

Supporting Information:

**Light-induced Efficient Molecular Oxygen Activation on Cu(II)
Grafted TiO₂/graphene Photocatalyst for Phenol Degradation**

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(9 Figures, 1 Table, 6 Pages)

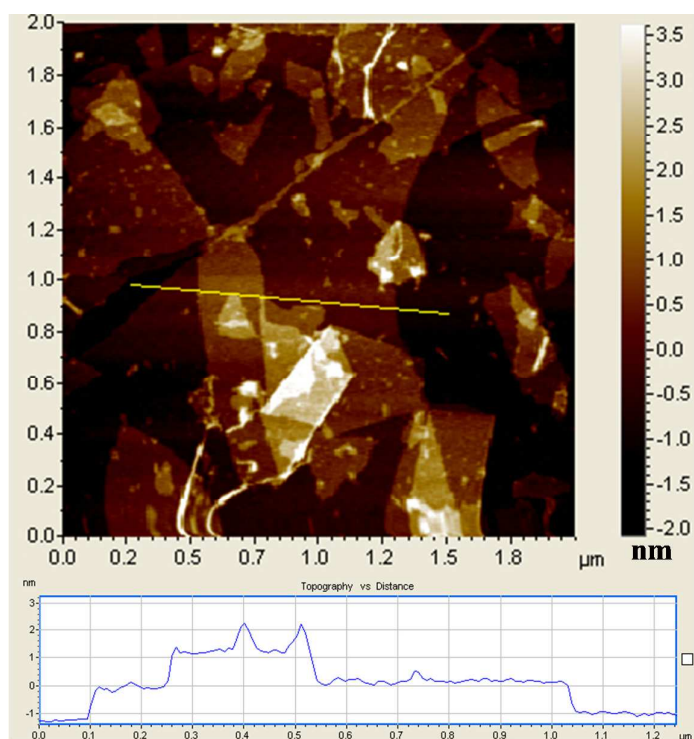


Figure S1. Atomic force microcopy images of graphene oxide sheets.

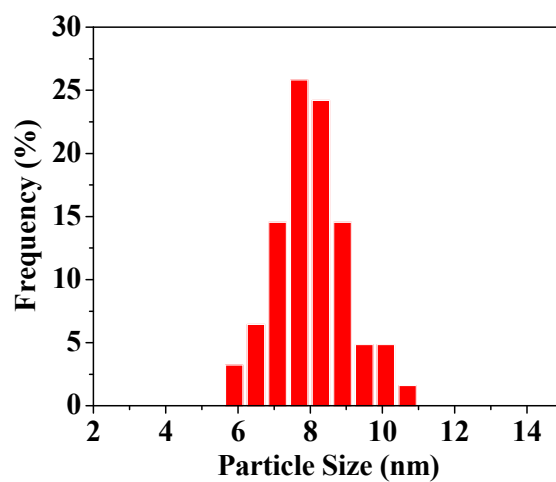


Figure S2. The statistical data of the TiO_2 NPs size in the $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$ composites.

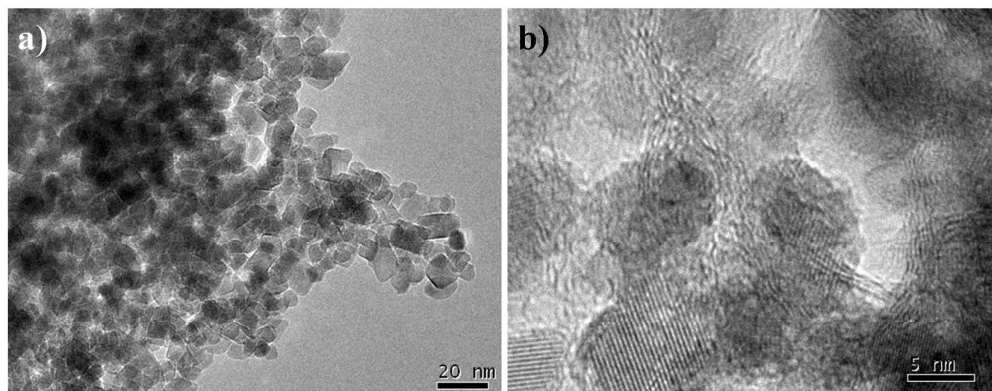


Figure S3. (a) TEM and (b) High-resolution TEM images of the TiO_2/RGO composites.

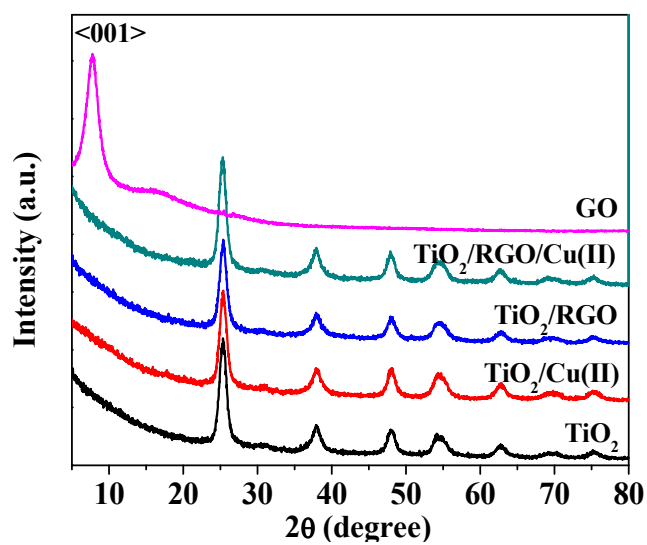


Figure S4. XRD patterns of GO, TiO_2 , $\text{TiO}_2/\text{Cu(II)}$, TiO_2/RGO and $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$ composites.

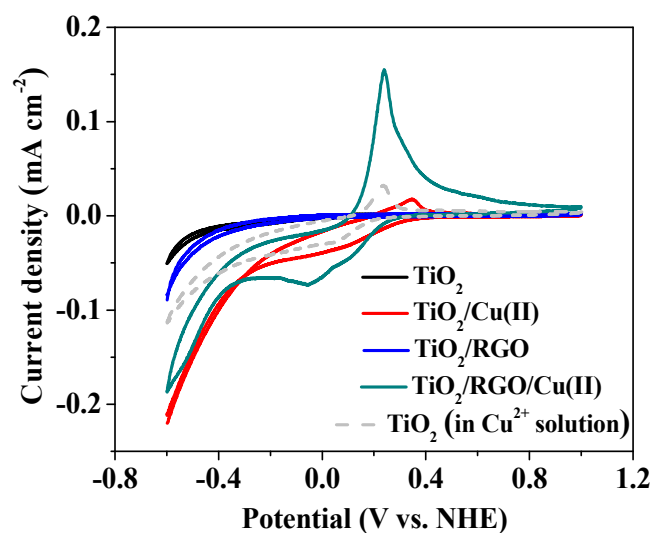


Figure S5. Cyclic voltammograms of the prepared TiO_2 , $\text{TiO}_2/\text{Cu(II)}$, TiO_2/RGO and $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$ electrodes in NaClO_4 electrolyte solution. The gray dashed line represents the cyclic voltammograms of the bare TiO_2 electrode in 0.2 mM CuCl_2 solution.

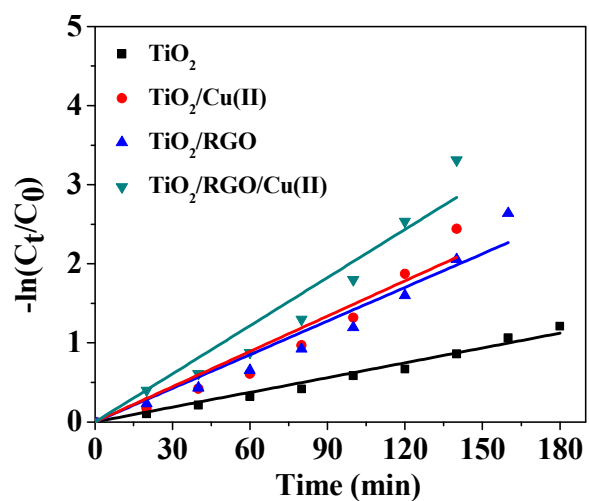


Figure S6. The calculation of phenol degradation rate constants for the TiO_2 , $\text{TiO}_2/\text{Cu(II)}$, TiO_2/RGO and $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$ composites with R square of 0.99, 0.98, 0.98 and 0.97, respectively.

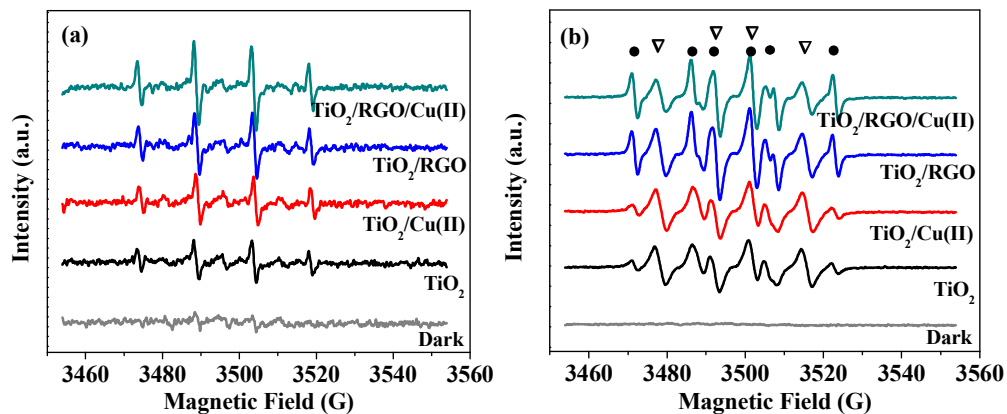


Figure S7. Electron spin resonance spectra of radical adducts trapped by DMPO in TiO_2 , $\text{TiO}_2/\text{Cu(II)}$, TiO_2/RGO and $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$ dispersions after 10 min UV irradiation: (a) $\text{DMPO}-\cdot\text{OH}$ formed in aqueous dispersions and (b) $\text{DMPO}-\cdot\text{O}_2^-$ formed in methanol suspensions ($\text{DMPO}-\cdot\text{O}_2^-$ and methyl radical were marked with ∇ and $\bullet$ symbols, respectively).

Table S1. BET surface area of TiO_2 , $\text{TiO}_2/\text{Cu(II)}$, TiO_2/RGO and $\text{TiO}_2/\text{RGO}/\text{Cu(II)}$.

Sample	TiO_2	$\text{TiO}_2/\text{Cu(II)}$	TiO_2/RGO	$\text{TiO}_2/\text{RGO}/\text{Cu(II)}$
BET surface area m^2/g	152.3	145.2	155.7	156.8

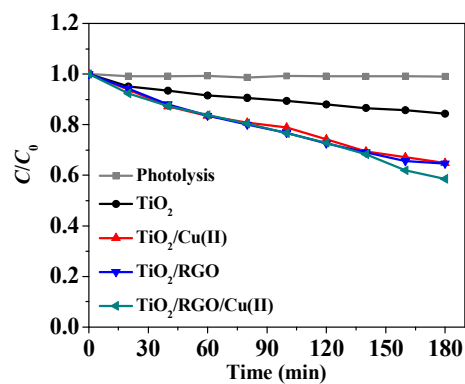


Figure S8. Phenol degradation curves under visible light irradiation ($\lambda > 400$ nm) over TiO₂, TiO₂/Cu(II), TiO₂/RGO and TiO₂/RGO/Cu(II) composites.

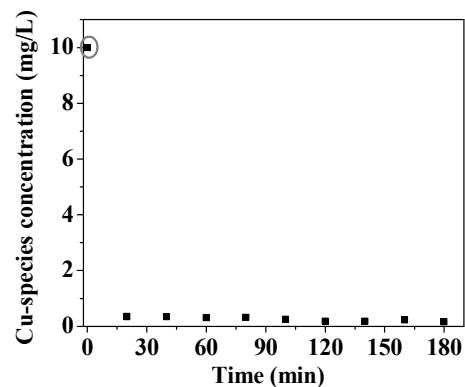


Figure S9. Change of Cu-species concentration in the TiO₂/RGO/Cu(II) composites suspension during light irradiation. The Cu-species concentration at $t = 0$ min was calculated to be 10 mg/L by assuming that Cu(II) in the composites was completely dissolved.