Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Effect of the Cu dopants on the Electron Transfer to O_2 and the Connection with the Photocatalysis over Nano-TiO_2

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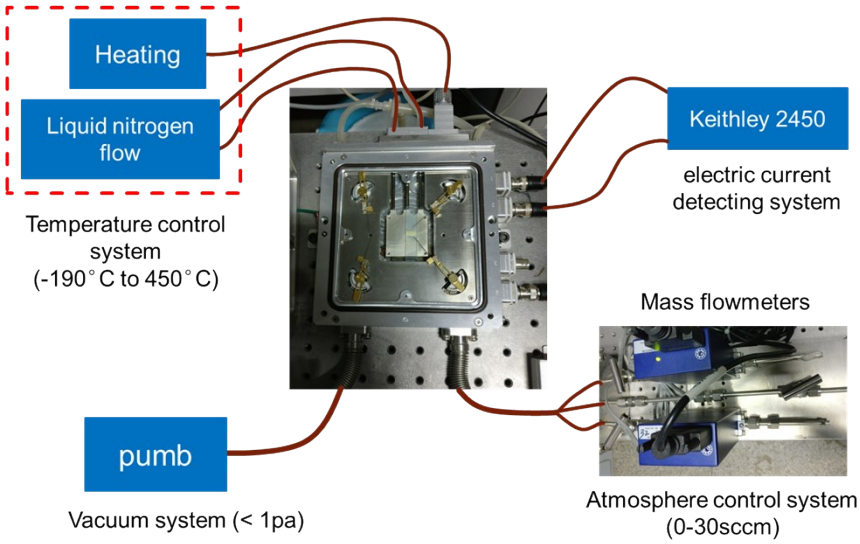

Fig. S1 Experimental setup for photoconductance and transient photoconductance measurement

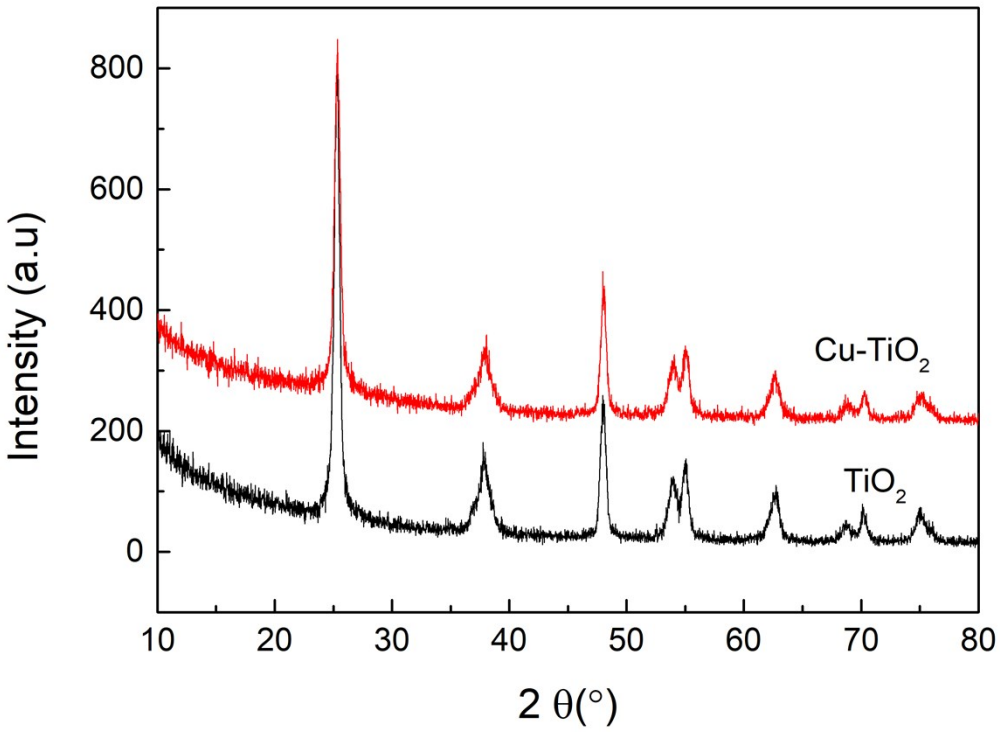

Fig. S2 XRD patterns of the undoped and Cu-doped TiO_2 samples.

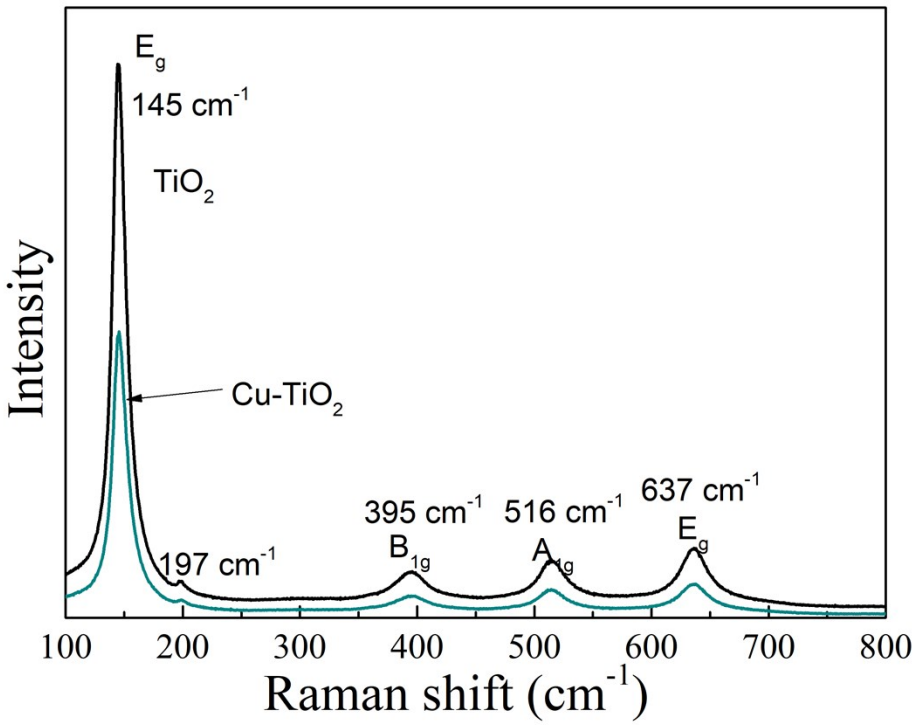

Fig. S3 Raman scattering patterns of the undoped and Cu-doped TiO_2 samples, and the magnification of E_g peak at 145 cm^{-1} is shown in right-top corner.

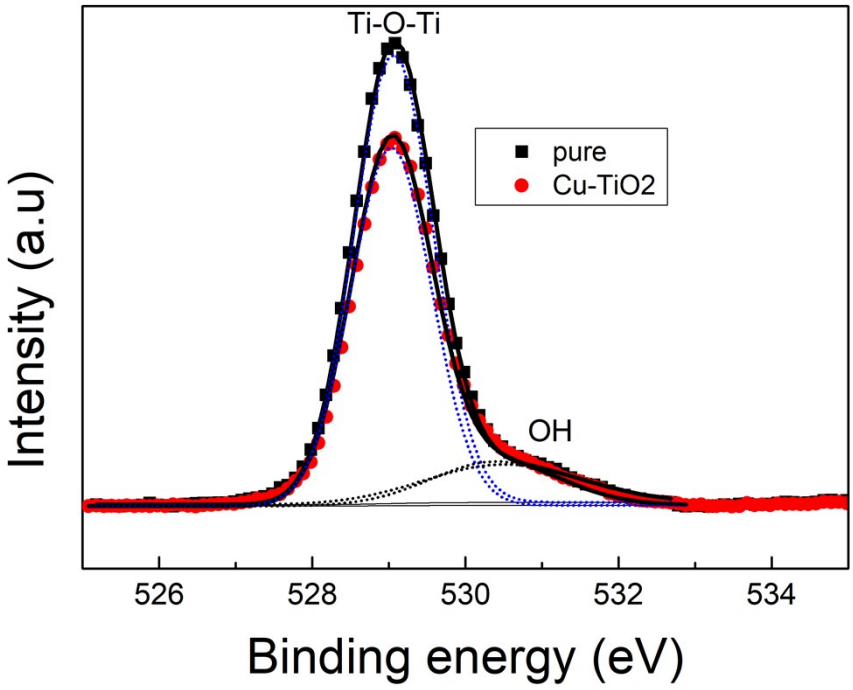

Fig. S4 O1s core-level XPS spectra of the pure and 0.2 Cu-TiO_2

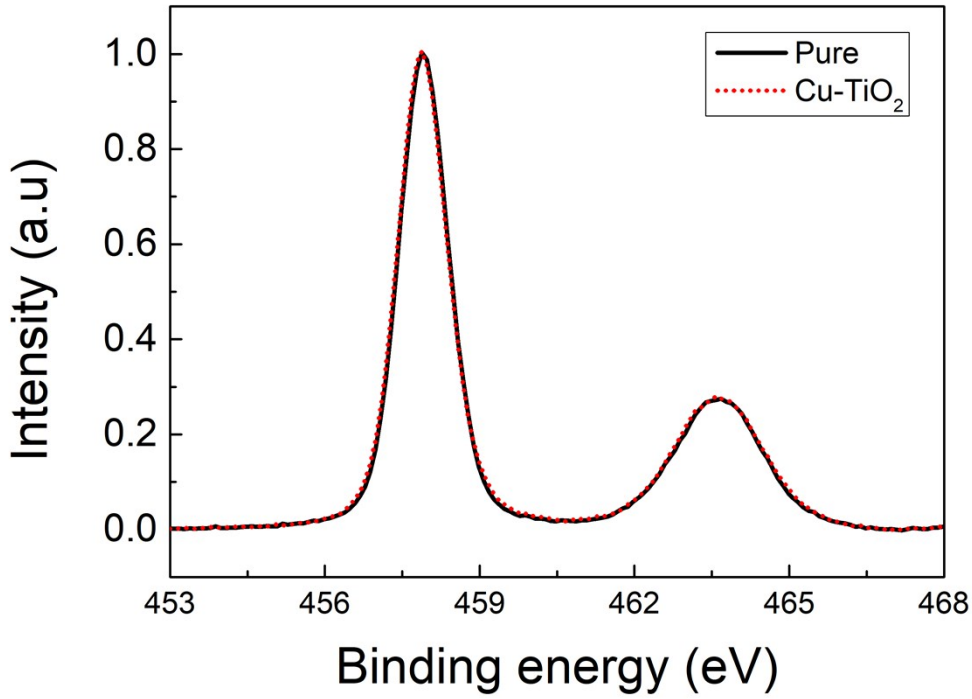

Fig. S5 Ti2p core-level XPS spectra of the pure and 0.2Cu-TiO_2

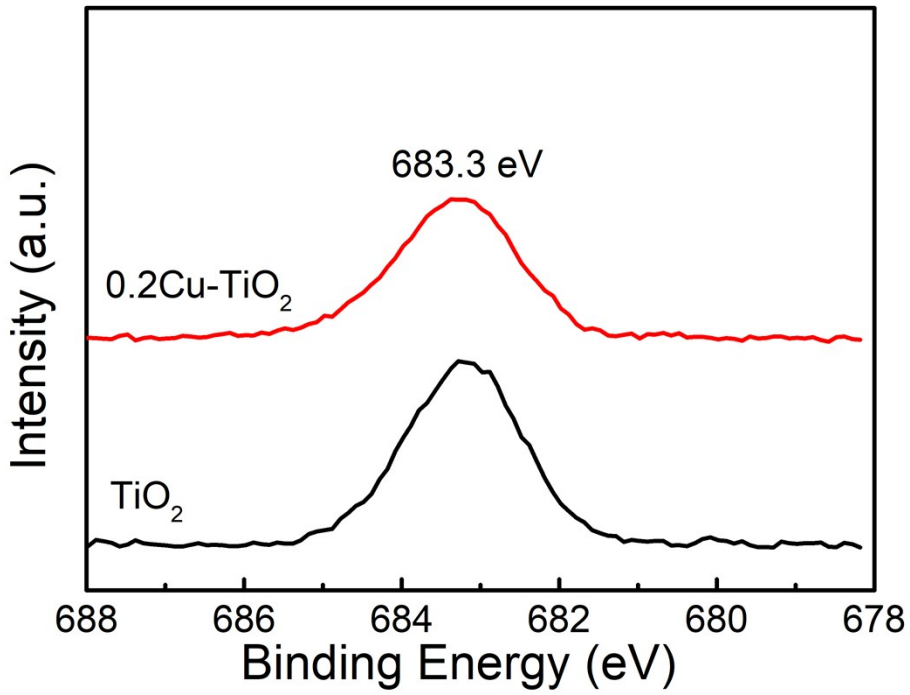

Fig. S6 F1s high-resolution core-level XPS spectra of the pure and 0.2Cu-TiO_2

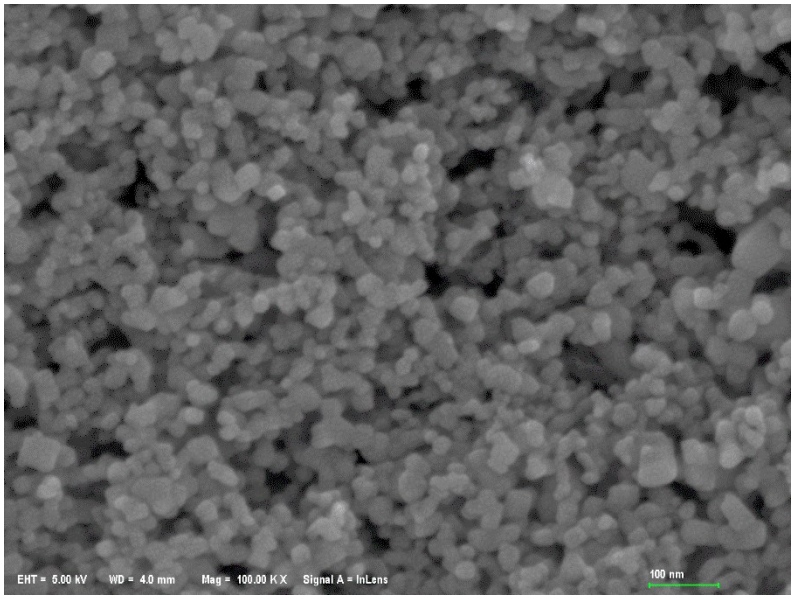

Fig. S7 SEM image of the undoped TiO_2 sample

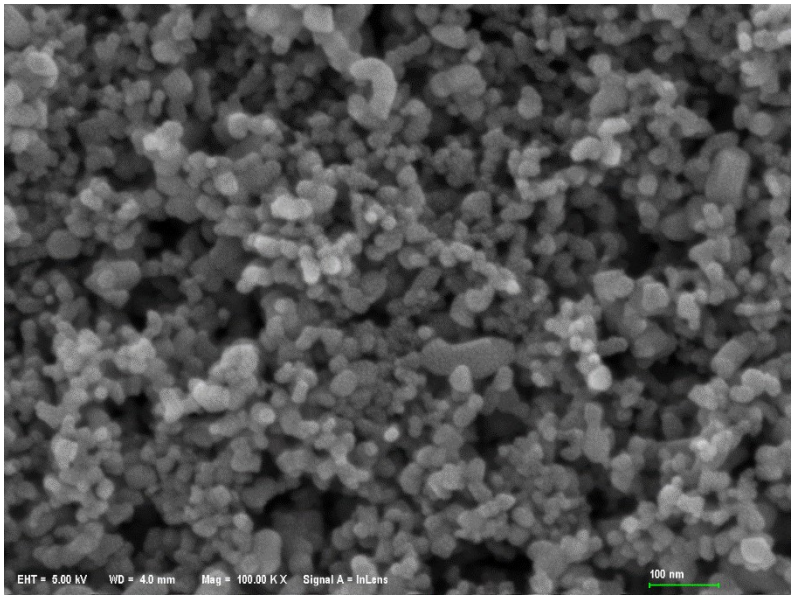

Fig. S8 SEM image of the Cu-doped TiO_2 sample

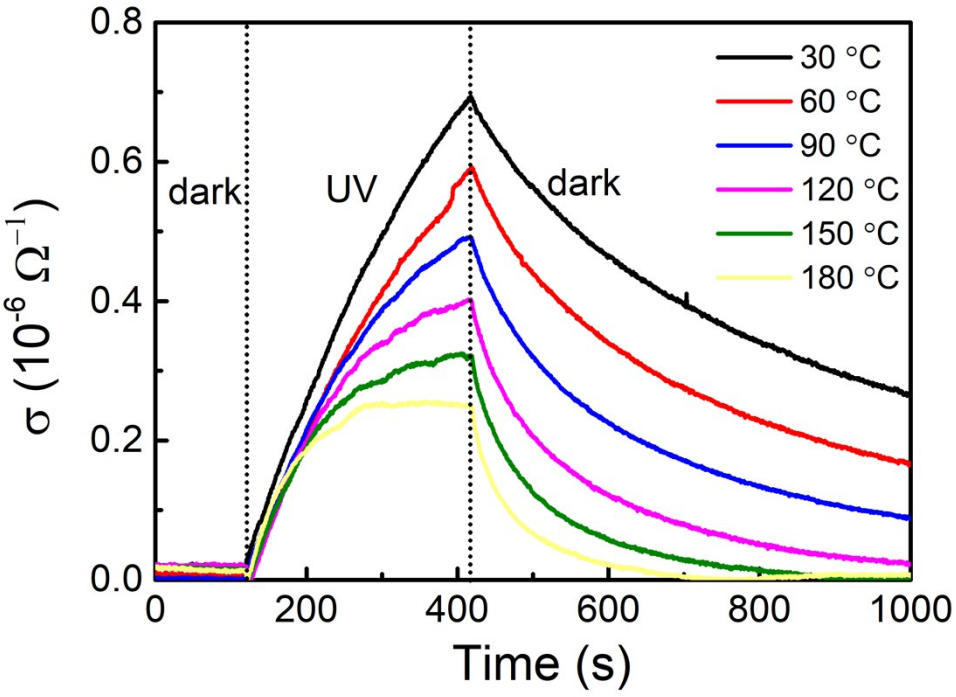

Fig. S9 Vacuum photoconductances of the undoped TiO_2 measured at different temperatures and at 1.0 Pa O_2 partial pressure under 20 mW/cm^2 365 nm UV light illumination.

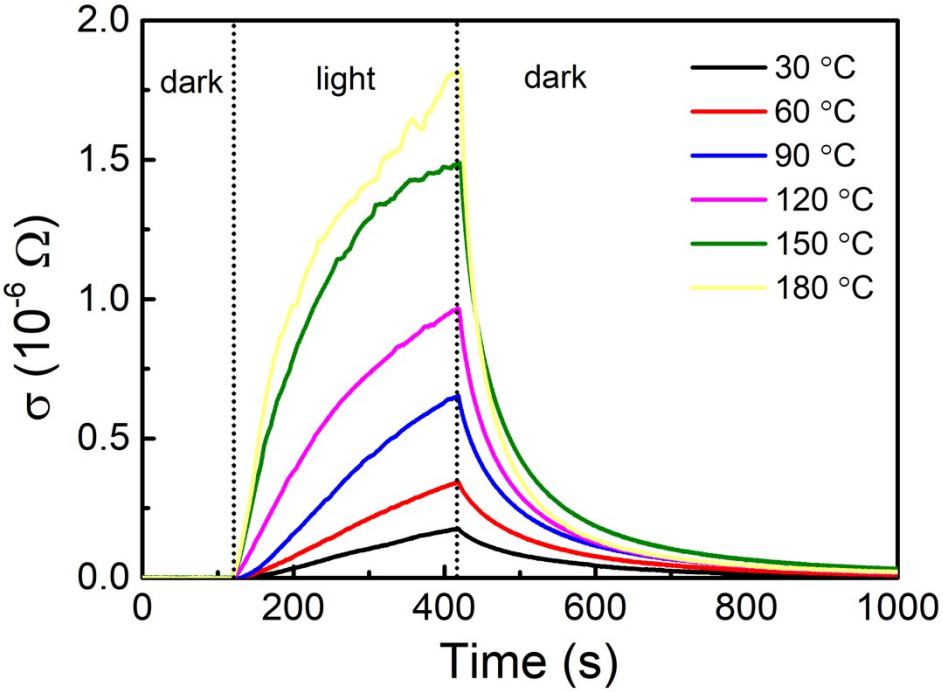

Fig. S10 Vacuum photoconductances of 0.2Cu-TiO_2 measured at different temperatures and at 1.0 Pa O_2 partial pressure under 20 mW/cm^2 365 nm UV light illumination

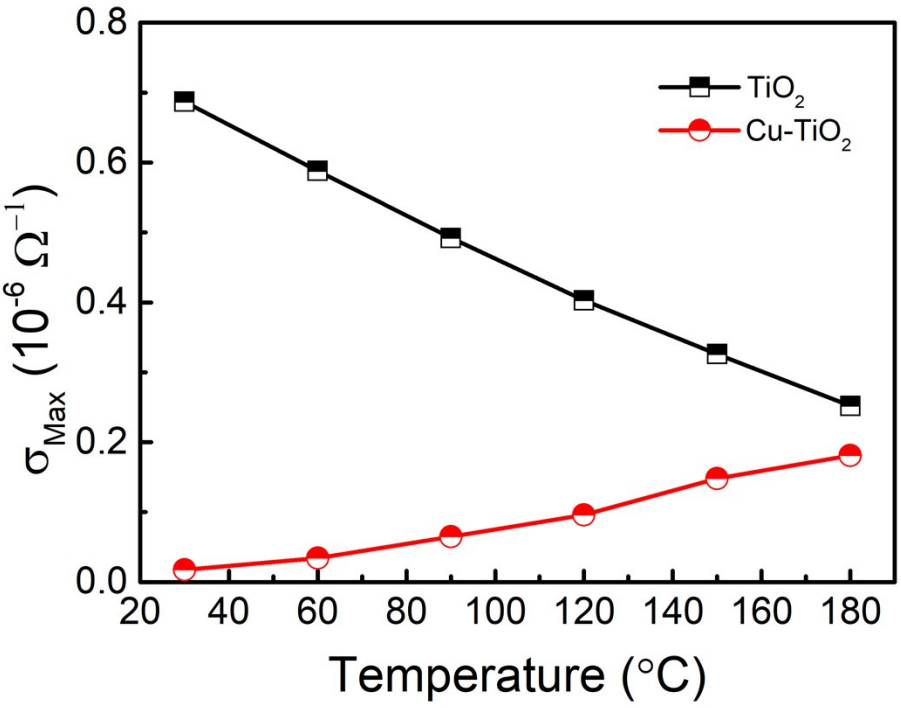

Fig. S11 Relation between the maxima of photoconductances and temperatures for the undoped TiO_2 and 0.2 Cu-TiO_2.

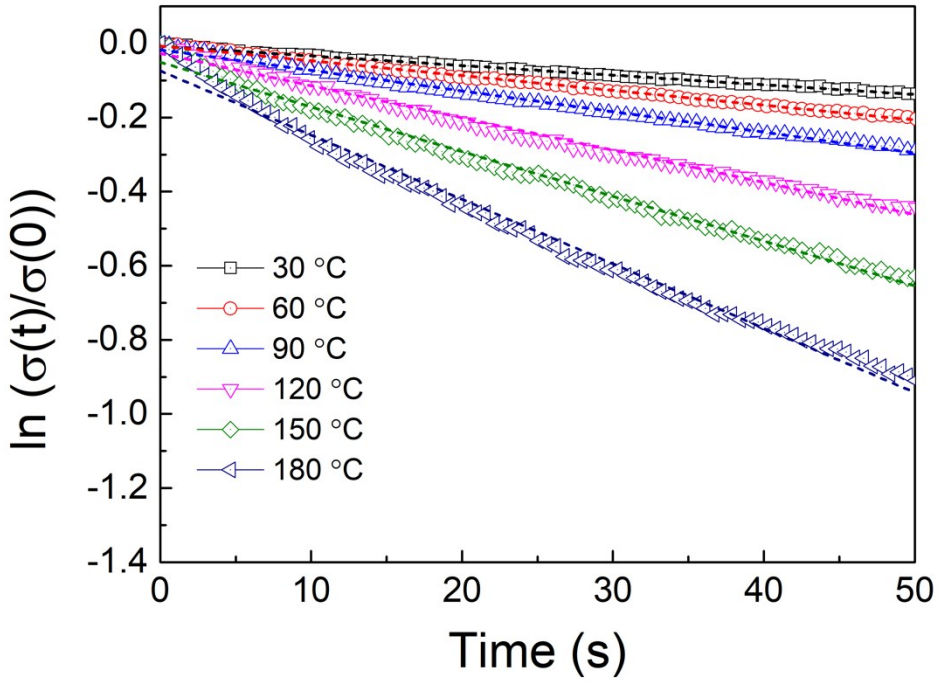

Fig.S12 Dependences of ln (σ(t)/σ(0)) on time for the undoped sample at different temperatures

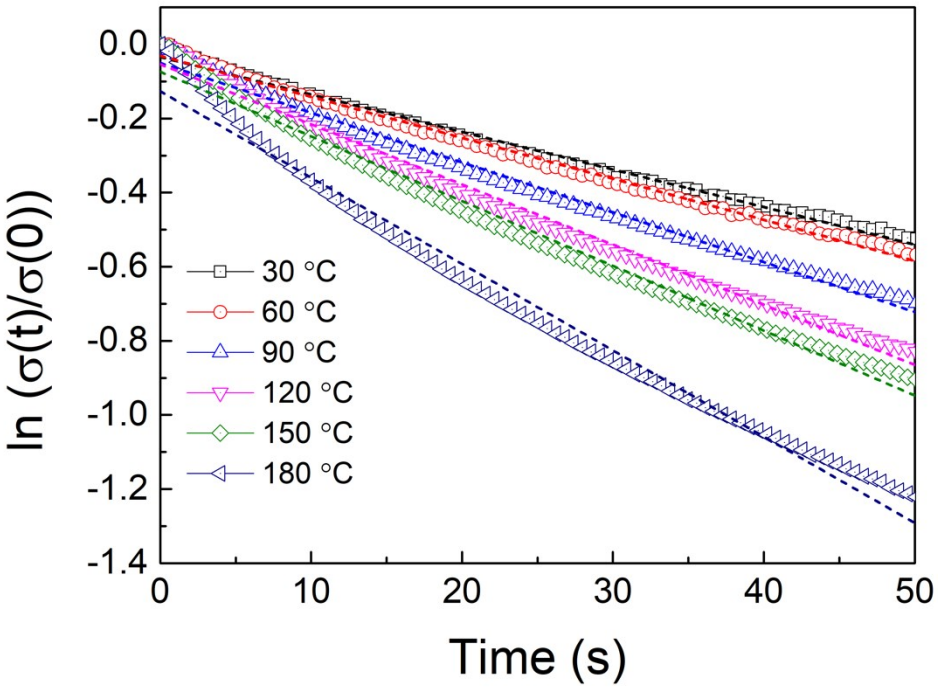

Fig. S13 Dependences of ln (σ(t)/σ(0)) on time for the 0.2 Cu-TiO_2 at different temperatures;

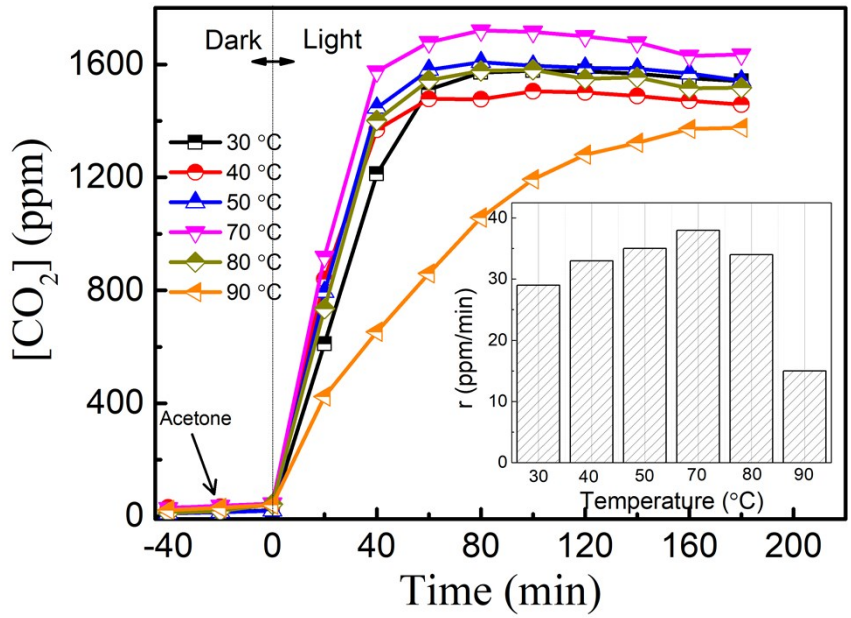

Fig. S14. CO_2 evolution during the acetone photocatalytic oxidations over the pure TiO_2 at different temperatures under 20 mW/cm^2 365 nm UV light illumination.

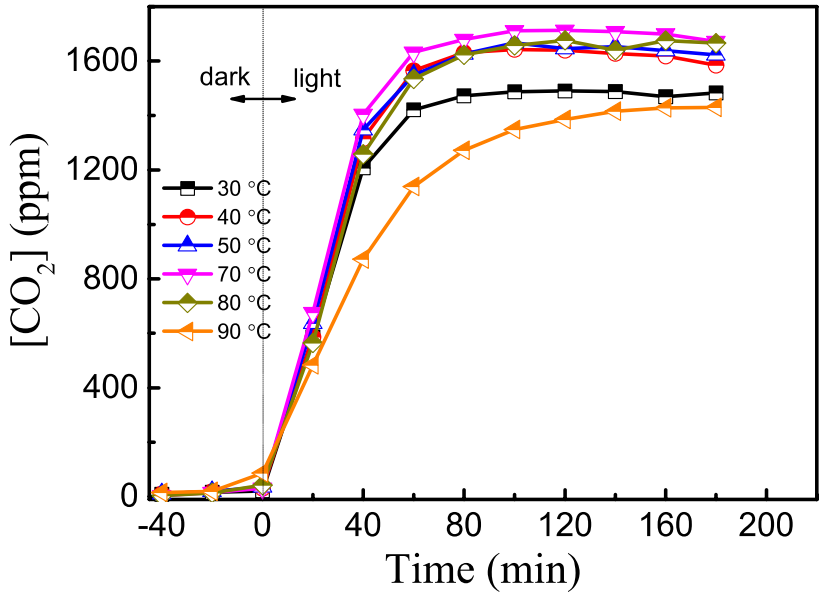

Fig. S15 CO_2 evolutions during the acetone photocatalytic oxidations over the undoped TiO2 at different temperatures under 20 mW/cm^2 365 nm UV light illumination

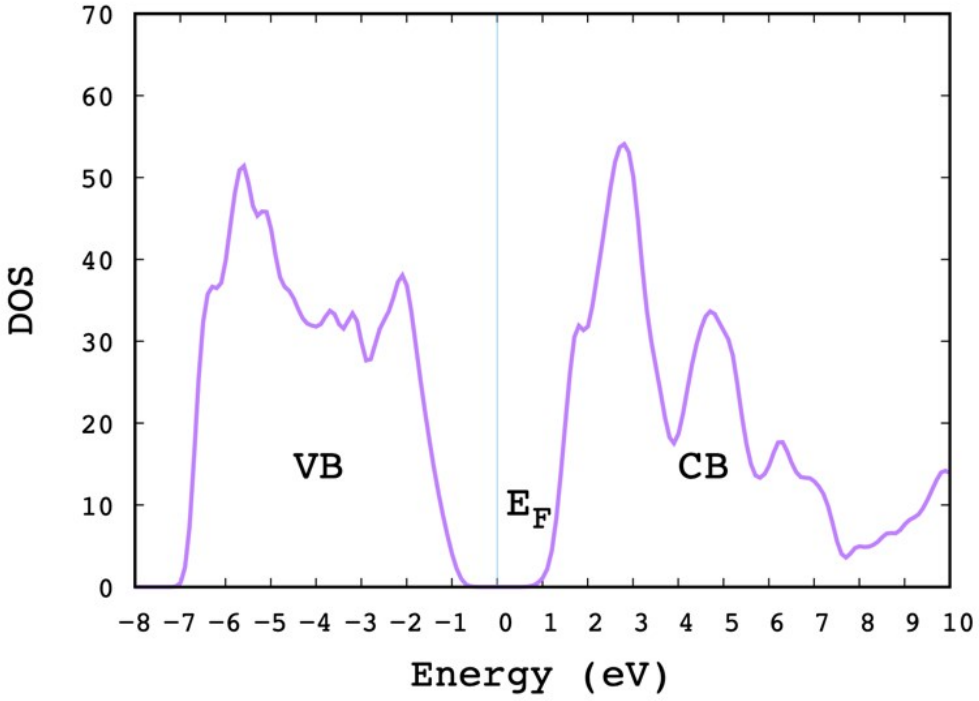

Fig. S16 DOS of the pure bulk TiO_2

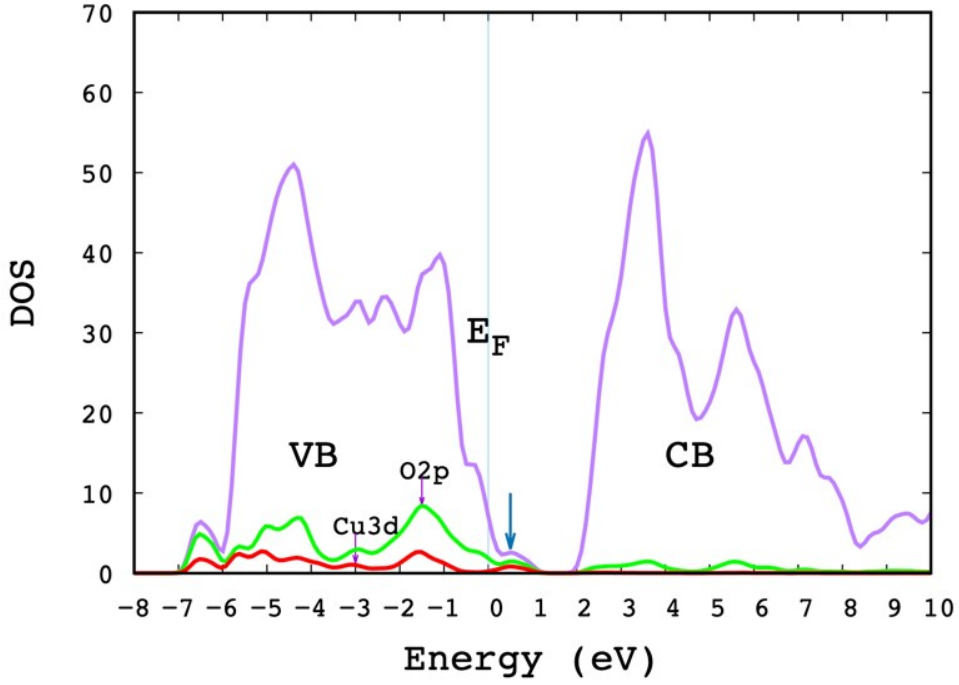

Fig. S17 DOS of the Cu doped bulk TiO_2

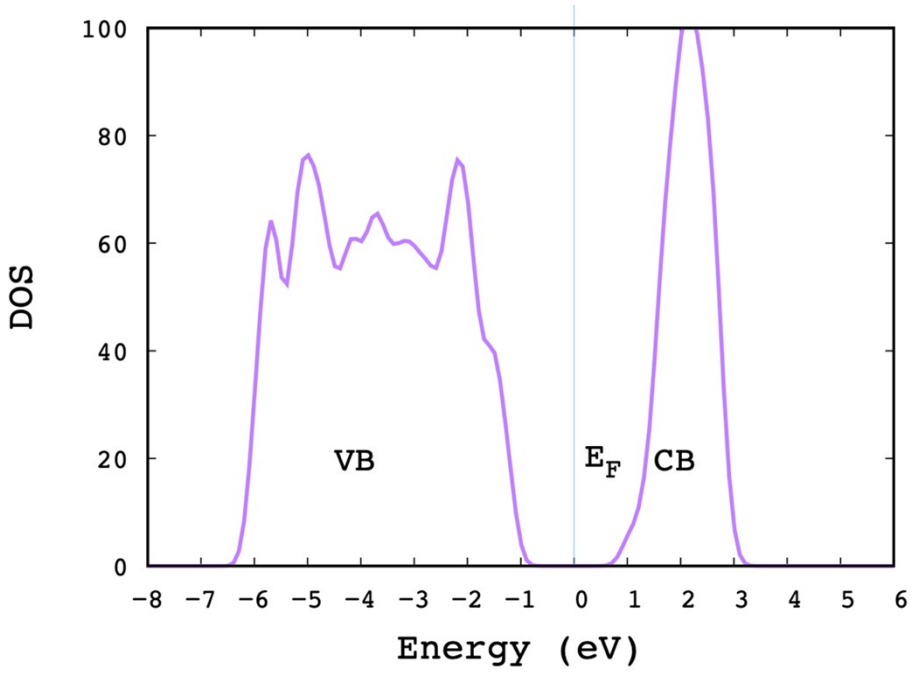

Fig. S18 DOS of the pure TiO_2 (101) surface

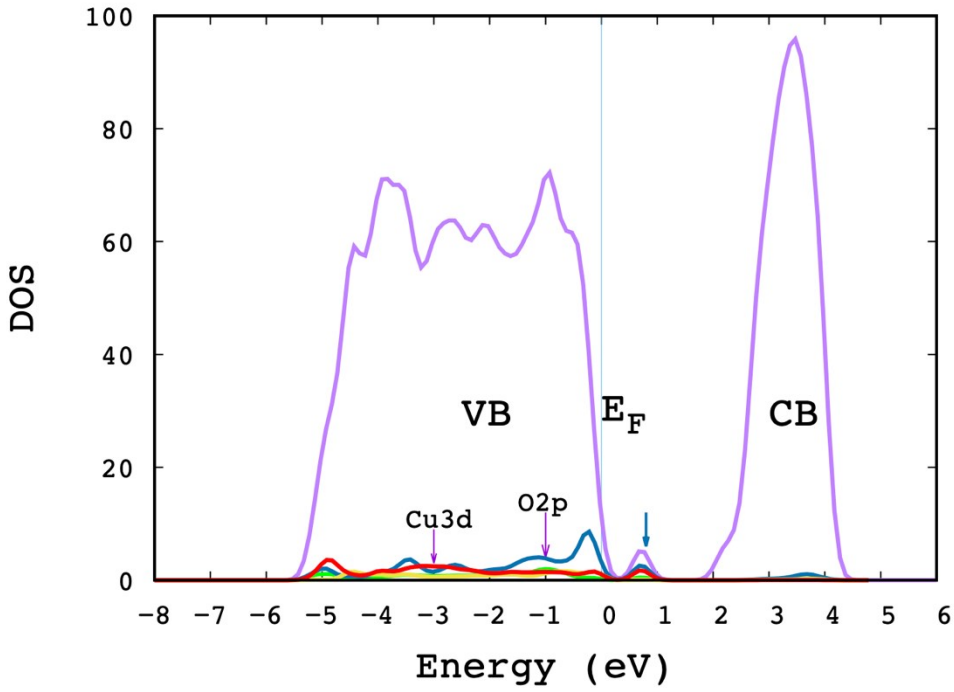

Fig. S19 DOS of and the Cu-doped TiO_2 (101) surface