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 NO₂ at operating temperature (120 °C); (b) and (c) dynamic transient of resistances in response to n-propane (C₃H₈) 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,

\[ \text{PL quenching (\%)} = \left( \frac{I_0 - I(t)}{I_0} \right) \times 100\% \]

where \( I_0 \) 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.