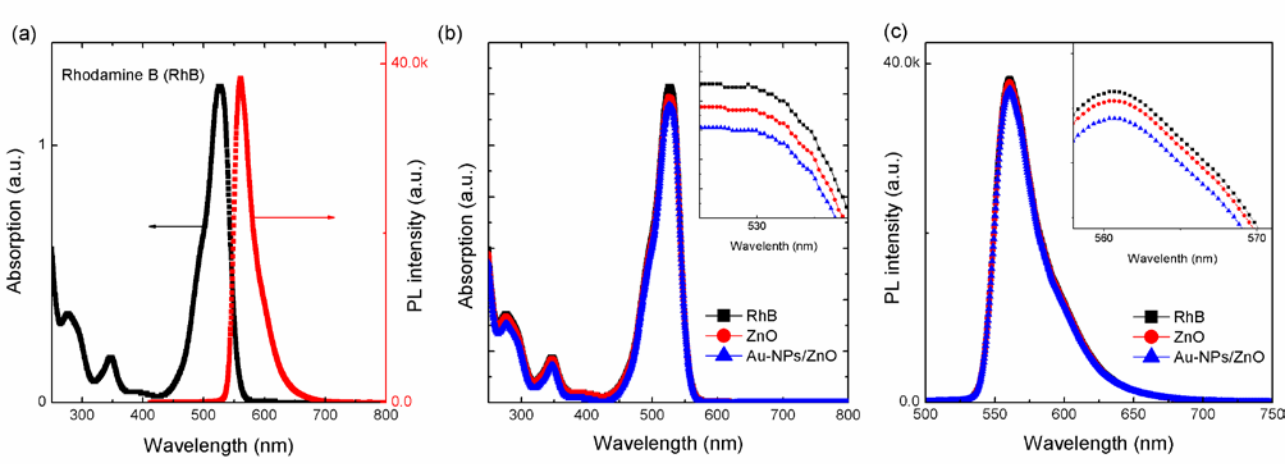

Figure S2: (a) UV–vis absorption and PL spectrum of Rhodamine B (RhB) aqueous solution at room temperature; (b) UV–vis absorption spectra; and (c) PL spectra of all samples, indicating slight decreases in the photo-decomposes even after 40 min (the inset of b and c).

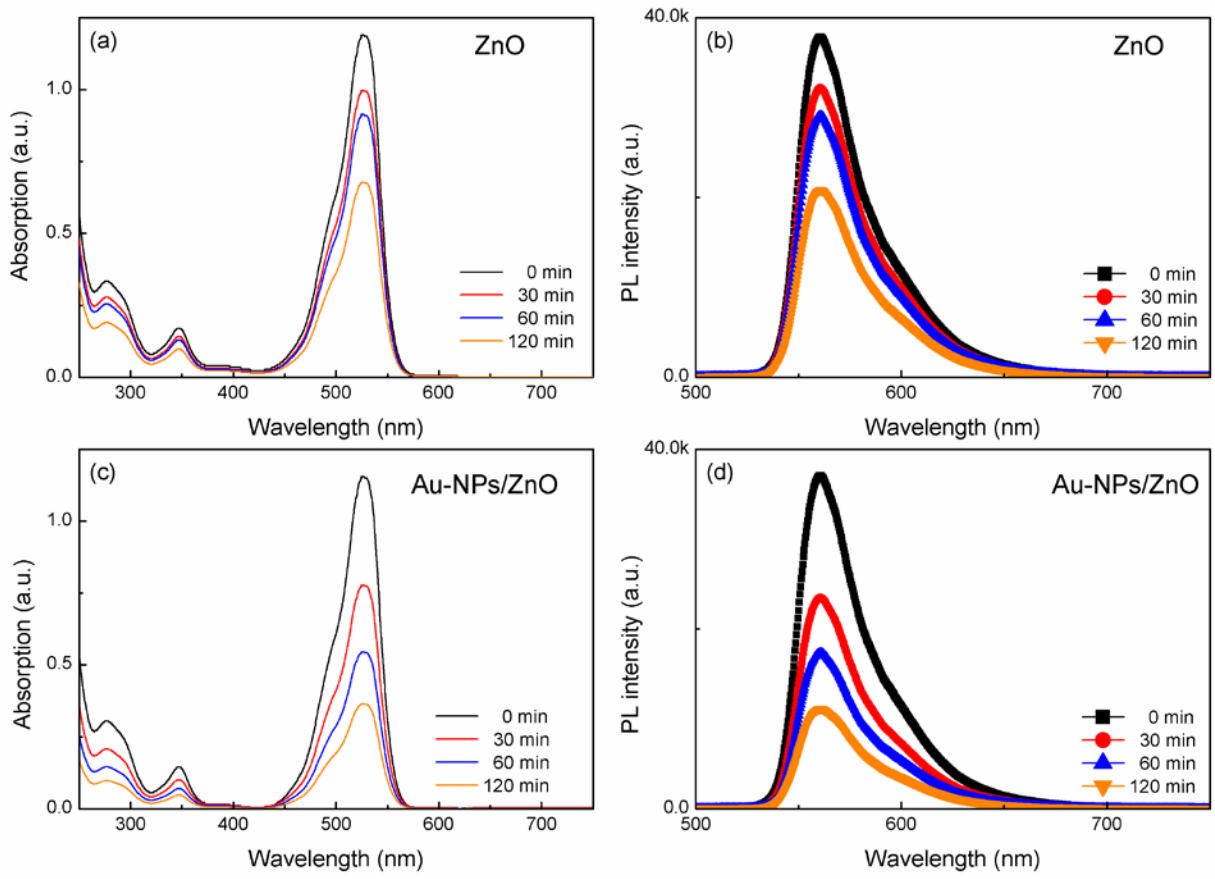

Figure S3: UV–vis absorption and PL spectra of RhB aqueous solution in presence of as-deposited ZnO film (a, b), and ZnO/Au film (c, d), respectively, after different periods of time.