

## Electronic Supplementary Information

### The surface plasmon resonance, thermal, support and size effect induced photocatalytic activity enhancement of Au/reduced graphene oxide for selective oxidation of benzylic alcohols

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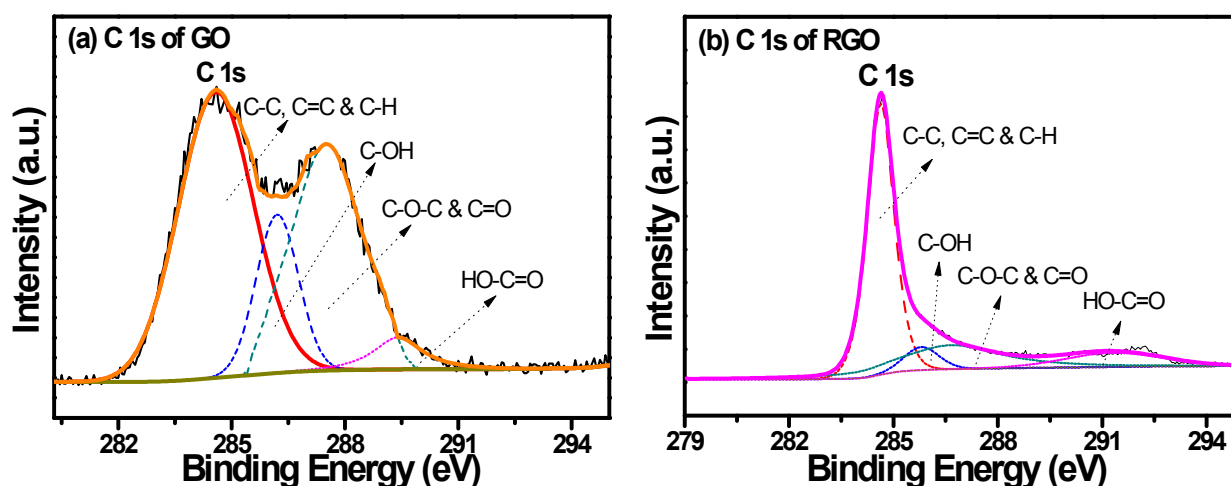
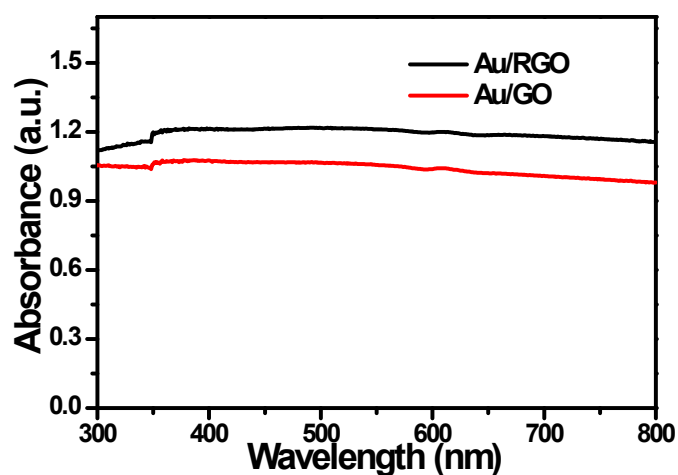


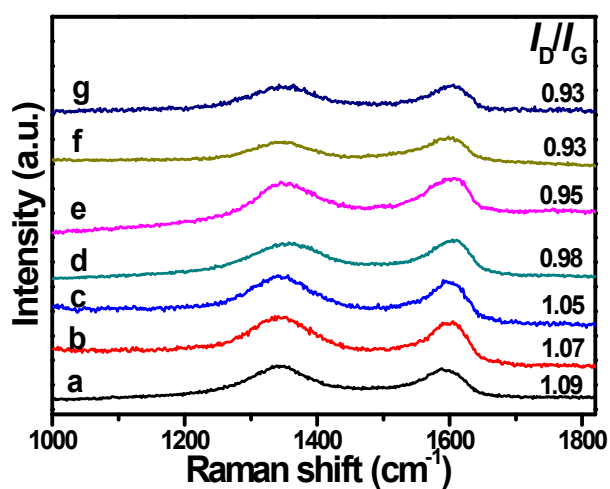
Fig. S1 C 1s XPS spectra of GO (a) and RGO (b).



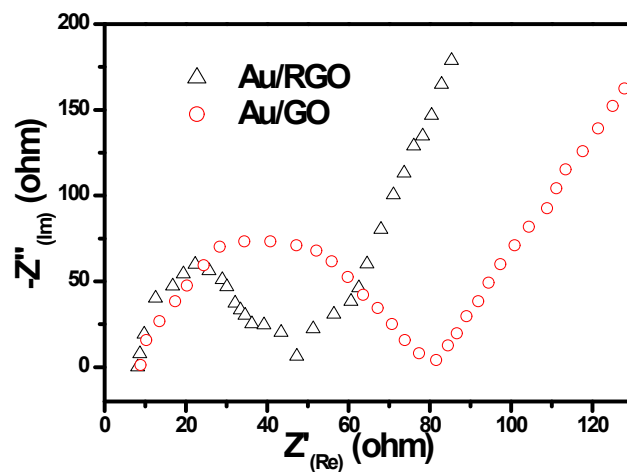
**Fig. S2** UV-vis diffuse reflectance spectra (DRS) of the as-prepared Au/RGO and Au/GO.

**Table S1** Summary of surface area of the as-prepared Au/RGO, Au/GO, Au/SiO<sub>2</sub>, Au/Al<sub>2</sub>O<sub>3</sub>, and Au/SBA-15.

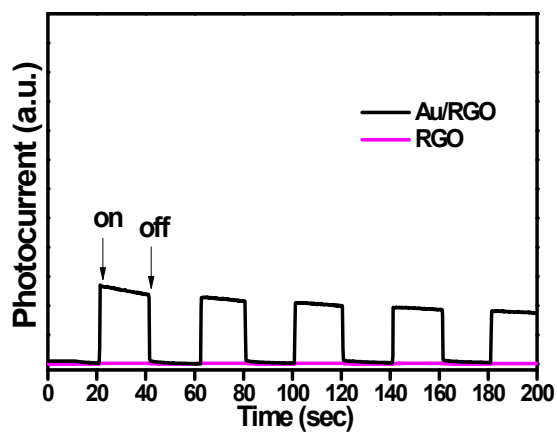
Samples	$S_{\text{BET}}$ (m <sup>2</sup> g <sup>-1</sup> )
Au/RGO	102
Au/GO	96
Au/SiO <sub>2</sub>	1
Au/Al <sub>2</sub> O <sub>3</sub>	1
Au/SBA-15	582



**Fig. S3** Raman spectra of the RGO for different concentration of NaBH<sub>4</sub> 0 M (a), 0.013 M (b), 0.026 M (c), 0.040 M (d), 0.053 M (e), 0.11 M (f), and 0.16 M (g) reduction of GO.



**Fig. S4** Nyquist impedance plots of Au/RGO and Au/GO.



**Fig. S5** Photocurrent transient response of the samples Au/RGO and RGO in a 0.2 M Na<sub>2</sub>SO<sub>4</sub> aqueous solution without bias versus the Ag/AgCl electrode under visible light irradiation.

**Appendix** for illustrating the transfer of charge carriers in Au/RGO under visible light.

