

Supplementary Information of

Modification of TiO₂ by Bimetallic Au-Cu Nanoparticles for Wastewater Treatment

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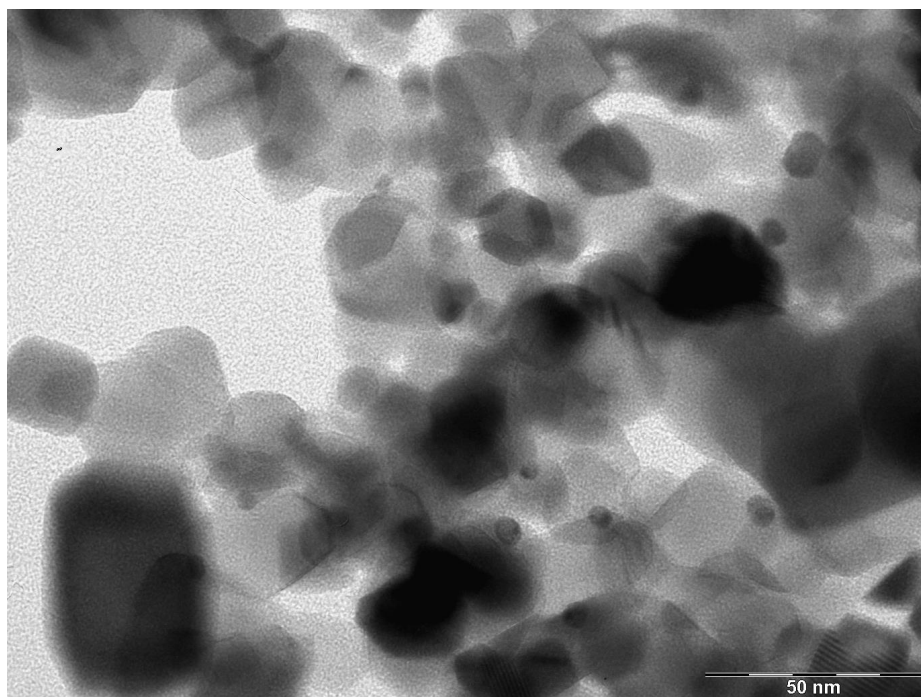


Figure S1. TEM image of AuCu1:3/P25 by the chemical method with THPC.

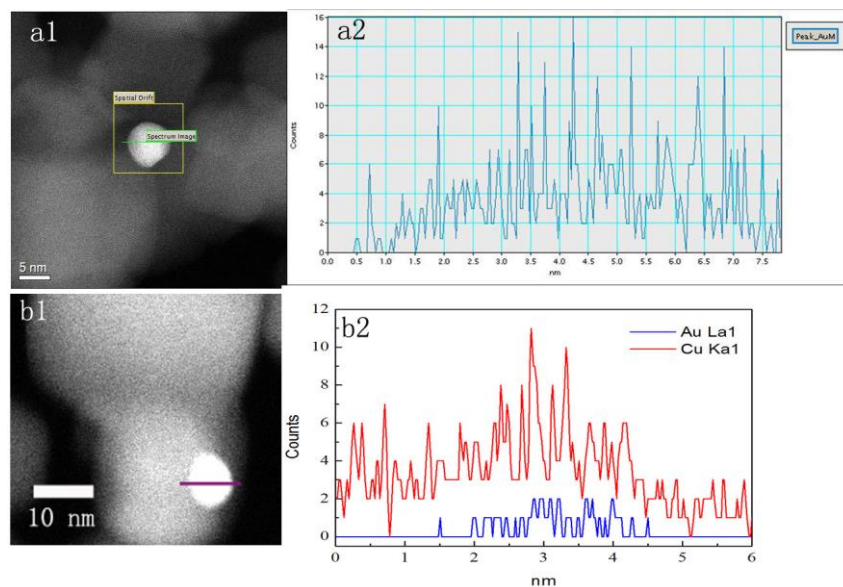


Figure S2. Energy dispersive X-ray spectroscopy line scans across external nanowires of nanoparticles (profiles were taken along the green line) and corresponding STEM images for the samples of (a) Au/P25, (b) AuCu1:3/P25. The blue line corresponds to CuK and the red one to AuL signal.

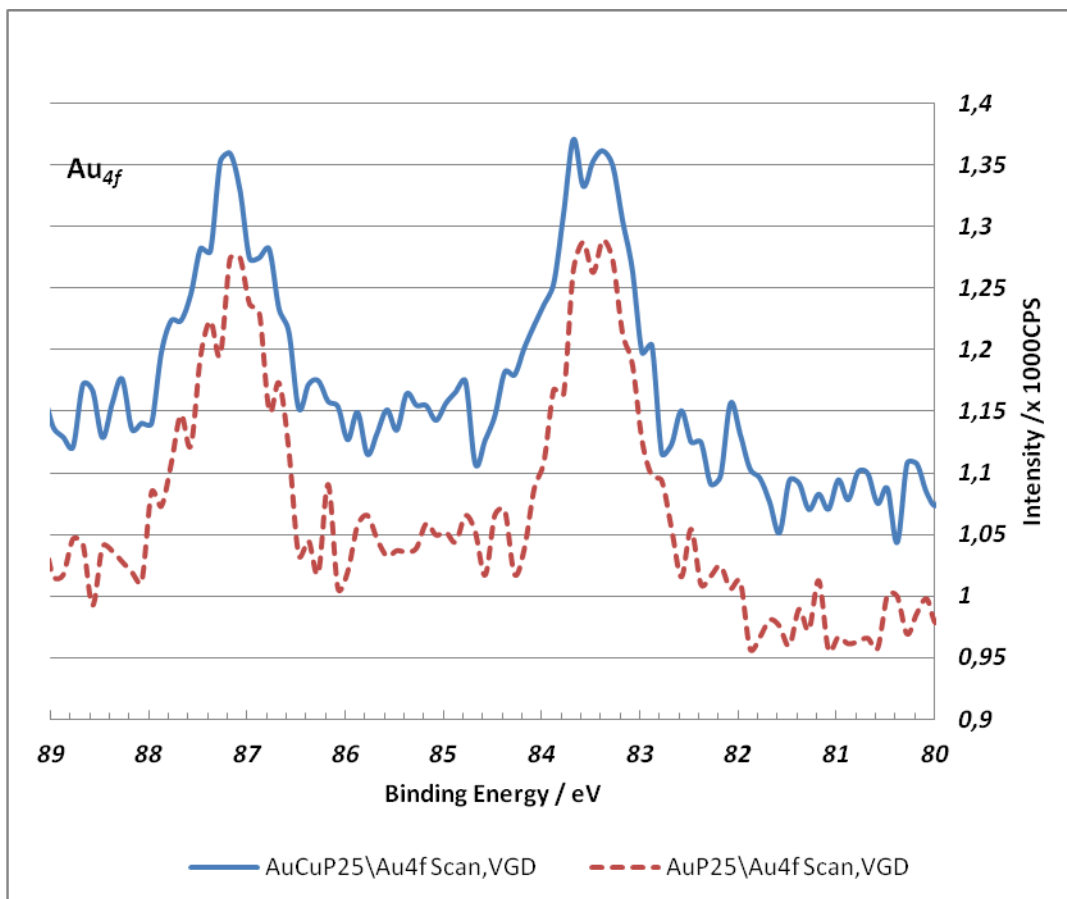


Figure S3. Au_{4f} region of the XPS spectra of the sample AuCu1:1/P25 (blue) and Au/P25 (red).

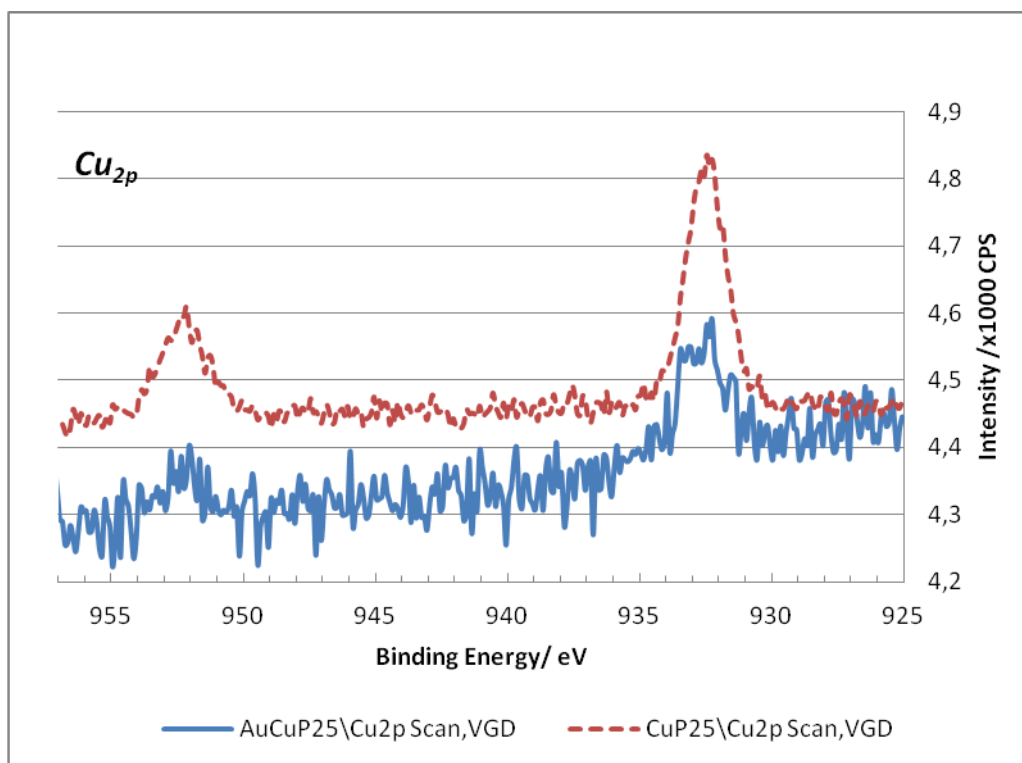


Figure S4. Cu_{2p} region of the XPS spectra of the sample AuCu1:1/P25 (blue) and Cu/P25 (red).

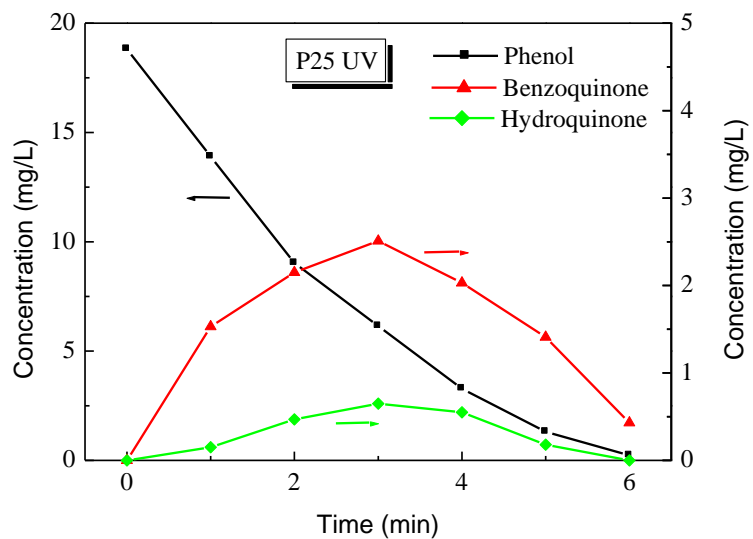


Figure S5. Photodegradation of Phenol by the photocatalyst of P25 under UV illumination. The initial concentration of Phenol is 2×10^{-4} M, which is equal to 18.82 ppm.

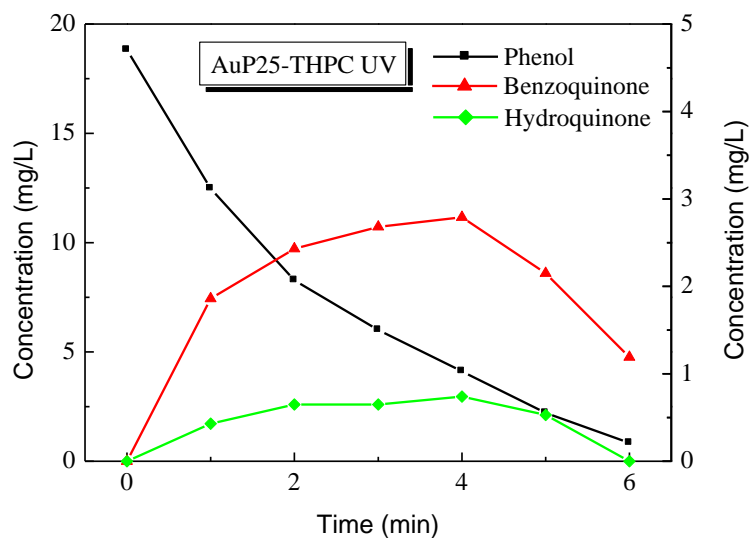


Figure S6. Photodegradation of Phenol by the photocatalyst of Au/P25 under UV illumination. The initial concentration of Phenol is 2×10^{-4} M, which is equal to 18.82 ppm.

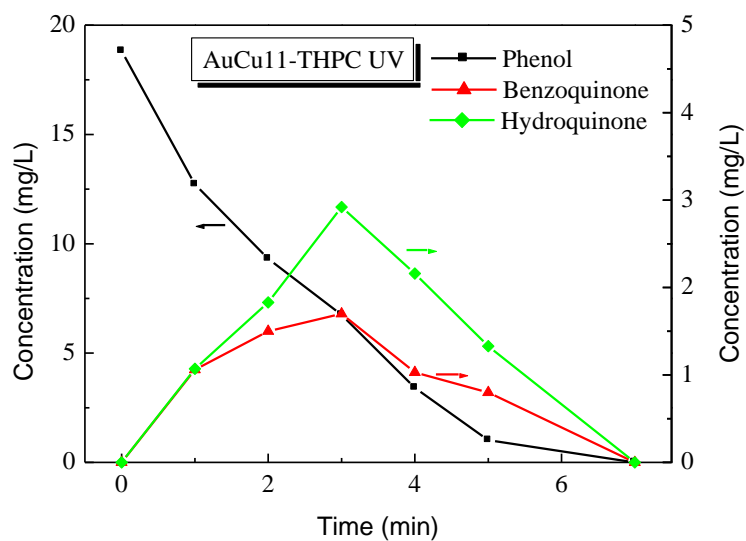


Figure S7. Photodegradation of Phenol by the photocatalyst of AuCu1:1/P25 under UV illumination. The initial concentration of Phenol is 2×10^{-4} M, which is equal to 18.82 ppm.

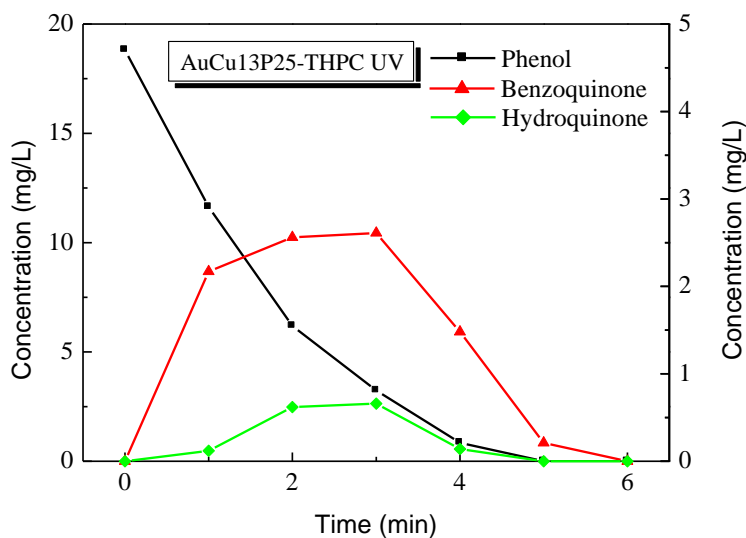


Figure S8. Photodegradation of Phenol by the photocatalyst of AuCu1:3/P25 under UV illumination. The initial concentration of Phenol is 2×10^{-4} M, which is equal to 18.82 ppm.

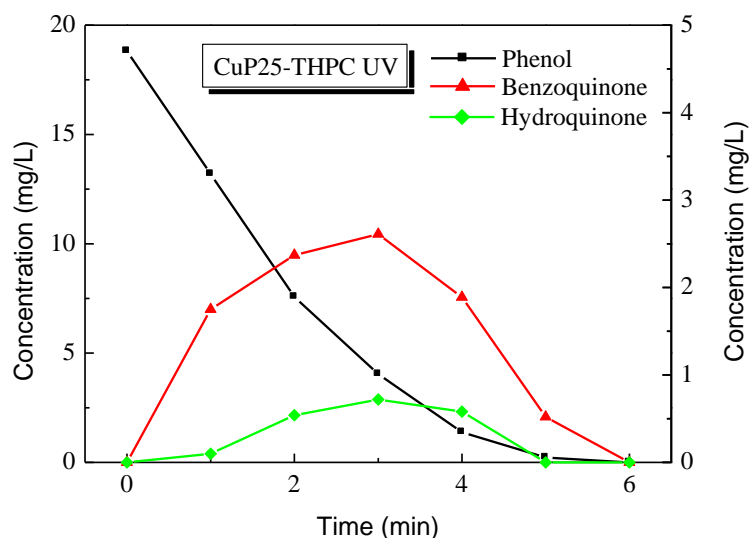


Figure S9. Photodegradation of Phenol by the photocatalyst of Cu/P25 under UV illumination. The initial concentration of Phenol is 2×10^{-4} M, which is equal to 18.82 ppm.

TABLE S1. Rate constants of the first-order reaction of Phenol photodegradation

Samples	K (rate constant) (10^{-3} s^{-1})	R (correlation coefficient)	B (intercept) (s)
P25	0.0086 ± 0.0009	0.979	0.19 ± 0.16
Au/P25	0.0089 ± 0.0007	0.980	0.14 ± 0.16
AuCu1:1/P25	0.0111 ± 0.0012	0.976	0.27 ± 0.23
AuCu1:3/P25	0.0125 ± 0.0015	0.978	0.20 ± 0.22
Cu/P25	0.0107 ± 0.0013	0.980	0.20 ± 0.19

These values are obtained by the ORIGIN 6.0 based on the data of photodegradation of Phenol. The data of $\ln(C_t/C_0)$ versus time were simulated by linear fit without crossing through the zero mandatorily.

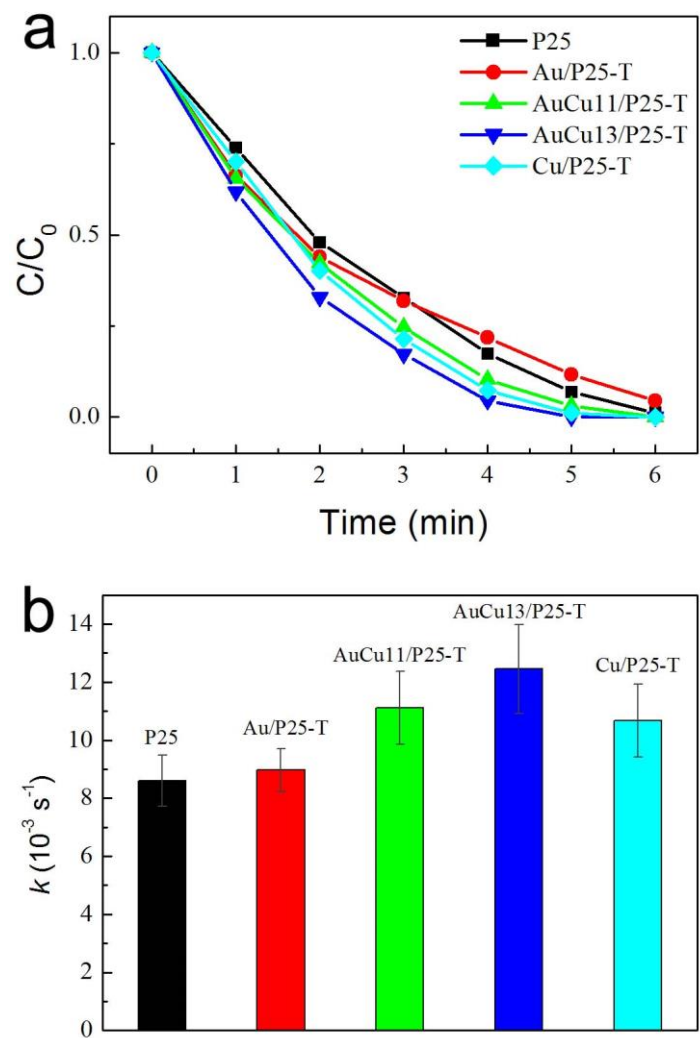


Figure S10. (a) The time courses of phenol relative concentration in photodegradation under UV illumination with pure P25, and modified P25 without thermal treatment, **(b)** the rate constants of the corresponding photodegradation.